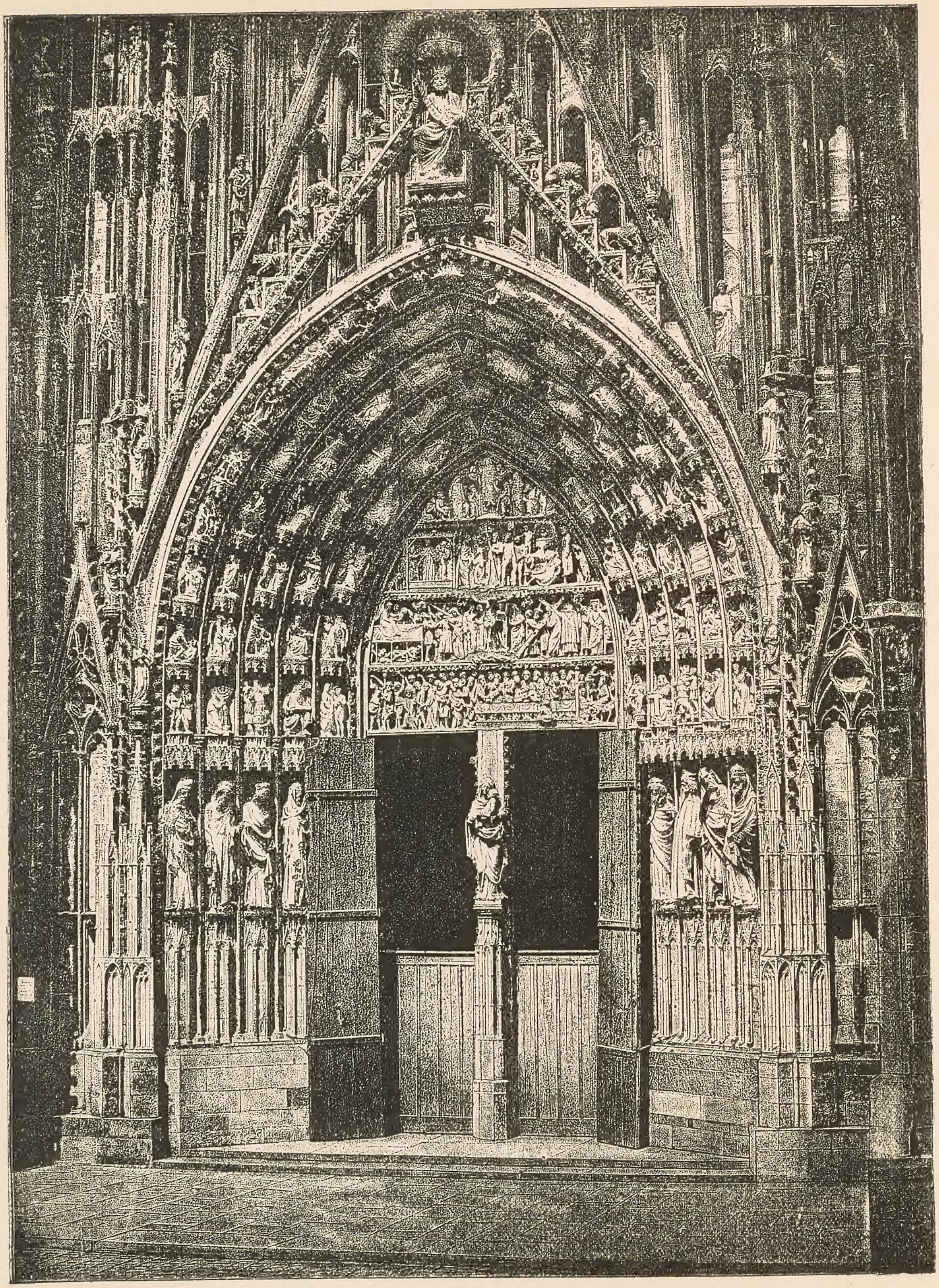

PORCH OF STRASBOURG CATHEDRAL,

PHOTOGRAPHED FROM NATURE.

Printed with ordinary Letterpress from a Block produced by Photography and Electrotype, absolutely untouched by the graver, the Invention of Herr Paul Pretsch.

The British journal of photography.

THE

PHOTOGRAPHIC JOURNAL.

EDITED BY GEORGE SHADBOLT.

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THE PHOTOGRAPHIC JOURNAL.

No. 85, Vol. VI.—JANUARY 1, 1859.

We trust that in making our appearance before our readers in a new guise, they may approve of the change that has taken place, and consider it an improvement as well as an alteration. Like the ladies of the present day, we have greatly enlarged our skirts—and like them, of course, must also regard the arrangement as an embellishment. Lest more engaging costume, however, should have so modified our appearance as to cause some risk of our being mistaken for a stranger, we must remind our readers that we are but "an old friend with a new face," and we hope not only to retain friendships already formed, but to convert acquaintances into friends, and strangers into acquaintances.

It has been a matter of very careful consideration with us how we may become still more useful to our numerous supporters than we have been hitherto—some of our intentions we have already indicated, and we have now further to mention, that we shall commence a series of initiatory articles; *first*, for the benefit of those still on the threshold of photographic fascination; and *second*, for more advanced students, of manipulatory details, descriptive of all the most approved methods of operating, as ascertained up to the present time: for we cannot but feel that photography of to-day is a very different thing from photography as it was a couple of years, or even one year ago—so many labourers are in the field, and so much has been achieved, that it is almost impossible for those not more than commonly interested, to keep pace with all the knowledge that has been acquired in the various ramifications of practical photography.

By this arrangement, it is hoped that all classes of our readers will find their tastes consulted—the novice and the adept, "the mere man of baths, and processes, and chemicals," as we have ourself been contemptuously styled—the man of science and the man of art—in short, we wish to make our pages like the fountain at which all may find something to slake their thirst; and our aim will be to endeavour to follow the wise steward, and "give all their meat in due season."

It has been suggested to us, that the single alteration which we have found it requisite to make in our designation, may possibly tend to cause some confusion with, and inconvenience to, the public, by confounding us with The *Journal of THE PHOTOGRAPHIC SOCIETY*. Now, although we do not think there is any fear on this head, the name of the Photographic Society being so very distinctive, and photographers, as a class, are men of discernment, yet always having hitherto maintained (and we trust *ever* to do so) most amicable relations with the conductors of the oldest publication devoted exclusively to our art-science, we therefore, unsolicited take the present opportunity of disclaiming any intention whatever, of an attempt to assume an attitude of hostility, or to deceive the public in any way. In proof of this assertion, we appeal to the number now before our readers as evidence that neither in size, style of heading, general aspect, or arrangement of matter, is there any resemblance whatever to the publications of the Photographic Society.

With regard to our Title, we have merely altered *the order in which the words were formerly arranged*, and added one or two more.

With a hearty wish that our readers may find the coming year prove a prosperous one, both photographically and otherwise, we pass to the "order of the day."

It appears to be a debateable question, whether of the twain, photographic engraving or photolithography, will be the first that will be practically applied to book illustration. As regards the former, in addition to the productions of Mr. Fox Talbot, now before the public, we have in another column a communication on the subject from our esteemed correspondent, Mr. Burnett. Now, although photometallography, as it has been termed, may, and probably will, eventually become developed into the more important operation of the two, we are strongly of opinion that photolithography, even in its present condition, is sufficiently advanced to render efficient service, with a very small amount of assistance from the hand of the draughtsman. At the last meeting of the Photographic Society, Mr. Malone expressed an opinion in accordance with our own; and since then, we have seen produced by an amateur photographer, acquainted with the lithographic art, as his first essay in this direction, a result that not only astonished us, but that requires only a few touches to convert it into an excellent picture. It must be borne in mind, that there is a vast difference between the assistance of a lithographer and that of an engraver—almost any one capable of handling a pencil can readily qualify himself for one, whilst this is far from being the case with the other.

It may be objected that we are now advocating the very thing we have formerly condemned, viz.—the "touching" of photographs; but we by no means assent to such an imputation; the cases are widely different. We object to "touched" photographs when judging of their respective merits; as obtaining credit upon false pretences. We do not advise or countenance in any way the attempts to impose upon the public proofs from photolithographic stones that have been submitted to the hand of an artist as *pure photographs;* but we do approve of the introduction of photography, as far as it can be rendered available, into the lithographic art. We may have more to say about this in a future number.

We were pleased to notice the other day a very useful application of photography. At the establishment of an auctioneer, and estate agent of the name of Engleheart, in Clement's Lane, London, are a number of paper proofs from negatives of various houses, &c., that are to be let or sold by the exhibitor.

No description, however minute, can possibly give so good an idea of the appearances presented as a single glance at these photographs; and we feel convinced, that a general adoption of the plan would be followed by an immense saving of trouble to the customers, and consequent increase of business to those who render such facilities.

At the meeting of the French Photographic Society, held on the 29th October last, MM. Davanne and Girard presented

the fourth part of their report on "*A General Study of Positive Proofs.*"

We have noticed the three earlier parts of this report in our last volume, and while fully admitting the careful and systematic method in which these gentlemen have conducted their investigations, and the highly interesting nature of the results, we cannot forbear remarking that no new facts appear to have been brought to light; but at the same time it is satisfactory to find, that the conclusions previously arrived at, and published by English experimentalists, have been fully corroborated. The present communication treats of—

1. The influence of the strength of the sensitizing baths on the proofs, and the impoverishment of the bath itself by frequent use.

2. The effect of a longer or shorter time being allowed for the paper to remain in contact with the silver solution.

3. The state of neutrality of the bath, as to its action on the finished proof.

With regard to the influence of the strength of the nitrate bath, the conclusion arrived at is precisely that to which we first directed attention, in a paper read before the Photographic Society nearly two years back, 5th March, 1857, and which was subsequently published in the third volume of the Journal of the Society, under the title, "*Further Observations on Positive Printing,*" and will be found at page 238. The result is materially influenced by the amount of free nitrate of silver. We quote the words of the report—"Thus, then, the strength of the bath exercises a very marked influence; as it increases it improves the print up to a certain limit in defining the outlines with greater sharpness, whilst as it diminishes, it equalises the tones at the same time that it brings with it a decided red hue."

A sheet of paper being salted with a solution of the strength of 25 grains to the ounce of water, and cut into *three pieces*, each piece being sensitized upon baths containing respectively 90 grains, 60 grains, and 40 grains nitrate silver to each ounce of water, the quantity of silver abstracted by each piece was ascertained, and found to be 0·876, 0·633, and 0·467 of metallic silver, or nearly in the proportions of 8, 6, and 4; but as the quantity of the chloride of sodium in each piece of paper was absolutely the same, this in presence of nitrate of silver in excess must have produced the same amount of chloride of silver, and consequently the varying results must have been due to the difference in quantity of *free nitrate of silver*, as admitted by the experimentalists. The conclusion is further corroborated, by exciting a sheet of salted paper upon a strong bath, cutting it into two pieces, and washing away the excess of nitrate from one of them.

The theory of action propounded is as follows—

"When a sheet of paper impregnated with a layer of chloride, mingled with free nitrate of silver, is exposed to the action of light, the chloride on the surface first blackens by reduction, but this chemical reaction sets free a certain quantity of chlorine, which attacks the nitrate in contact with it, forming fresh chloride, which blackens and is reduced in its turn, thus producing successive layers, and it is to this continuous reduction that the intensity of colour is at least in part due."

The following extract so completely agrees with our own remarks, *loc. cit.*, that we cannot forbear quoting it—

"For delicate negatives, producing habitually fogged positives, the bath should be stronger; for those furnishing strongly marked contrasts, it ought on the contrary to be weaker."

With regard to the *impoverishment* of the bath, although this fact was also notorious, the exact degrees of degradation under various circumstances had not hitherto been investigated; suffice it however to state here, that it is clearly traceable to the chloride in the paper which combines with its equivalent of silver, and the paper itself *then* absorbs an amount of the solution of the reduced strength. Albumenized paper lowers the strength, but not nearly in so great a proportion as when plain paper is employed, whilst gelatine and starch are nearly inactive. When salted albumenized paper is employed, the effect of deterioration is greater than with plain albumenized, but less than with plain salted paper. Increased time of contact between the paper and sensitizing bath acts like a stronger bath, because it allows of a larger amount of its absorption by the paper; and lastly, an acid or alkaline bath acts precisely in the same way as the same impurities in the chloride, of which particulars were noted recently in our last volume.

We often determine within our own mind, not to be surprised, happen what will; but alas! for all human resolutions, we constantly find that we have to resolve anew. We have heard so often of astounding discoveries in photography, and have been deluded into reading so many *new* processes which have turned out to be old acquaintances, that we fancied we were quite hardened to that kind of thing; but we certainly were not prepared for the cool manner in which one M. Asser, in a recent number of *Cosmos* puts forth as *new*, an almost verbatim translation of the Ink Printing Process, as practised by Mr. McCraw, lately published at the meeting of the British Association for the Advancement of Science, which process itself *is only a modification* of that of M. Sella. We expect next, that some Englishman will translate M. Asser, and come out with *another* new Printing Process.

In our report of the last meeting of the Manchester Photographic Society, vol. ii, p. 310, the President of the Society called the attention of the meeting to a very important fact that had been discovered by Mr. Young, viz.—that a collodio-albumenized plate having been exposed in the camera, may have the iodide of silver dissolved out with hyposulphite of soda before development, and that the picture may be subsequently developed in ordinary daylight. We find from subsequent inquiry, that the operation does not succeed without the use of albumen; nor does it answer if the iodide be removed by aid of cyanide of potassium. This is a subject well worth pursuing, and we strongly advise those of our readers who are working the collodio-albumen process in any form, to follow it out.

We think the phenomenon admits of a very simple explanation. A compound of some sort, probably of two kinds, is certainly formed between albumen and nitrate of silver, which is sensitive to the action of light, and blackens under its influence. This compound superposed on the iodide of silver, is readily impressed, but unlike the iodide, has itself undergone a chemical change; hence, when the latter is removed by the solvent, the chemical change induced in the compound of albumen and nitrate of silver, is carried on still farther when the necessary ingredients, viz., nitrate of silver and a de-oxidizing agent are supplied.

We are aware, that many consider the question of any chemical change having been effected in the iodide of silver after the import of light, as still undecided; others again hold an opinion, that this change does undoubtedly occur, but in this we are not disposed to acquiesce, and consider that the weight of evidence evidently tends rather to show, that no change of a *chemical* nature occurs in the iodide of silver; but that its office is somewhat analagous to that of platinum, in a finely divided state, when converting the vapour of alcohol into acetic acid; this acting however as an absorbing medium for actinic influence. We merely throw out this suggestion as one that strikes us as explanatory of the effects, and by no means hold ourself to it as a well-considered opinion, but are quite ready to give it up if a better explanation can be found.

The Architectural Photographic Association have opened an Exhibition at the rooms of the Society of Painters in Water Colours, Pall Mall East, which we notice more fully elsewhere.

PHOTOGRAPHIC PAPERS.

One of the greatest difficulties the photographer has to contend with at the present day, is in the papers manufactured expressly for photographic purposes. Of Foreign papers, we have *Papier Saxe*, Canson's, and Marion's; of English, there are Hollingsworth's, Harrison's, and others. Although the pulp of the papers of these different makers is in all respect the same, being composed of linen and cotton rags, yet very different photographic properties are produced from them, in consequence of the sizing being different. English papers are, for the most part, sized with gelatine, while those of the Continent are sized with fecala, or starch and resin soup. Now, the sizing greatly influences the colour of the proof; papers sized with gelatine give very red hues in the printing-frame, while those sized with starch are sepia or violet: still the *quality* of the sizing does not influence the colour of the proofs so much as the *quantity*; for by increasing the quantity of starch in the paper, hues as red as those from gelatine may be obtained.

The sizing not only makes the proofs more vigorous, but also makes them sharper and more delicate. A proof taken on unsized paper, is dull and leaden in hue, and in every respect repulsive. If but slightly sized with albumen, the unsized paper is but little improved: strong starch produces bright orange hues, and if the unsized paper be immersed in a strong solution of gelatine (5 per cent.) fine reddish hues are produced.

The quantity of sizing contained in the paper as delivered by the manufacturer is insufficient for photographic purposes; for proofs taken on plain paper, although very pleasing and satisfactory in an artistic point of view, lack transparency in the shadows, and that general brilliancy of tone which is indispensable to suit the popular taste. However, at the present time, the extra sizing is carried to excess, and except in stereoscopic pictures should be avoided. For portraits, landscapes, architectural subjects, &c., paper prepared with a mixture of albumen and water, in equal parts, has quite sufficient surface and gloss to bring out all the detail, and at the same time to secure adequate transparency in the shadows.

In fact, the higher albumenized paper now sold is to be regarded with suspicion, as the very high glaze is not due to pure albumen, but to an admixture or adulteration, either dextrine or gelatine; the presence of the latter is recognised by the chocolate red colour of the proofs when removed from the pressure frame; and if the wet proofs are allowed to dry while in contact, they adhere together and are spoiled.

Oxide of silver, in combination with gelatine, and exposed to light, becomes an insoluble black varnish, which reflects a golden red hue; but when the combination is first made, the compound is of a mahogany red colour. These facts explain the causes of the variety of hues given by papers sized with different materials. If the paper be unsized, then the salt of silver enters into combination with the fibre of the paper, and the silver tends to decompose and reduce itself; or perhaps, as suggested by Schönbein, ozonized oxygen plays a part in this change. But in the case of sized paper, the particular affinity of the sizing material for the silver overcomes the disposition of the salt of silver to combine with the paper, or to reduce itself, and forming the compound spoken of, the chemical action is not exercised *on* or *by* the paper itself; the picture therefore requires both greater sharpness and the red hue due to the sizing material. Whatever the kind of sizing employed, or the quantity, it does not appear to have any influence upon the rapidity of printing; other things remaining the same.

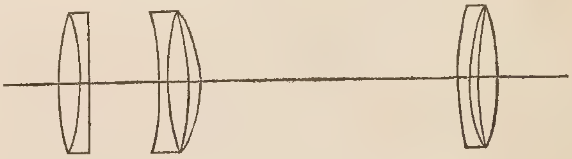
Nor does the thickness of the paper appear to have any influence upon the result, beyond what is due to the greater abundance of sizing it contains; but thick paper is easier to manipulate, although more liable to tear while wet. From what has been stated, it appears that it is a matter of indifference what paper is used, provided it be not used plain, but sized with albumen, dextrine, gelatine, or starch. Some attention must be paid however to the sizing strength of equal weights of these materials, as the results will be materially influenced thereby. Of all the sizing materials, albumen, more or less diluted with water, is to be preferred.

THE PETZVAL AND VOIGTLANDER CONTROVERSY.

Immediately after the introduction of the new landscape lens by Professor Petzval, it was asserted by M. Voigtlander, that the form was *not new*—that he had made for the learned professor a lens upon the same principle no less than seventeen years before. Upon this assertion being denied, he subsequently declared that he still had in his possession the original drawing and formula in Professor Petzval's own handwriting.

A certified literal translation of this document has been deposited with Messrs. George Knight and Co., of Foster-lane, Cheapside, London, which appears to us to completely verify the assertion of M. Voigtlander, and we consider it of sufficient interest to lay it before our readers, which we are enabled to do by the courtesy of Messrs. Knight.

When inspecting the document, we were also shown a meniscus lens, forming the second part of the middle combination in the diagram, which had been accidentally made of crown instead of flint glass, by M. Voigtlander, and which—although it, of course, disturbed the union of the chemical and visual foci—did not affect the perfection of the image, when the necessary allowance of distance to correct this was made. Hence it is contended by M. Voigtlander, that slight variations in the curves to suit the particular density of the different glasses employed do not interfere with the *principle* of the lens, and that the mere reduction of the *diameter* of the second pair of lenses is the only change that has been introduced by Professor Petzval recently into the original formula.



In stating our opinion, that M. Voigtlander is correct in his assertion, it does not detract from any merit due to Professor Petzval for the calculation of the data for the construction of the lens; nor does any body question this point.

The following is a copy of the document mentioned above—

First double lens, consisting of a double-convex lens of crown glass, and a double-concave lens of flint glass.

$r_1 = 36{,}4''' = 3''\ 0{,}4'''$ $r_2 = -28{,}5''' = -2''\ 4{,}5''' = r_3$ $r_4 = 300'''\ 25''$

*$r_1 = 3{,}00''$ $r_2 = -\ 2{,}37$ $r_4 = 25''$

The dispersing lens of compensation, consisting of a double-concave lens of crown glass and a convexo-concave lens of flint glass.

$r_1 = -86{,}4''' = -7''\ 2{,}4'''$ $r_2 = 50{,}8''' = 4''\ 2{,}8'''$ $r_3 = -126{,}3''' = -10''\ 6{,}3'''$ $r_4 = -3{,}69''' = -3''\ 0{,}9'$

*$r_1 = -7{,}11''$ $r_2 = 4.32''$ $r_3 = -9.03''$ $r_4 = -3.11''$

The converging lens of compensation, consisting of a convexo-concave lens of flint glass and a double-convex lens of crown glass.

$r_1 = 72{,}1''' = 6''\ 0{,}1'''$ $r_2 = 25{,}3''' = 2''\ 1{,}3''$ $r_3 = 31{,}3''' = 2''\ 7{,}3''$ $r_4 = -102{,}8''' = -8''\ 6{,}8''$

We certify this to be a copy of a Drawing, and a literal translation of a German document, presented to us by M. Voigtlander.

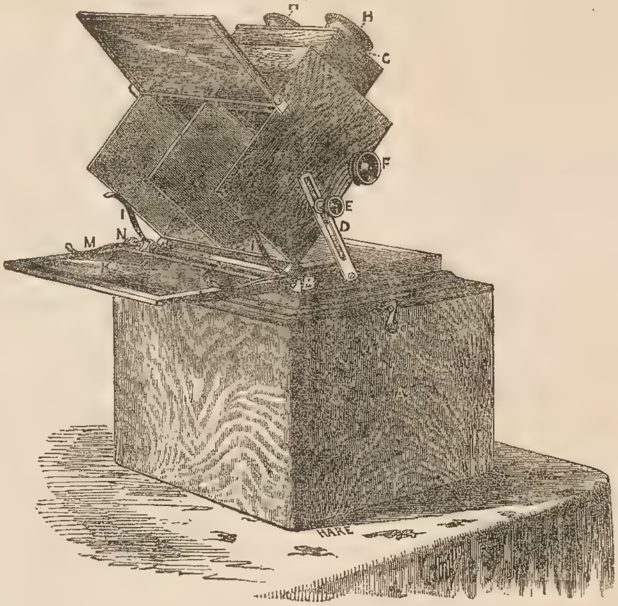
Dr. AUG. ELHDE, *Prof. of Mathematics and Natural Philosophy, at the Collegium Carolinum.*
Dr. HERMAN SCHEFFLER.

These signatures verified, Brunswick, Nov. 12, 1858.—WILLIAM HUGH, *Public Notary.*

* The figures in these two rows are in pencil in the original.

NEW ACHROMATIC STEREOSCOPE.

We have been favoured by Messrs. Smith, Beck & Beck, with the following description of their Stereoscope, which we give in their own words —



In contriving our improved Achromatic Stereoscope, we have had the following objects principally in view —

The application of achromatic lenses, to improve the definition, and to correct the colour produced on the margins of objects by single lenses.

An arrangement to suit any one who has the sight of both eyes.

A stand upon which the instrument can be placed in any position more especially convenient, when the person is seated at a table.

A method of holding the slides, which will allow them to be placed and replaced easily, and without danger.

An illumination to be varied at pleasure.

And lastly, a case to keep the whole from dust, injury, or exposure.

We have been more especially led to the construction of this instrument, by the beauty of those photographs now published, which, from the high position they hold, either as works of art, or as exact transcripts of places of interest, and of the works of nature, will as certainly carry the stereoscope beyond a scientific toy — the point at which it first started, as they will deservedly rescue it from the degraded position it is almost threatened with, by the "got up slides" of gaudy groups and indecent figures.

The Stereoscope as taken out of the case (A) is upside down, but when turned over it will stand on the table, or on the case (as in the figure above) if secured by the hooks (C), it has a joint at (B), and can be fixed in a vertical, horizontal, or any intermediate position, by the brass arm (D), which is tightened up by the small milled head (E).

Two other positions in which the instrument may be required— the one when horizontal and the person is sitting, the other still more raised for a standing position — can be obtained by an additional stand, which is also made available as a cabinet for the slides. The height necessary for these purposes is about ten inches, but in other dimensions, the cabinet may be proportioned to the number of the slides or other requirements.

By these means alone, the Stereoscope can be used at the four followng elevations, viz. —

When standing. When with the case. When alone and on the cabinet. When with the case and on the cabinet. Any intermediate positions can be obtained by the before mentioned joint at (B).

The two milled heads (F) are for the adjustment of the focus. Those who have "long sight" will require the lenses farther from the picture, and as the full extent of the rack-work is frequently insufficient, this distance can be increased, by drawing out the lenses in their fittings at (G); the reverse is of course required for short sight; while many of those whose vision is unaffected in either of these ways, will be able to see well throughout the whole range of adjustment.

Every stereoscopic slide consists of two pictures, but they must unite and form one in the instrument. This will generally be the case when the two arrows on the brass rims (H) point to each other; but there are some kinds of vision, and occasionally errors in the slides, which require one or other of the lenses to be slightly turned round in its fitting at (G) — the method of mounting admits of this, and also of their being easily taken out for the purpose of wiping, *which should be done frequently*.

The slides are placed outside and under the two springs (I).

The illumination requires alittle care. For daylight it is best to face a window. Artificial light should also be in front; but then, it must be remembered, that the distance makes a great difference in the intensity; and also, that a variation in height, as when ordinary candles are burnt, requires a constant alteration in the position of the reflector or the instrument; this will not be the case with gas, or oil lamps, and two of Palmer's candles will answer every purpose.

For transparencies, the door (O) is closed, and the illumination is effected by a movable reflector (K) — packed in the case — but which, when in use, is held by the two brass arms (L) and springs (M), a hinge at (B) affording the necessary variations of position. The silvered or other side, is used according to circumstances; but occasionally, some kind of tinted paper or other reflecting substance is preferable for giving a tone to the picture, whatever it may be; it has only to be placed above the reflector, and under the springs, or in the place of it if of a sufficiently stiff material.

For opaque slides, light is thrown upon the picture by the mirror (O) on the inside of the door, which will remain in any position in which it is placed.

GOLD TONING ON ALBUMENIZED PAPER.

Mr. Hardwich has communicated to the Photographic Society of London some observations on photographic printing, in which he deprecates, as unjust, the prevalent disposition to decry the methods of toning and fixing now in use. In skilful hands, doubtless, the methods in vogue are fully adequate to secure permanency, but the host of pictures "fading away" that meet us on every hand, prove too forcibly that some radical defect exists, if not in the formula at least in the manipulation. It is better to seek to improve the former than the latter; therefore Mr. Hardwich proposes an improved toning by *alkaline* chloride of gold. This mode of toning is adapted for any kind of sensitive paper, but its peculiar value is seen in the case of albumenized paper, which is sometimes difficult to colour by the *sel d'or* process, and even in the ordinary fixing and toning bath of hyposulphite of soda and gold, does not attain to an agreeable tone, unless the bath be kept in a very active condition. Make a solution of chloride of gold, one grain to the ounce of water; take of this

Solution of chloride of gold..........	1 fluid drachm.
Sesquicarbonate of soda........	1 drachm.
Citric acid................................	20 grains.
Water (pure).....	12 fluid ounces.

This solution will not keep when mixed, as it gradually undergoes a change, becoming colourless, and toning more slowly. It is not clearly understood what part the citric acid plays in this mixture; in a warm alkaline solution of chloride of gold it throws down an indigo blue deposit of metallic gold.

A strongly albumenized paper is to be preferred for this method, especially one that prints rather red, otherwise the gold is liable to yield too blue a colour. A rich velvety appearance is promoted by using a sensitizing bath of full strength: sixty grains of silver to the ounce for a paper salted with a ten grain salting solution.

The prints may be kept for a few hours after removal from the printing frame, but it is best to tone them at once. Wash them in two or three changes of water until milkiness disappears; they may be left in the water until it is convenient to tone them, which is done as follows —

Mix the ingredients of the formula given above in an evaporating dish, and when effervescence ceases, place a spirit-lamp beneath, and raise the temperature, with constant stirring, to about

120° F., which is indicated by the steam beginning to rise, and a bluish discolouration, due to commencing reduction, is seen. The lamp must now be removed, else much of the gold will be reduced, changing the colour of the fluid to an inky black, after which it will be nearly useless. Filtering is unnecessary.

This warm liquid is poured into a flat dish, and the prints are put into it, two or three at a time. A little discolouration of the toning solution may be disregarded, since it is caused by a quantity of gold quite microscopic, and will not injure the whites of the proof. Keep the prints constantly moving, and watch the changes of colour. The first two or three may perhaps be toned in about five minutes; but as the liquid cools down, and the quantity of gold decreases, twenty minutes or longer may be allowed. The time, however, is greatly influenced by the quality of the paper; English papers strongly albumenized requiring a longer action.

If the prints are removed from the toning bath as soon as the blue colour of the gold is seen, they will generally change in the fixing bath to a warm hue of brown; but when left for two or three minutes longer, the deeper tone acquired is permanent. The proofs are ready for fixing when they cease to appear red by transmitted light. Over-printed proofs yield the blackest colours, because they may be kept in the gold a longer time without losing the half tones. It is not advisable to attempt to obtain pure white and black tones on proofs printed from feeble negatives, for unless there be a perceptible amount of bronzing, the deep blacks cannot be obtained on albumenized paper.

Each grain of chloride of gold ought to tone six or seven prints, 5 × 7, and two or three of 10 × 12, which is rather more than the number yielded by the same quantity of gold in the *sel d'or* process.

Fixing — The proofs must be rinsed on both sides upon removal from the gold bath, and fixed in the following solution —

Hyposulphite of soda	6 ounces.
Water	1 pint.
Carbonate of soda	½ ounce.

This solution will keep many weeks, and imparts a slightly improved colour after being much used. The carbonate of soda is added to prevent the fixing solution from acquiring sulphurtoning properties to an injurious extent. The time of immersion is from ten to fifteen minutes, or until no mottling appears in the proof when held against the light. The proofs are washed in the usual way.

PHOTOGRAPHIC ENGRAVING ON METAL PLATES.

By C. J. Burnett.

From a paper read before the Edinburgh Botanic Society, March 1858, given as apparently superior to that of Mr. Fox Talbot then published (and it may possibly be in some respects fully equal even to his new one).

I first describe the process in the simpler state, in which it is sufficient for copying pen and ink, or pencil line drawings of plants, scenery, and other objects, wood-cuts, line-engravings, and every thing else consisting of lines alone; and next consider the additional contrivances necessary in etching from true photographs of plants, scenery, natural objects, architecture, paintings, Indian ink drawings, and every thing in fact *not* made up of lines equally translucent. Where a drawing is on thin paper, we may, of course, print from it directly, but generally, of course, the plan is to take first a negative and then a positive to print from.

1. Coat your plate of zinc, iron, steel, copper, or other metal, with the sensitive mixture of bichromate of soda, potash, ammonia, or other bichromate, chromic and uranic, or ferric nitrate, or other salt, with gelatine, gum, meta-gelatine, or allied substance.
2. Dry the plate gradually or by the aid of heat.
3. Print in pressure frame.
4. Connect the plate, metallically, by means of a screw clamp or other arrangement, with a plate — say the same size — of silver, platinum, platinized silver, or other less oxidable metal, and coat the *back* of the first plate with varnish.
5. Plunge the two plates into a weak solution of sulphuric, muriatic, nitric, or other acid, or etching fluid, watching carefully the process, and putting into a weaker or stronger etching bath if required.
6. Wash off the remaining gelatine mixture.

Instead of coupling the plates in the manner now described, we may connect the plate (first varnished on the back) with the wire of *one* (the oxidizing) pole of a galvanic battery or cell, and a plate of silver, copper, or other less oxidable metal, with the wire of the *other* pole, and plunge the two plates, opposite each other, into the etching bath, containing a solution of, say, sulphuric, muriatic, nitric, acetic, tartaric, chloric (oxalic ?) or other acid; or of sulphate of soda, muriate of soda, nitrate of potash, chlorate of potash or of soda, acetate, oxalate, or tartrate of soda or other, salt—the strength of action being regulated either by the strength of the battery (which may have its metallic elements raised or depressed in their cell or trough), or by the strength of the etching bath. If the plates are connected as first described, it is, of course, by the latter that we regulate it.

N.B.—The object of the galvanic current connexion which I have introduced, is to prevent the production of a deposition of gas-bubbles on the metal plate being etched. It will be evident, that these bubbles being evolved *under* the gelatine, would be apt to cause a separation or blowing up of it at the surface of the metal. It might be fancied that the washing away of the soluble gelatine before etching, generally recommended in such processes, would remove this difficulty; but besides other objections to such washing, it does not appear that it can answer any such purpose, except in the case of a picture composed entirely of lines, and those lines all of the same depth of blackness. Any attempt to remove the gelatine or other mixture, before etching, is, therefore, it appears not only useless but likely to interfere seriously with the delicacy and uniformity of the etching. It will be seen at once by any one having the slightest acquaintance with galvanic action, that the gas is on this plan evoked on the less oxidable metal, or at the opposite pole instead of on the metal being etched.

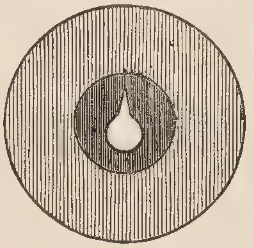
As the plan of applying resin-powder *above* the gelatine or other coating before etching would not be likely to answer,* we may apply it below, as suggested by Mr. Fox Talbot, or *far rather* follow out a plan or plans suggested to me by the shade of fine gauze, mentioned by Mr. Talbot as adopted by him in one of his old processes. I would recommend a set of fine *crossed* or uncrossed lines or dots, photographically or otherwise produced (we may get very fine lines or dots by photographing, on a *smaller*, from those accurately *drawn* on a *much larger* scale); they may be either on a separate glass, or on the print itself *from* which we are printing on to the metal, or a little charcoal powder, lycopodium, or other fine powder may be sprinkled on the back or front of the print, or on a separate glass to be placed above it. The same set of lines, if on a *separate* glass, may answer for printing from any number of different negatives, and we may make glasses or paper for the same purpose, by photography, from a charcoal or other powder-sprinkled surface.

This same mode of procuring grain will answer equally as well for photolithography, or photoxylographic blocks, with gelatine and bichromate, or any of the allied mixtures already alluded to.

ON THE FORM OF THE APERTURE IN THE DIAPHRAGM OF A LENS FOR LANDSCAPES.

By Wm. Ross.

I have noticed sundry intimations in the *Journal* of some methods of contracting the aperture of a lens, one or more of them being obviously more costly than the majority of persons using the camera can afford to supply themselves with. I am a great advocate for every one being able to supply the occasional deficiences of his apparatus by his own ingenuity, and therefore send you the description of the diaphragm and aperture I have now used for several years. The diaphragm is itself cut out of thin cardboard, of such a diameter as will easily slip into the tube in which it is to be used. In the centre of it I describe a circle, of a size adapted to the focal length of the lens, as modified by the objects in the view to be taken. If all are beyond the longest conjugate focus of the lens, then the quantity of light to be admitted is the only consideration which ought to enter into the determination of the size or shape of the aperture; and as the circle contains the largest area of all the figures, this would appear to be the best form where all the extreme rays are equi-distant from the axis of the lens.



When some of the objects are nearer the lens than in the above

* Mr. Fox Talbot's new process has shown that I was quite mistaken in supposing that there was any impossibility in this, but I leave it as written, and still it would appear to me that some of the plans here specified (founded, as I have mentioned, on another of Mr. Fox Talbot, to whom we owe so much) are likely to prove more convenient and give equal if not more, satisfactory results than any aquatint application to the plate.

case, a much smaller aperture is required, which of itself involves a longer time of exposure to the light to produce the impression. Now every one of any experience knows that the upper parts of all objects are much sooner impressed than the lower portions, and as this is the case, a modification of the aperture should be made to meet this inequality, either by excluding some of the rays from the upper side, or by permitting more of those from the lower portions of the object to get access to the tablet.

This I accomplish by not cutting out the whole of the circle in the middle of the diaphragm, but I cut the aperture of the shape of a Florence oil flask. The position in which this diaphragm is to be placed in the tube will depend on whether it may be most convenient to place it between the lens and the view to be taken, or between it and the tablet on which the impression is to be made. In the former case, the small end of the aperture must be placed upwards; whereas in the latter case, *i.e.* with the diaphragm *inside* the lens, the wide end of the aperture should be uppermost. By this means also, clouds may be taken without being overdone while the landscape is being impressed, as is so often the case. I use the former method with an ordinary camera on the ground; but in my *waggon camera* I use the other, because when I wish to change it I cannot conveniently reach the outside of the lens, which is about 8½ feet from the ground. In my sciopteric camera (see *Liverpool and Manchester Photographic Journal*, vol. 1, new series, p. 49). I also use the diaphragm inside the lens, and it is of the same shape as the above figure, only longer and of much less width in proportion to its height. By the way, I see some persons are now engaged in England in reinventing the sciopteric camera, and after that happens, Mr. Seeley of New York will "*invent and introduce*" it without delay, as he does most other things which promise to be of use in the art.

Meetings of Societies.

Blackheath Photographic Society.

An ordinary meeting of this Society was held on Monday, the 20th ult., J. Glaisher, Esq., President, in the chair. The minutes of the last meeting were read and confirmed.

S. Knill and H. Williams, Esqrs., were duly elected members of the Society.

Mr. Heisch called the attention of the Society to the subject of mounting photographs. He stated, that though he still thought India rubber in many respects the best substance for the purpose, because it not only had no action on the photograph, but protected it from the effects of the bleaching substances sometimes left in the mounting board, yet that it had some disadvantages—it was troublesome to use, and if the drawings were brought too near a fire, it sometimes gave way. He was then driven to the use of glue, or some other kind of gelatine, which answers very well, but requiring to be used hot, it is difficult to get it evenly spread on a large drawing before it chills, unless it be made so thin as to soak into the paper, and thereby warp the mounting board as it dries. Having lately been using meta-gelatine as a preservative for dry plates, he was struck with its excellent adhesive properties, and tried it for mounting; it answered well, stuck as firm as glue, and could be applied to the largest surface with the utmost deliberation. The solution he employed was made by placing one ounce of pianoforte-makers' glue in ten ounces of water, with from forty to fifty minims of concentrated sulphuric acid; when the glue is quite swelled, which takes three or four hours, it is heated and kept near the boiling point for two or three hours longer, the acid saturated with carbonate of lime (common whiting does very well), and the solution filtered hot; two ounces of spirits of wine is now added, and the whole made up to twenty ounces. If not quite clear, the solution will now filter easily at a temperature of about 80°, while at from 60° to 65° it is sufficiently thick, not to swell the paper to which it is applied enough to make it warp the mounting board. The solution will keep for months.*

Mr. Melhuish exhibited some transparent stereographs from negatives, recently sent him by F. Haes, Esq. The negatives were taken in intensely hot weather, in Cairo, on plates prepared by Dr. Hill Norris, before Mr. Haes left England. Mr. Haes stated, that the time of exposure was much longer than would have been required in this country.

Mr. Knill exhibited some large photographs which he had recently brought from Rome, and Mr. James a very beautiful photograph from a drawing.

The meeting then adjourned.

* Since the meeting of the Society, Mr. Heisch has found that the heating with the acid must not be too prolonged, that in fact a small quantity of gelatine must be left unconnected, otherwise the solution runs quite limpid at all temperatures.

Chorlton Photographic Association.

The monthly meeting of the above Society was held on the 9th ult., at the Chorlton Town Hall, when the President of the Society, Professor Roscoe, B.A., Ph.D., addressed the meeting "*On the Measurement of the Chemical Action of Light.*"

The learned Professor exhibited an instrument contrived for the purpose, the test being the action of light on a mixture of hydrogen and chlorine gases, the amount of chemical action being ascertained by the quantity of hydro-chloric acid produced, the susceptibility being so great, that an atom of oxygen being amongst the prepared gases caused the working to cease.

The preparation of the gases was explained, and the mode of registration elucidated.

The instrument required a considerable time to reach its maximum of action, but after three days, the actinism could be read off as from a thermometer. The spectrum was produced with a prism, by the aid of the oxy-hydrogen light, and the Professor's remarks thereon received the warm approbation of the meeting.

Professor Roscoe also presented to the Society two pamphlets, "*On Photo-Chemical Researches.*"*

Some prints in carbon were exhibited by Mr. Hooper, which were said to be the best of the kind yet seen, but the peculiar colour was objected to. Mr. Hooper remarked, that the carbon could be coloured, by adding some pigment to produce another shade of black. Some prints were also exhibited, toned with carbonate of soda and chloride of gold, which were much admired from the absence of the unpleasant colour, often produced by hypo-sulphate of soda and gold toning. The whites of these were pure and the blacks brilliant.

Mr. Fawcett proposed, that the best thanks of the meeting be given to the President, for his able address, and for his sympathy with the Society; and also for the donation of the works, which he hoped would be carefully perused by the members.

The President in thanking the members for their attention to the address he had the honour of delivering, said it would afford him pleasure to be of use to any member who experienced difficulty in a chemical point of view, and would be glad to answer questions put to him at any time.

Macclesfield Photographic Society.

The members of this Society, the establishment of which was noticed in our April numbers, have continued to meet during the season; and on several occasions very interesting papers have been read, some of which have appeared in our columns.

A numerously attended special meeting was held on the 14th inst., for the transaction of business connected with the practical working of the Society, at which, after hearing the statements of the Secretary and the Treasurer with regard to its present position and prospects, some minor changes in its arrangements were agreed to, and a committee was named to carry out an object towards which some steps appear already to have been taken, viz.—the organization of an Exhibition of Photographs, &c., under the auspices of the Society, in connection with the Annual Exhibition about to take place at the Government School of Design. Pictures for exhibition will require to be forwarded to F. M. Mercer, Esq., the Secretary, and the Exhibition itself will be probably opened during the first week in January.

Exhibitions.

ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

The managers of this Association, which was formed for the distribution among its subscribers of photographs *illustrative of architecture*, have opened an Exhibition at the Gallery in Pall Mall East, in order to give the members an opportunity of selecting such works as they may prefer, and doubtless, also, to enlist new subscribers.

Besides the ordinary catalogue, an *illustrated* one is also published, containing six photographic plates, on which are represented very reduced copies of the whole of the subjects (with their catalogue numbers), comprising the collection, thus enabling those members, who from absence from the metropolis or other cause are unable

* The subject of these pamphlets was noticed in our last volume.—Ed.

to attend, to make their choice. Each proof has attached to it a relative numerical value, members being entitled to receive for their subscriptions a number of proofs, not exceeding a certain aggregate amount of these arbitrary numbers.

The ostensible object of the Association is clearly not understood by our excellent contemporary, the *Athenæum*, as will be readily gathered from the following extract of a notice of the exhibition, which appeared in its pages last week—

"Why the figure photographers should recede from the architectural photographers we cannot see; but we suppose these secessions are *protests against error*, and that somebody has done wrong and compelled the planting of this fresh art-colony at a time of the year when any thing new in art is always welcome, as long as it is not connected with 'the old Christmas trick,' which shopkeepers seem to use, as by common consent, to work off their faded stock."

By the way, the above is rather an unfortunate illustration, as regards "the old Christmas trick;" for about nine-tenths of the pictures exhibited, however meritorious they may be, are very old acquaintances of ours, and doubtless also of most other photographers.

We cannot very clearly perceive in what way photography is advanced by this Association, neither is the advantage to the members themselves very apparent, as most of the subjects can be procured direct from the artists themselves, or their publishing agents, at a cost certainly not exceeding that now charged for them without each person being compelled to take (or to pay for) any thing he does not want.

The disadvantage to photography is more potent, firstly, in the presumption set afloat that its votaries are a very disunited set; secondly, in the fact that a collection of merely architectural subjects must and does present a very monotonous effect; and thus an erroneous impression is likely to gain ground with the public that a photographic exhibition is a very "slow affair," for it can hardly be expected that mere sight-seers will take the trouble of ascertaining the cause of its sombre aspect.

A criticism of such a collection as that now under consideration, is of necessity more than usually liable to be influenced by the personality of the critic, and his figurative "point of view," of which in the present case there are at the least four, viz.,—the architectural, the antiquarian, the artistic, and the manipulative. As we write however for photographers, and for them only, it is as a photographer we shall deal with the contributions.

One of the remarkable features is the absence of frames, properly so called, the subjects being arranged against the walls, and the edges covered by horizontal and perpendicular slips of gilt beading, —an arrangement that not only economises space, but we should think money also, and, in our opinion, well worthy of the consideration of managers of these exhibitions. It is a modification of a measure adapted by the Leeds photographers, at the late meeting of the British Association for the Advancement of Science, and was described at the time in our pages.

Another unusual arrangement consists in the collection in separate masses of the productions of each contributor, and in this the advantages and disadvantages seem to be pretty equally balanced, for though it tends to the unity of design, it also adds materially to the monotony; in the present case, perhaps more than in an ordinary collection, where all classes of subjects, instead of one only, are admitted. The happy medium was hit upon at the exhibition of the Photographic Society (London), in January 1858, at the South Kensington Museum, where masses of works, the production of one artist, were relieved by the occasional commingling with those of many other operators; thus unity of design and variety of contrast being both duly represented.

Of the 120 views in Rome, contributed by Macpherson, we have no remarks to make interesting to photographers: they are all well known, and as photographs have no particular merit. The antiquary and architect will probably be delighted with them; our own choice would fall upon No. 110, "Window in the house of Lucrezia Borgia," as presenting something more of the picturesque than the generality of them.

Cimetta has thirty-four illustrations of Venice, of large size, 21 by 17 inches, but scarcely one of which we should care to possess, for not only are they of a very unpleasant brown tone, but most if not all of them are distorted in consequence of what is generally known by "cocking the camera." Had they been taken on a smaller scale, this defect might very probably have been avoided.

Robertson and Beato exhibit about thirty views of and around Cairo, of about one-third of the size of the last mentioned, and among them are several very interesting illustrations of street architecture, valuable in every collection. We notice particularly Nos. 190, 197, 204, 212, 214, and although in some of these a slight haziness is apparent near the basements of the houses, owing evidently to the constant movement of figures in the way, it is not sufficient materially to interfere with the general effect.

Lonsada has a score of Spanish subjects, but the whole of them are so deficient in sharpness and general manipulation, that they are only fit for *stop-gaps* for an architect, until he can procure better representations of the objects delineated—photographically, they are absolutely valueless.

Cade of Ipswich, and *Cocke* of Salisbury, contribute between 50 and 60 subjects from Oxford, Cambridge, Ipswich, Salisbury, &c.

We are somewhat surprised at the absence of *Delamotte's* Oxford illustrations, and *Fenton's* Cathedrals; surely, they ought to have found an honourable position in an architectural collection.

Baldus has a dozen of his views in Paris, Caen, &c., but these are too familiar to photographers to need further comment.

Of Frank Frith's beautiful Egyptian and Scotch scenes we need say but little, having more particularly noticed them on previous occasions. There is one curiosity, however, that must not be overlooked, a Panorama of Cairo, measuring 8 feet 6 inches by 20 inches high. This is of course produced by joining several proofs from as many negatives, but the junctions are in all the cases well managed, and the printing of each piece toned to the same hue.

There is one point in which the managers of the Association have been "wise in their generation." We mean in retaining the services of Mr. Bedford, to produce expressly for the Association a set of negatives of Tintern Abbey, Raglan Castle, &c., in number about thirty. It is amongst these, Frith's, and some few others only, that any members, not architects, will be sure to make their choice. Certainly, as pictures, those named are the most desirable in the room.

Of Mr. Bedford's we admire especially No. 313, West Front of Tintern Abbey, and 321, West Door of the same; 323, Chepstow Castle; 315, the Donjon, Raglan Castle; and 317, the Entrance Gate of the same. Nos. 336, 337, 338, 340, 341, Subjects at Canterbury, are also very beautiful, and executed with the usual skill of this artist.

We shall be somewhat curious to learn how far this exhibition will prove popular, after the opening of that of the Photographic Society in Suffolk Street, which is now shortly to take place; for, if report speaks truly, the occupation of these rooms in Pall Mall by the Association was accomplished by aid of what we suppose we must call "successful diplomacy," at the expense of the Photographic Society. However, be that as it may, we rather think that a preference will be shown where the attractions are likely to be more varied than in the present case.

NOTES ON THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND

[From a Correspondent.]

Edinburgh, December, 1858.

Happening to be in Scotland in December, as I was piloting my way from the station to some respectable hotel, two or three ragged urchins badgered me to buy from them the morning paper, which I did, more to get rid of their pertinacity than any thing else. On opening the paper after getting to my hotel, the first thing that caught my eye was the advertisement of the Exhibition of the Photographic Society of Scotland. This was more than I had bargained for in my journey to the north, but too good an opportunity to let slip; so I discharged my more urgent business, determining to make the most of my short stay in Edinburgh. I have resolved to send you a few notes to keep you *au courant* with the times on the art I love so much, but have time to practice so little.

The Society's Exhibition Room is situated in George Street, about the centre of the New Town, in a very eligible locality, consisting of one large ornamented saloon, with two screens across the room, erected for the purpose. I find a goodly number of pictures from English artists (somewhere about 300, or nearly a third part of the whole), have found their way north from F. Bedford, Barnes, Caldesi, Claudet, Delamotte, Davies, Frith, Herring, Lyte, Maull and Polyblank, Melhuish, Morgan, Mudd, Pouncey, Robinson, and last though not least, our old friend, Rejlander, whose mag-

nificent landscape of Loch Katrine surpasses anything I have seen as a photograph from nature, in or out of Scotland; it is No. 639.

"Where wild rose, eglantine, and broom,
Wasted around their rich perfume,
The birch-trees wept in fragrant balm,
And aspens slept beneath the calm,
The silver light ——————"

It is by far the largest and finest composition in the saloon. How soft and placid is the water in the fore-ground; the bold, gray lichened crags in the middle distance, whose base is richly clothed with dwarfed birch and oaken copse, to the water's edge; the sweetly subdued and distant hills, miles away, with the light playing through the clouds, softening and illuminating the entire piece! This glorious picture is the centre piece of one of the screens, and is worth coming to Scotland to see, to those who have time and means at command. I even forgive the badgering newspaper boys who annoyed me, and will be on good terms with the whole race till next Christmas at least. I find a few more pictures of this ingenious and ambitious artist, which I have not seen before.—No. 427 is an interior group, entitled "The Scripture Reader." In a humble cottage sits a young person, a female missionary, reading the Bible to a quaint-looking old woman, who, busy spinning, has stopped her wheel; the old man is seated on the stair-case in wrapt attention, listening to the reader; in the foreground is a dog (a remarkably good sitter for his portrait) and basket, with the neck of a bottle obtruding, doubtless containing a cordial to refresh some way-worn, weary spirit. The young woman's over-dress and bonnet are carelessly laid on a chair, and the open Bible spread in her lap. The shelf with domestic utensils, and the German clock, with other accessories, render this a most inviting study. The grouping is excellent, and implies a master's hand.—No. 510, is a portion of "Two Ways of Life," which as a whole was turned to the door a year ago, by the fastidious Scotch committee, and which, I am informed, disrupted the Society, dividing the professional and amateurs into two distinct parties. This photographic picture, as a whole, is unsurpassed in Europe; but, clipped into little bits, tells no tale: this is the industrial or right hand group. Whether this has been received and shown this year in order to mollify the keen and bitter feelings evoked by its rejection, I cannot tell; but the committee seem either to be changed, or something "has come o'er the spirit of their dream," for I find, in perhaps the most prominent place in all the Exhibition (No. 283), an entirely *nude* Venus de Medici, by Alinari, (does being an Italian make the difference ?) nude from top to toe, and I cannot understand upon what ground or principles men act, who hang and prominently exhibit the one while they reject the other, unless it be by way of condonement for the egregious blunder stumbled into on that occasion, which gentlemen connected with the art and locality inform us was far from being homologated by a large portion of the Society, even of the remanent members.

"—————— But to confess their error,
That were nobler still."—

Perhaps Mr. Rejlander's sympathies will be touched when he is informed they were a committee of BACHELORS. He has not, however, given them the option of choosing and rejecting this year, as I observe by the catalogue all his pictures exhibited seem to be the property of others.—No. 505, exhibited by Mr. Laurie, is another of Rejlander's composite pieces, "Judith and Holofernes." I think the heroine in this piece is rather too good-natured looking to have been a murderess; and yet she has a bold, defiant bearing, as she stands with the weapon in the one hand and the head of Holofernes in the other. The drapery of the figure is well executed.—No. 67 is a portion of an intended larger work, entitled the "Seven Ages" of Shakspeare."

These are pictures in which there is a breadth and harmony that might be envied by a "Harvey," even though in that gentleman's estimation, "Photographers are not artists," but all artists (that is R.S.A's.) are photographers (?) You should commend to your friend Rejlander, as a text book for his next great picture, the "Pilgrim's Progress;" and in doing so have little fear of his habiting honest John Bunyan in the costume of Italian Piferari, as was done by an artistic Royal Academician some years ago, and exhibited at the Royal Scottish Academy.—Mr. Robinson, of Leamington, has also been trying his hand at composition from various negatives, somewhat less ambitiously than Rejlander. No. 219 to 223 are five pictures, entitled "Fear," "Vanity," "The Model," "Devotion," and the "Minature," with the same figure in all, evidently being *his* model, for she also appears in "Fading Away," and some others, by this artist. In these five he has endeavoured to catch the delicate and subtle expression of the passions, not easily attained, even with skilful posé, drapery, &c.

I think him more successful in the "Red Riding Hood" series, an ancient nursery epic, where four of the chief incidents of that charming story are well depicted. In the first there is the mother, a bustling, active-looking woman, preparing the present, the little "pot of butter," &c., to be carried by the child to gran'ma, and is strongly contrasted with the simplicity of the little messenger. In the next she has arrived at the cottage door (too little of the cottage is seen): having knocked, she is invited to enter in a strange, hoarse voice. In the third the artist places her standing at the head of grandmamma's bed, amazed and frightened at the change undergone since her last visit; the wolf being habited in the old woman's nightcap, trimly put on, with a partially-opened mouth, showing the long, large, white, pearly teeth; entirely covered with bedclothes save the head, enough to stupify and confuse the philosophy of an older and wiser head than that of the simple child. In the fourth the frightened little woman has returned to her mother, and having related the story of her adventures, is seen thanking her Maker at her mother's knee, for having been preserved from being eaten up by the horrid wolf. There is a large amount of skilful grouping and arrangement in the details of this series, which render each one a fascinating study.

No. 644, "Fading away," is a subject I do not like, and I wonder Mr. Robinson should have allowed his fancy to fix on it; it is a picture no one could hang up in a room, and revert to with pleasure. I am certain this artist is competent to do something better; his conception and rendering of character is good, and, with more practice and a proper choice of subject, will yet shine lustrously in the photgraphic firmament.—Fenton's "Reverie," (No. 149), is also something akin to this class of pictures. No Scottish artist exhibits in, or seems to have turned his attention to, this branch of the art. Perhaps the most curious and interesting pictures to photographers, are some seascapes by Mr. Kibble, a Glasgow amateur, who exhibits 22, if I mistake not, mostly, if not the whole, by the collodio-albumen process. Of these, No. 164, "Express Steamer," is a magnificent production, though the picture is small; it is taken in the *fortieth* part of a second, and developed in *ninety hours*: the rolling clouds are a beautiful transcript of nature. The steamer (of which you have a profile) is running very quickly, leaving a deep furrow in the waste of water, heaving with agitation, as she is forced onward by the propulsive steam. This is verily a triumph of instantaneous photography, of which I had no conception dry collodion was capable. I trust, as this gentleman is an amateur artist, that he will publish his developer, which will be certain to give an impetus to the dry process. His other pictures, of which there are both landscapes and portraits, are remarkably fine.—Mr. Wilson, of Aberdeen, has also several sea and cloud pieces by collodion, equal, in my estimation, to any I have seen of Le Gray's. The "waxed paper" seems also to be improving, and gives good results, where collodion would be too quick and set before it had been sufficiently exposed, in corridors, such as Roslin Chapel, of which there are several views by Mr. Herries and W. D. C. Those of Mr. Herries are very good, but I rather suspect, on close examination, that the bars or beads holding the squares of glass have been deepened and strengthened, if not in some parts entirely ruled in. The windows of W. D. C. (No. 203,) is evidently doctored, and that with a rough hand.—There are also some good pictures of buildings and landscapes by Mr. Zeigler. (No. 112) "The Grange House," and (No. 171) "Cottages at the Grange," are good specimens; the latter is a first-rate production, well chosen, sharp and clear in the shadows, with reflected light twittering from the sheen, glossy leaves of the climbing ivy.

Mr. Raven is also an adept in manipulating this waxed paper process, and exhibits a large number (thirty two) from the district of Pau, in France, and the Pyrenees—fine large views, 10 by 12 or thereabouts.—No. 216, "Pierrefitte," is a noble specimen, with a conical mountain in the distance, and the town spread in the foreground at its base, sharp and clear.—242, "Pau," is also very creditable to this artist: in short he has been very successful; but it would be impossible to go over them in detail, the more especially as I intend to allude to some others in the same locality, by Maxwell Lyte, which are superb. However, you have now as much as you will be able to find space for in your next number.

SEL D'OR.

[Many of the pictures in this exhibition, noticed by our correspondent, have been described by us in our last volume, and we are glad to find our favourable opinion of them corroborated by others. We allude more particularly to those of Rejlander, Robinson, and Wilson.—ED.]

New Processes.

PAPER POSITIVES BY MODIFICATIONS OF M. SELLA'S INK PROCESSES.

In our report of the meeting of the North London Photographic Association, which took place in November last, a discussion upon new methods of printing by means of iron salts was recorded, and some very promising specimens by Mr. Hannaford were noticed. We have recently been favoured by that gentleman with some still better specimens, and the following outline of his mode of proceeding, which although not yet perfect, evidently shows capabilities that are, we consider, certain to be developed by a little further investigation. At present the lights are not quite free from a *tinge* of blue (it is but a tinge), and the half tones, though somewhat "*shy*," do exist. We have a promise of more elaborate details for our next, in the meantime we give a sketch of an

IRON PRINTING PROCESS.

By Michael Hannaford.

The paper is sensitised by being floated on a solution of bichromate of potassa, ammonio-citrate of iron, gum arabic and sugar, and is then exposed under a negative in the usual manner.

Taken from the printing frame, the picture is immersed in water to soak out the bichromate of potassa, iron, &c., not acted on by light. The print can now be toned to resemble almost any tint of the ordinary silver process, by using, firstly, the salts of the various metals, gold, silver, copper, manganese, uranium, &c.; and secondly, gallic acid or tannin. Ferro cyanide of potassium and gallic acid gives Prussian blue; ferrid cyanide of potassium and gallic acid blue-black; and gallic acid alone a good sepia tint.

The above so closely resembles in principle a process with which we were favoured by Mr. Burnett, some months ago, that we cannot forbear publishing it now, although we were anxious to make further experiments upon it first.

INK PROCESS.

By C. J. Burnett.

1. Paper Preparation — With a solution containing say *eight* to twelve parts by weight of *ammonio-ferric-oxalate*, and either *four* parts of *bichromate of ammonia* or *one* part of *chromic acid*.

N. B.—The paper may either be plain or albumenized, and a little gelatine may be, in either case, dipped in the sensitizing solution. Prepare dry, and keep *very carefully in the dark, and even the solution must not get the slightest gleam of light.*

2. Expose in pressure-frame not too long.

3. Wash very carefully in a good many waters containing (*most* or *all* of them but the first), a very minute quantity of citric, acetic, oxalic, or other acid, bi-tartrate of potash or other acid salt. The last water may be distilled water or *neutralized* rain-water. I have also tried several of the ammonia salts in washing.

4. Development by a solution of gallic or tannic acid (a mixture of the latter with ammonia, or ammoniacal, or other alkaline carbonate) or by prussiate of potash, by the one, and then further by the other (say by the prussiate first and then by gallic acid).

N.B.—A little of the acetate or ammonio-oxalate or other vegetable salt of copper may be substituted for *part* of the ammonio-ferric oxalate (particularly with a view to the *prussiate of potash developement*), or bichromate of *copper* may be substituted for the *bichromate* of *ammonia* (or a little oxide or chromate of copper dissolved in the solution of chromic acid, &c.)

The albumen protects the chronic acid from a *too easy* reduction by the paper, and the gelatine mixture helps still farther to keep it on the surface. Try also $N O^5 \times Fe\ ^2O^3$ or $Cl^2\ Fe$ instead of ammonio-oxalate.

By *substituting* a *copper salt entirely* for the ammonio ferric-oxalate we get a copper print (developing in this case by prussiate of potash) and toning by iron if we do not wish a red-brown print, as for withered foliage or ferns. *Sulphate of copper and bichromate of potash or of ammonia were the basis of the cuprotype* or copper process published during the last year (see *Photographic Journal* of August), by which I got some *very fine* and highly promising prints, particularly that which I sent up to Mr. Crookes [see my letter in the *Journal of the Photographic Society*, 1857] requesting to *give one of them (a view of an old gateway,) in my name,* to the Photographic Society, it being the best I had produced, and a very fair print of good dark purple black, perfectly pure in the lights. Though I never received any acknowledgment of its receipt by the Society, I can hardly doubt Mr. Crookes's having given it, so that you can probably see it in their rooms.

My impression is, that that process promised fully as well as any ink-process yet published.

I have not ascertained the correct proportion in the substances for paper preparation here, and you may frequently enough find others quite superior, still the quantity of chromic acid must be kept down *very low in proportion* to the ammonio-ferric-oxalate — and you *must not over-expose* the prints.

The oxalic acid is decomposed by the chromic acid.

Ammonio-citrates, or ammonio-tartrates, or *acetate* of *ferric* oxide might probably be substituted for the ammonio-*oxalate.*

Letters to a Young Photographer.

No. I.

My Dear Eusebius —

I hasten to comply with your request, that I should give you the benefit of my experience in the delightful art of photography; and although I may be able to save you much annoyance and disappointment, do not suppose but that you must unavoidably buy a good deal of experience for yourself, and perhaps at a very high rate too. For knowledge in photography is gained only by experiment, and experiment implies failure; but failures give experience, and the more experience the nearer we arrive at perfection in art. Many there are, who think photorgaphy can be taught like cookery, and that a recipe can be given for making pictures as well as pies; but give a recipe for making a pie to one having no preconceived notion of pie-making, and doubtless, the recipe would fail in such hands. So in photography. How many there are who in their simplicity think it only necessary to obtain a camera and chemicals, then buy a shilling manual, and they are set up, full-fledged photographers. But how soon all their aërial castles vanish into thin air, or tumble to the ground. Those, my dear Eusebius, who begin with taking pictures, commence at the wrong end — begin, in fact, where they should leave off. As the aim and end of the photographer is to obtain good positive pictures, it is evidently of the first importance that he should ascertain what constitutes a good picture. This knowledge can only be arrived at by great familiarity with negatives, good and bad, such as the printing of positives affords. Having ascertained what are the qualities in a negative that yield the best results, you will then have before your mind a clear and well-defined object, which will render your operations with the camera more satisfactory, because, instead of being contented with any thing of a picture, so it be one, you will at once reject as abortions all those which fall short of the standard you have set up. Begin, therefore, your photographic career, with positive printing.

Your outfit need not cost much. You had better prepare your paper for yourself. You will acquire delicacy of handling and touch — a very important accomplishment in photography. You must provide yourself with a large dish to float your paper in, and this may be either of porcelain or of wood, lined with glass. Another dish of smaller size, but as large as the largest size paper you propose to make use of, must be reserved exclusively for the silver solution. At first you will find it very inconvenient to manipulate whole sheets of paper, so you had better cut the sheets to one quarter, or one-third, or one-sixth, and then the floating will be more manageable. The room where you propose to albumenize your paper, should be kept very clean and free from dust or soot. You will require some arrangement of laths, &c., to pin the paper to while it is drying. The table at which you operate should be opposite to a good light, and some contrivance must be made to catch the albumen that drips from the sheets when suspended. Take any number of eggs, and breaking them carefully, pour the whites, free from any admixture of the yolk, into a clean bason; add about equal quantity of water, and put the whole into a large bottle, so as to about one-half or two-thirds fill it. For every pint of the mixture of albumen and water add six drachms of hydrochlorate of ammonia and one drachm of solution of ammonia. Agitate the whole for an hour or more, until the fluid becomes a mass of froth, and let it subside for twelve hours, then strain it through a sponge in a glass or earthenware funnel. Pour a sufficient quantity of this into a dish placed level, and remove all air-bubbles from the surface, then float the paper upon it in the following manner —

Take the sheet by the corners diagonally, and bring them towards each other, so as to make the paper curve; let the middle of the sheet first touch the surface of the fluid, and then gradually let the paper fall gently upon it: see that no bubbles adhere to the surface of the paper. Let it float three or four minutes, then lift it out, without allowing the back to become wetted, and drain it into a dish or pan, so as to recover the albumen, then pin it up by one corner to dry. The room in which this operation is performed should be made as warm as possible.

Photographic Glossary.

Aberration — The aberrations with which we are most concerned in photography, are *spherical* and *chromatic* aberrations. The word is used to signify a wandering from the true path or place. *Spherical aberration* is that distortion of true lines in an image, consequent upon the reflection or refraction of the rays by a spherical surface. It is not possible to construct a single lens with spherical surfaces that will give an image entirely free from aberration; but it may be so much corrected, by forming a lens of two or more glasses of different forms and qualities of glass, as to be practically nullified, as is seen in the various modifications of the "orthoscopic" lens.

Aberration, Chromatic — White light is composed of rays of six or more different colours, each of which has a different degree of refrangibility, so that when a ray passes through a simple lens, each of these coloured rays has a different focus along the axis of the lens, which constitutes chromatic aberration. As these rays have very different chemical powers, it is important to the photographer that this aberration should be corrected, which is done, he rendering the lens ACHROMATIC.

Accelerators — Various substances which are added to iodide and chloride of silver, with the view of quickening the action of light, and thereby accelerating the production of an image. Their use has for the most part been confined to the Daguerreotype process, in which *bromine* performs a very important accelerating influence, reducing the exposure in the camera from minutes to seconds; but this substance has no such influence in the other processes where moisture is present, as in collodion, albumen, or the paper processes.

Acetic Acid — Familiarly known as vinegar, which is very dilute acetic acid mixed with many impurities. Pure acetic acid is extensively used in photography, mixed with pyrogallic acid in the developing solution for negative pictures. Glacial acetic acid is the most concentrated form of this acid. Citric acid may be advantageously substituted for acetic acid in photographic processes. *Acetates* are combinations of acetic acid, with bodies of opposite qualities, called *bases*. Thus acetic acid added to soda forms acetate of soda.

Achromatic — devoid of colour. As in photography it is of the utmost importance that the visual and chemical foci should coincide, it is the object of the optician to produce a lens in which this result is obtained. It is accomplished by forming a compound lens of glasses of different degrees of density, and by a proper adjustment of their curves, by which the "wandering" coloured rays composing the image are collected together, in, or nearly, one plane, thus producing achromatism. It is a subject attended with many difficulties, and it is even asserted that it is impossible to make the chemical and visual foci coincident, except for one given condition.

Acid — Acids are substances which are generally sour to the taste; and which change vegetable blue colours to red. Acids are organic and inorganic. They enter into chemical combination with alkalies or other bases, and form bodies with entirely different properties to either, as when sulphuric acid is mixed with magnesia, sulphate of magnesia or epsom salts is the result. The principal acids used in photography are the acetic, citric, gallic, nitric, and pyrogallic.

Actinism — It has lately been discovered, that a ray of light possesses three distinct powers or properties, viz.: — the *luminous* or light-giving, the *calorific* or heating, and the *actinic* or chemical. It is, therefore, the actinic element of a ray of light that effects the remarkable changes in the substances submited to its action, which constitutes photography. Actinism exists chiefly amongst the violet and blue rays, and scarcely at all in the red and yellow rays.

Actinometer — An instrument for measuring the intensity of the chemical or actinic rays of light. Such instruments are also called *photometers*.

Affinity — A power possessed by chemical substances, of combining with certain substances in preference to others. Thus silver has a greater preference for chlorine than it has for nitric acid; therefore, when nitrate of silver is placed in contact with a chloride, it is decomposed, and chloride of silver is formed.

Albumen — Familiarly known as white of egg. It is extensively used in photography, both in the negative and positive processes. In the former, as a vehicle for coating glass plates with iodide of silver, a process invented by M. Niepce de St. Victor, hence called the Niépcotype process. In positive processes, albumen is used for coating the surface of paper, by which means proofs of greater delicacy and brilliancy are obtained than upon plain paper. It serves also as a varnish. Albumen forms a chemical compound with silver, called albuminate of silver, which is highly sensitive to the action of light. It is coagulated, or rendered insoluble in water by various substances, such as corrosive sublimate, nitrate of silver, &c.

(To be continued.)

New Books.

Lay's Photographic Almanack and Ready Reckoner for 1859.

A VERY useful compendium for the photograper, consisting, in addition to the Calendar and usual Almanack matter, of a collection of very useful tables, &c., a summary of the progress of photography of the past year, improved processes, new apparatus, obituary, &c., &c. The tables showing the relation between the size of object and image, focus and lens, and distance of object, are alone worth ten times the price of the Almanack, — a photographer would save that much time upon any occasion in which he essayed to take a view of a building.

Foreign Correspondence.

Paris, December 16, 1858.

I GLADLY respond to your invitation, to keep you informed of the progress of photographic science in this capital; and I am fortunate in being able to occupy my first letter with matter both curious and interesting. For the past month, practical photography has been a vain struggle against gloomy skies and foggy atmosphere (for we do have fogs here sometimes), consequently we have found ample leisure to pursue the theoretical.

Foremost in interest and importance, stands the third memoir on the action of light, by M. Niepce de St. Victor, which was read before the *Académie* by that honoured veteran in science, M. Chevreul. It is difficult at first to recognise the vast importance of this new communication, for it is given in a manner so free from pretension, that there appears nothing extraordinary about it. But when you ponder over it, you gradually become aware, that these discoveries extend the domain of photography to an unexpected and unhoped for extent, which becomes almost as vast as chemistry itself, as it is shown that every chemical action is capable of affording photographic effects; for take any soluble substance whatever, and impregnate a sheet of paper with it, and then expose it under a negative to the light; after sufficient exposure, move it to a dark room, and develope by some re-agent, capable of transforming the soluble substance upon the paper, and a visible picture results; the chemical action becomes photographic! The same result follows if the order of proceeding is reversed; that is, if the developer is first applied to the paper, afterwards exposed to the light, carried into a dark room, and then treated with the soluble substance with which the paper was impregnated in the first instance, the picture will appear as before. This result follows, not only with the salts of silver, but also with those of gold, with iodide of potassium, the prussiates of potash and of iron, the tinctures of turnsol of curcuma, &c., which become sensitive agents adapted to exhibit the effect of the action of light. The bearing of these researches upon the art of dyeing is very important; for we can now investigate with a sure clue the phenomena of fading colours.

M. Chevreul called particular attention to two applications of chemistry to photography. A sheet of paper impregnated with a strong solution of nitrate of uranium, exposed to light under a negative, afterwards washed in pure water, then treated with bichromate of potash, yields a picture of great beauty, resembling drawings in red chalk, and which becomes permanently fixed by washing in water. If the paper is treated with prussiate of iron instead of prussiate of potash, a very remarkable blue picture is

produced. In fact, pictures may be obtained of every colour and hue imaginable. Another process, which promises the most important results, and yields very fine positives economically, either black or brown, is as follows—a sheet of paper is impregnated with gallic acid, exposed under a negative to light, then treated with iodide of potassium, and afterwards with nitrate of silver: a very vigorous positive is the result.

Here are suggestions enough to employ the whole legion of photographers for the next six months; and now that positive printing occupies so much attention, we may expect very important changes in the method at present in vogue to follow very soon. I should add, however, some of the conditions under which these photographic phenomena present themselves.

In order that light may act effectively upon organic or inorganic substances it is necessary that they be in a state of minute division; and that an *organic* substance be present when inorganic matter is submitted to the action of light for a picture to be produced. When we operate with paper, of course the organic matter is present, but the experiment with the same chemicals, when performed upon glass or porcelain, does not yield a picture, although the inorganic substance is acted upon by light. Many substances, when acted upon by light, become insoluble to a remarkable degree, and they can be washed in quantities of water without dissolving. Moisture, especially when combined with heat, quickly destroys the action acquired by solarization, and renders them again soluble. In like manner, heat and moisture, greatly accelerate the reduction of metals under the influence of light.

As only the first part of this memoir was read, we may expect further revelations before long.

M. Roussin has suggested a new method of obtaining cyanide of potassium, in large quantities, by the double reaction, at high temperature, of nitrate and acetate of potash. At first sight it would appear that the acetate could be replaced by acetic acid, but such is not the case, for when the latter is substituted for the acetate, cyanide is formed in very small quantities or not at all.

An improved method of toning positive proofs, which has the recommendation of simplicity and excellent results, has been proposed by M. Bayard, at a meeting of our Photographic Society. It is as follows:—In a pint of water dissolve fifteen grains of chloride of gold, then add it in small quantities at a time, while stirring, to the following solution — water one pint, hyposulphite of soda eighty grains, hydrochloride of ammonium, or chloride of sodium, half an ounce. This mixture assumes an orange-red colour, but after a time becomes clear and colourless; it is then fit for use. It is better to wash the proofs from the free nitrate of silver when removed from the frames, but it is not indispensable. As soon as the proofs have acquired the desired tone, they are to be removed to a fixing bath, composed of hyposulphite of soda five drachms, water thirty-three ounces: this bath effects very little change in the tone of the proofs.

The third exhibition of the French Photographic Society is now postponed until April next. Works intended for exhibition must be forwarded not later than the 15th March next, addressed to the Secretary, agent of the Society, M. M. Laulerie, No. 11, Rue Drouot, Paris. The Society invites the co-operation of the photographers of all nations, so that a truly *universal* exhibition may be presented. The works sent for exhibition will be submitted to the examination of a jury nominated for that purpose.

Photolithography has of late made such progress in the hands of M. Poitevin, that four different illustrated works are now being printed by his improved method, viz., Labarthe's *Recherches sur la peinture sur èmail au moyen âge et dans l'antiquè: Serapium de Memphis:* Lottin de Leval's *Voyage in Egypte*, and Penguilly's *Description du Musée d'Artillerie.* Carbon printing is chiefly in the hands of Messrs. Salmon & Garnier, who lately exhibited some new specimens of their process on paper and on glass. Two of these were obtained from plain paper negatives in ten minutes, and in the sun's rays: the same effect is produced in thirty or forty seconds, with a transparent negative. Two others were obtained from glass, upon an albumen stereoscopic negative, the sensitive solution on the glass plate being made strongly ammoniacal, and diluted with a certain quantity of alcohol. Another proof also on glass is enamelled; that is, rendered ineffacable by heat, from the enamel-powder being dusted on the proof instead of carbon.

The quality of the proofs obtained by Messrs. Salmon & Garnier is remarkably fine; even when examined by the microscope, no *grains* are visible in the parts forming the picture, — nothing but a pure tint. Of the practicability of the process for commercial purposes, that is, in despatch and moderate price, it is shown, that every proof, on paper or glass, sensitized, exposed to light and carbonized, requires only ten or twelve minutes to complete it. The application of the carbon is so simple as to be easily performed by ordinary workmen, or even boys and girls. For my own part, I do not consider carbon printing successfully arrived at, until the carbon is effectively applied in suspension or solution; and nothing short of this will satisfy public demands.

J. P.

[In printing the letter of our correspondent, we think it necessary to observe, that we by no means adopt his sentiments. — Ed.]

Correspondence.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, George Shadbolt, 2, *Upper Hornsey Rise, N., London. All* Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

RESTORATION OF FADING PROOFS.

To the Editor.

Sir—I should feel much obliged if you could tell me of any way of restoring paper positives which have become yellow and are fading from time. I have one (the only print existing, the negative being destroyed) which I should like if possible to preserve: the features are rather indistinct, and it is very yellow. Thanking you for the reply to my last, I remain, &c. W. B. C.

Liverpool, 10th December, 1858.

[If we had a *certain* remedy for the fading alluded to, it would be a very great advantage, but we are not actually in possession of one. The following method is *sometimes* successful, but the fading described being due to sulphurization we are not confident of its answering in the present instance:—

Add a few drops of tincture of iodine to water until it is of a full sherry colour—float the faded proof thereon for from ten to fifteen minutes, wash well in water and hang it to dry. When nearly dry, or quite so, immerse in a saturated solution of gallic acid to which a few drops of solution of nitrate of silver has been added, say five drops to each ounce, the proof to have been previously exposed to light, when sufficiently developed wash in salt and water, and subsequently in plain water, and lastly iron with a pretty warm iron.—Ed.]

DRY PROCESS WANTED.

To the Editor.

Sir — Would you kindly favour me with an answer, in your very excellent *Journal*, to the following question? What is the best of sundry processes, viz.— the most convenient, quickest, and that which gives the best results, and what is the average length of exposure? I have made numerous attempts at the waxed paper process, and have not at all succeeded. One objection, the removal of which would be a great *desideratum*, is, that *I don't get any pictures*, or if I do, it is only the bare outline of the sketch. I have tried various ways and formulœ, but without success, exposing from five to forty minutes, to different objects. By the merest chance I once got one of the best waxed paper negatives I ever saw, but could not accomplish the same feat a second time; unfortunately the negative was destroyed. With apology for trespassing on your valuable time, I am, yours, &c.

December 20th, 1858. A. H. JACOB.

P.S. — Would you kindly give me a formula for a good toning bath.

[Either the collodio-albumen process, Dr. Hill Norris' gelatine process, Fothergill's, or else a modified oxymel process, by A. Whitham, will answer your purpose. You will find full particulars of Fothergill's process at pages 115, 144, 193, 207, and 241 of our last volume; and of Whitham's at page 301. It is not improbable that a deficiency of nitrate of silver solution, when developing, may have been the cause of your want of success with the waxed paper, as the exposure would appear to have been sufficient. You must remember, that without free nitrate of silver there is nothing to produce the picture. For toning bath see Mr. Hardwich's paper in the present number.

CAUTION RELATIVE TO THE CARE OF NEGATIVES.

To the Editor.

Sir — The truisms, "The longer we live, the more we learn," "Experience teaches wisdom," "We pay for learning," &c., all come into my head when on the point of telling you that you may let others know how, in one instance, they may save themselves from *paying for learning.* Hear my tale. I have several good plates — 12 × 14 inches — that have cost me some trouble and great expense, belonging to the background of a new composition. I took particular care of them, so that a few days

ago, I gathered them up and placed them in a box, a few *yards* from the stove in my glass room. Yesterday I wanted two of them, and though varnished, they were more or less peeling off, the result of numerous beautiful arborescent cracks.

We have had a week of fog, and the last two days heavy rain — so the warm room by day, and cold and damp at night and morning, has made the covered glass box into a most perfect and delicate steam or vapour bath, and doing the work gently and constantly, it made it more completely so. I warn others not to lock their plates up in deal boxes, where they are liable to great and sudden changes of temperature. Fifty other plates standing about have had no other damage than dust.

I shall be but a poor contributor this time to the exhibition. I have but *one* thing that has not been at my publishers and in their windows; for as soon as I make a good thing I send it off, trying to let it pay its own expenses. I intended this last fortnight to do something, but, from the constant fog that has enveloped us, I have been unable to carry out my intentions.

The only thing I have that has not been *out*, is a very good photograph from a sepia drawing after Raphael, that I lately made for H. R. H. the Prince Consort; yet, during the year, I have made many pretty good studies, but I could not afford to keep them locked up.—I am, yours, &c.

O. G. REJLANDER.

Wolverhampton, December 18, 1858.

[" *Nemo mortalium omnibus horis sapit*" — but when a wise man does commit a blunder, he usually rectifies it, as far as possible, immediately upon discovering it. Such has been the conduct of the council of the Photographic Society; and we trust that, ere these lines reach the eye of our correspondent, he will have been made aware that the objectionable regulation has been rescinded.—Ed.]

PHOTOGRAPHY FROM A BALLOON.

To the Editor.

Sir — I see it announced in a photographic publication, that it is proposed to extend the use of the camera to a new field of action, with the view of obtaining photographs from a considerable elevation above the surface of the earth, by means of balloons. As a photographer, I feel, that while we should do all in our power to extend the range of the art by suggesting new objects for its application, or communicating our own experience to each other, it is equally our duty to give any information which may tend to prevent photographers wasting their time and energies in directions in which our experience tells us no good result can be expected.

Having had a good deal of experience in ballooning, I beg to say that it will not be possible to use a camera or lens of any kind from the car of a balloon, for the simple reason that the machine is never in the same position two seconds together, and not only so, but the difficulty is greatly increased by the fact, that those in the car have no means of knowing the direction which the motion may take. It would thus be impossible for the most expert eye to follow it. Even in the case of a captive balloon the same objection applies, though in a different way. It is true that balloons have been used for purposes of observation in warfare; but the conditions necessary in the two cases are widely different.—I am, yours, &c. CHAS. W. SMARTT.

Pentonville, December, 14, 1858.

EARLY PHOTOGRAPHIC EXPERIMENTS.

To the Editor.

Sir — In your report of the proceedings of the Historic Society of Lancashire and Cheshire, in your last publication, Mr. J. T. Towson observes, "that in the early days of photography, say in 1838-39, when he and four others (Sir John Herschell, Mr. John, now Sir John Lubbock, Mr. Fox Talbot, and his friend Mr. Robert Hunt), were the only followers of the science in England."

I take leave respectfully to inform him, through the medium of your publication, that the art was early practised here by me, which the enclosed letter, taken from a Belfast paper, will more fully show, and the publication of which in your pages will still be of interest to photographers:—

" *From Belfast News Letter of September* 20*th*, 1839.

"The Daguerreotype. — On this curious subject, the following interesting letter has been addressed to us by Mr. Beatty, the well-known engraver of this town. We have also received the specimen to which he refers, and the effect noticed by him is extremely singular.

'To the Editor of the *News Letter*.

Sir — Being occasionally engaged since the announcement of M. Daguerre's extraordinary invention of fixing on silver plate or copper the minute images of external objects, produced by means of the camera obscura, after a number of experiments, I was somewhat surprised to find, that in using silver paper, the effect was different from silver or plated copper, although treated in a similar manner. Silver plated on copper, gives the true effect of light and shade — while silver on paper gives the opposite — namely, the light parts of the subject are dull, and the dark shades are, in a proportionate degree, light. In order to convince you of the fact, I send you a specimen; but our days of late having been cloudy, you cannot expect it to be as perfect as I would wish. I hope before your next publication to be able to submit to you a specimen on silver plated on copper, and silver on paper, in order that you may more completely understand the difference. Hoping that this communication may have the effect of promoting inquiry on the subject, I remain, your obedient servant, Francis S. Beatty.' "

Hoping that you will have room in your next for this and the republication of the letter — I am, yours, &c.

Dublin, Dec. 11, 1858. FRANCIS S. BEATTY.

UNCORRECTED LENSES FOR PHOTOGRAPHIC PURPOSES.

To the Editor.

Sir — In page 186 of your *Journal*, you state, that if a lens is not achromatic it is useless for photography. I beg respectfully to deny this. The best picture I ever produced was taken with a common meniscus lens; and after repeated trials I marked the tube as I would a spy-glass, so that I never had again to take the focus for a landscape, only put the lens on the marked line. The camera was always the same length, having no slide, and each distance was thus a constant quantity, near object, middle distance, and distance.

And if now about to buy a landscape lens, I should purchase a meniscus, three feet focus (the last I had was sixteen inches), as the distances are usually too great for short lenses, and the light lost in focal length is made up in a great measure by the increased size of the aperture which can be used; and the remarks about chromatic aberration may be met, by stating it is also constant, and a lens of this sort and a tin camera would cost but a trifle in England; the back being sloped, would rectify, in a great measure, errors in near objects.

The size that a lens of this sort would cover would be about eighteen inches, and the pictures are therefore more like works of ornamental art.

I am, yours, &c.

Geelong, Victoria, Oct. 18, 1858. A. K. SPARKES.

[It is evident from the preceding remarks of our correspondent that he is not well acquainted with optical matters, or he would be aware, that unless an object be *beyond* a certain considerable distance from the lens, it is *impossible* that the posterior focus can be a constant quantity; moreover, in an uncorrected lens the amount of allowance for variation of chemical focus will differ with every distance from the object, within certain limits.

The fact of the best picture ever taken by the writer having been produced by means of an uncorrected lens proves nothing, even if we suppose the picture to have been really a good one (as probably it was), because for *very distant* objects a certain point may be found, at which the allowance will remain tolerably constant, provided also that there be no variation *in the density of the atmosphere;* but with near objects this is very far from being the case.

In Victoria, subjects for landscape photography may usually be *distant:* in England, our difficulty is generally to attain a sufficiently distant point of view to include the whole subject.

It is an agreeable reflection, that the ties produced by the pursuit of our pleasant craft, should have drawn forth a letter even from the Antipodes upon mere matter of detail; and although we still maintain the same opinion as we formerly expressed — that an uncorrected lens is not *adapted* for photography — we have much pleasure in communicating with our distant fellow workers. — Ed.

ANSWERS TO CORRESPONDENTS.

P. Thomas — Send a specimen.

Amicus — We have the subject of photo-lithography under our especial notice at the present moment. It is one of which we have great hopes as regards utility.

Conservator — The best portfolio for drawings or photographs with which we are acquainted, is that patented by Mr. Harvey, of Rathbone Place, described at page 247 of our last volume.

J. S.— We shall be happy to answer any *photographic* query, but the other information would not be properly included in a photographic journal.

Thomas Davidson.—We did not receive your communication in time to prepare the Diagrams for this number, but intend to avail ourselves of it for our next.

*** Several articles in type are unavoidably left over till our next, among which is the conclusion of the paper on *Suggestions for the Improvement of Landscape Photography*, &c., by the Editor.

G———. In asking us for the radii of curvature of the various surfaces of the flint and crown glass lenses of the orthoscopic combination, together with a simple means of ascertaining the refractive and dispersive powers of various kinds of glass, it is evident that your acquaintance with the science of optics must be merely *nominal*, otherwise you would be aware that it would require many numbers such as the present to do what you require, even if we possessed the exact knowledge and will to impart it. The various curves, of course, must depend upon the properties of the particular samples of glass employed, together with certain data which Professor Petzval has *not made public*. — To ascertain the refractive and dispersive powers of glass, it is necessary to construct a prism of the glass to be tested, though the latter quality is ascertainable with sufficient accuracy for practical purposes by the finding specific gravity.

THE PHOTOGRAPHIC JOURNAL.

No. 86, Vol. VI.—JANUARY 15, 1859.

We scarcely know whether we ought to regard it as an affront or a compliment that the *Journal of the Photographic Society* made its appearance upon the occasion of the last issue with a similar prefix to its title to that borne by our publication; but as we were clearly the first in the field to announce the intention of adopting the designation of "The Photographic Journal," we presume that we must look upon it in a complimentary light. One thing, however, appears very clear, that the alarm recently expressed relative to the probability of the public being misled by our change of title, into the belief that in supporting us it would be supporting the *Journal of the Photographic Society* must have *altogether subsided*, otherwise the conductors of that excellent publication would scarcely have ventured upon a step *calculated to increase* such confusion, did any exist.

With regard to the change on our part, we have been much gratified with the numerous letters expressive of satisfaction thereon received by us; we have, however, *one* solitary instance to the contrary, so in this, as in other things, the rule is not without an exception.

Perhaps the most interesting event that has occurred in the photographic world since our last, is the opening of the Exhibition of the Photographic Society at the Suffolk Street Gallery, which was honoured, on the 6th instant, by a visit from the Prince Consort. We have no doubt that it will be a matter of considerable gratification to every exhibitor, to learn that H. R. H. very minutely inspected the whole of the collection, and evidently regards the productions of photographers with an eye of affection. Scarcely a single picture amongst the whole was passed without at least transient notice, and the more meritorious works were carefully examined. We question whether there are many private gentlemen, photographers though they may be, who take as much trouble to be certain that nothing of importance escapes examination, as this illustrious visitor underwent on the occasion specified.

Another source of satisfaction to the exhibitors may be found in the fact, that besides having a strong bias in favour of the photographic art, its results are clearly understood and appreciated by H. R. H., not merely in a general way, but with an intimate knowledge of the various minute details of nearly all the processes employed in their production, and this to such an extent, that we found we could almost certainly predict where a longer pause than usual would occur as he approached the neighbourhood of any work, either particularly excellent or possessing any unusual peculiarity. We may remark *en passant*, that the present exhibition is in our judgment a very fine one, and that the labours of the hanging committee have been crowned with a success never before attained at any previous one, not even excepting that of last year at the South Kensington Museum.

As will be seen by our report of the last meeting of the Photographic Society (London), Mr. Pouncey has now made a clean breast of it, and explained the details and *modus operandi* of his process. Although we cannot perceive therein any thing whatever to warrant the proposed intention of securing by patent the exclusive use thereof—seeing that all the essentials have been already included in several other patents, in M. Poitevin's in particular, not vaguely, as has been asserted, but absolutely—still we are of opinion, that something more than the thanks of photographers are due to Mr. Pouncey, for opening up what may in time prove to be a very valuable field of research in the effective application of carbon to the purpose of printing photographs upon paper.

We were certainly surprised to see the great advance that had been made, in the space of only one month, in the improvement of the specimens submitted to the meeting; for although in our 15th December number we pointed out a direction in which we thought operations might be carried on with a reasonable expectation of some success, we certainly did not anticipate so great an amount of it in so short a period as that which we witnessed last week.

Some of the best of these pictures (of which by the way specimens will be found in the exhibition) were from a negative of Dr. Diamond's, containing several small figures accessory to the principal subject, which is an architectural one, being a portion of some ruined abbey, and well suited to display the favourable points of the process. For subjects such as this, very pleasing and satisfactory results can be obtained; but in order that we may not mislead others in this matter, as a contemporary has thought fit to do, we assert emphatically, that even now the proofs are *not* equal in beauty to silver prints from the same negative. This statement ought not to be any discouragement to Mr. Pouncey: he has done much, so much that he can afford to wait with patience while the rest that has to be accomplished, in order to bring up his process to a level with the silver process, shall be worked out, either by his own exertions, or by the willing aid of many that will have been by this time enlisted in the cause.

That we may not be thought to bring a vague accusation of deficiency, we may remark that the points still wanting are precisely those which we have before noticed, but now in a less degree than formerly, viz.—insufficiency of half-tone, and partial absence of atmospheric effects. We need not however pursue the subject further here, as those who feel interested therein will doubtless read the report of the discussion which occurred at the meeting on the 4th instant.

It is a matter of no little surprise to us that there still appears to exist in the minds of some photographers a confusion of ideas relative to the subject of carbon printing, photographic engraving, and photolithography,—all of them important in their special provinces.

In our last we made some allusion to these subjects, more especially with regard to the latter. Since then we have given a good deal of attention to the question of how it may be possible to call in the aid of any or all of these processes, by way of *economy*, in correctly illustrating certain works; and we confess, that to our thinking, the plan proposed by Herr Pretsch, as described in the present number, appears worth a trial. The odium under which Herr Pretsch's process has hitherto struggled, has arisen chiefly we believe in consequence of his

claiming, or having been thought to claim, for it more than its just due: he now admits, and probably did before, that his plates do generally require some assistance from the engraver. So long as that is admitted we see no harm in it; the fraud of its concealment only would be offensive; and though we may fairly wish to do without the engraver at all, there is no sound reason why, if we cannot entirely dispense with his services, we should not, if we can do so, perform nine-tenths of his labour by photography. It must be borne clearly in mind, then, that the object in view is not competition with photographic printing, but an attempt to employ photography in aid of engraving, and thus combine the accuracy of the one with the advantages of the other.

Herr Pretsch meets the objection, that the plates produced by his process, in consequence of their delicate nature, can only yield a comparatively small number of impressions, by suggesting that each of those impressions, by transfer to a lithographer's stone, can be multiplied a thousand fold; and though perhaps some of the more delicate parts may thereby suffer some deterioration, there is no difficulty in rendering them nearly, if not quite, equal to the original by a few touches on the stone itself,—a comparatively inexpensive operation,—thus producing a large number of useful and valuable plates at a very small cost.

We confess that this argument appears to us so feasible that we purpose making an endeavour to put it in practice, and if successful, *present our readers with a specimen of the result with our next number on the 1st of February.*

With regard to photolithography proper, we desire to direct notice to some remarks made by Mr. Hannaford on the subject at the last meeting of the North London Photographic Association, in which that gentleman stated, that from experiments in which he had been engaged, he felt convinced, that the most promising direction in which photographers might direct their operations on stone, would be by first coating the stone with some greasy substance *before* application of the sensitive coating, then by removing the unhardened gelatinous or other organic matter, and the grease covered by it, with the assistance of benzole, ether, or other solvent of fatty matters, and subsequently the hardened gelatine, which, as Mr. Malone observed at the London Society's meeting, is only comparatively insoluble, and thus the desired image would be formed by a greasy substance in the stone, which will be in a condition to receive the corrections and additions of an ordinary lithographic artist, a condition in which few of the stones are left by the photolithographic processes at present in use.

Mr. Pouncey also pointed out that where a negative is employed direct upon the stone, the ink adheres not to the stone itself, but to the hardened organic matter associated with the sesquioxide of chromium upon it, and is thus liable to be readily flaked off in the process of printing therefrom.

We hope to enlist a considerable number of experimentalists in this very useful application of photographic art to practical purposes.

"PHOTOGALVANOGRAPHY," AND ITS ECONOMICAL APPLICATION TO BOOK AND OTHER ILLUSTRATIONS.

By Herr Paul Pretsch.

I will not trouble you here with a long description of my process, it has been explained in several papers. A glass plate, coated with a gelatinous substance, mixed with photogenic chemicals, is exposed in an ordinary copying-frame, with the original in contact, to the influence of light. The original may be a positive photograph on paper, made a little more transparent by some Canada balsam, or a drawing or print; but at all events, it must be transparent enough to allow the light to act through it on the coated glass plate. Very good results are obtained from originals on glass, but they must be transmitted *positive* pictures, not glass *negatives.*

The time of exposure is extremely varying, according to the transparency of the original and to the intensity of the light. After sufficient exposure, proved by practical experience, the plate is taken from the copying-frame, the original remaining unspoiled; and it shows a faint negative copy of the picture, made up of lights and shadows, on the smooth surface of the sensitive coating. The plate is now placed into a bath, and the picture appears almost instantly, as if by magic, transformed into a raised surface, in which the elevation and granulation of the different portions are in exact proportion to the intensity of the shades in the original picture. It seems as if the effect of light on the film were at once to darken and to harden it, so that those portions which have been fully exposed to the actinic rays—namely, the lights of the original—are almost impervious to the liquid of the bath; while in the dark shades of the original, this effect has been scarcely felt, and the liquid entering freely, *swells* the gelatinous compound, and causes its surface to rise.

All the tints of the photographic original are reproduced by a brilliant and wonderful granulation. This granulation is a peculiarity of my process, and it is indispensable for the reproduction of any tint by a printing plate. We can only print from a plate in lines, where the picture is represented in more or less fine and close granulation. It is not sufficient for an intaglio printing plate to represent the picture in sunk portions; but these sunk portions must consist either of sharp lines or granulations, for the purpose of retaining the printers ink. This required granulation is formed by my process itself, but a contemporary of mine is compelled to produce it by applying on the coating of the plate the dust of a resinous substance, well known to engravers, under the name of aquatint grains.

If however the original consists of lines—as, for instance, in a pen-and-ink drawing, or in an impression from an etching—the copy appears also in lines, perfectly corresponding to the effect of the original.

The beautiful granulation is perfectly capable of reproducing the tints of the original, if they are in existence, and decided enough to be recognised; but from a vague undecided original I certainly cannot produce a brilliant engraving.

Having obtained the coated glass plate with the raised picture on it, produced by the process just described, there is nothing more wanted than the transformation of such a plate into solid metal to print from. And this transformation *has* been executed, by taking a mould in gutta percha from the picture on the coated glass plate; and a faithful mould too, showing all the delicate portions of the first plate as well as the stronger ones. But this mixture of gutta percha, with some greasy substance, is not the only one that may be used. According to circumstances, mixtures of wax, pitch, stearine, resinous substances, &c., can be successfully applied.

The picture on the glass plate being raised in the mould, consequently appears sunk or intaglio; so that were the *material* suitable, the mould would be fit to print from. In order to obtain the ultimate printing plate in copper, a double electrotype process is necessary—a process which although not very new, is nevertheless one of the wonderful inventions of our own time.

The surface of the mould is prepared and rendered conductive of electricity, by plumbago, by bronze powder, or by a film of silver; and in such a state, surrounded by a wire or band of metal, the mould is fit to be placed in the electrotype apparatus for the purpose of obtaining by deposit a firm sheet of metal upon it. The reverse of the mould, therefore, like the picture on the glass plate, is raised. This is called the matrix, because it serves for the purpose of making the intaglio printing plate from it, by repeating the same process of electrotyping.

Any person conversant with the electrotyping process, will be perfectly aware how certain we are by these means to obtain a true and faithful copy of the original. As an instance, permit me to mention, that if we touch the mould or the bright surface of the matrix with the finger, and obtain by doing so an impression of our skin on the polished surface, such an impression is faithfully reproduced by the electrotyped copy. Therefore, we ought not to be afraid of the complication of the process, because the same process of moulding and repeated electrotyping is applied in the nature-printing process, in multiplying engraved plates of maps, and of bank-notes, under circumstances where the utmost accuracy is indispensable.

The process has the advantage of consisting of several distinct operations, which are independent of one another, and most of which may be performed at any intervals of time that may be convenient. The original photograph need not to be used for months after it is taken; the coated glass plates, even with the picture on them, may be preserved with care for a great length of time. The mould will keep almost for ever, and the copper matrix will yield any number of precisely similar plates. The gelatine and the chemicals are comparatively inexpensive, and the glass plates may be used over and over again, any number of times. The most

costly part of the process is, therefore, the electrotyping, the expense of which varies according to the thickness of the plate required — from 1½d. to 4d. per square inch.

Objections Refuted.

Two objections have been brought forward. The first, that many of my plates require to be touched by the engraver; and this has been regarded almost as a *crime* of mine, done secretly and concealed. Now it appears ridiculous to attribute to me a crime that is done constantly by photographers who take portraits, which are generally touched up. Moreover, I know one of the first copperplate printers in London, who is constantly engaged in mounting photographs, because he possesses such a peculiar and very nice *sort of glue*, which answers so very well for the purpose, that I have seen some photographic landscapes which had shown, *unmounted*, many faults, which, however, have been imperceptible after having been mounted with this *very admirable glue.*

I readily admit that many of my plates have been really touched by the engraver — in many cases more than was necessary, more than was wished for. But as a small proof of my sincerity, I have deposited, out of sincere respect to this country, and as a record of what was really executed here a few years ago, a series of impressions from *untouched* plates, in the print-room of the British Museum. The successful application of my invention will be bounded by the same limits as those which circumscribe the power of photography itself. A subject which is not well adapted for photography cannot give a good photogalvanographic picture. You are at fault in the first stage of the process, and the subsequent operations will do nothing but repeat the original imperfections. I cannot reproduce an engraved plate, as required by the taste of the public, from an original which is wanting in definition. There are many photographs with a veil over certain portions of their details; the public is content with them, because they are covered by the fascinating rich tint of photography, and because they allow to the imagination of the spectator free play for his ideas. But the public is not satisfied with this undecided definition in an engraving; they will *see*, and *know*, and *understand*, what there is represented. Therefore only perfect originals, with clear definitions, ought to be used in my process.

In many instances, the capability of being able to touch up is of great advantage. Who would not like to remove a stain from an otherwise brilliant picture? Before rejecting the picture altogether, he will certainly at first try to remove the stain. Why shall we not give a tint to the sky, which is generally white in a photograph? Some of the plates do not require a single touch, though many have to be cleaned and rubbed down before they are in a fit state to print from, and some are very much improved by touching up here and there. But the greater part of the work is done when the plate comes out of the electrotype apparatus; and a plate which would take the engraver twelvemonths of unremitting labour to execute, can be turned out by my process, allowing ample time for any touching up that may be wanted, in a few weeks, with trifling expense, and particularly so in comparison with handwork. Thus, the mere saving of highly skilled labour is immense, and what is of more consequence, the touch of nature's own finger is preserved, and an accuracy is attained, to which any mere mechanical skill must of necessity be inadequate. I can and will not compete with the brilliancy of the engraver's tricks in steel engraving; but I can compete, in every respect, in truth and faithfulness. The main point is, to apply as little touching as possible, and if indispensable, to apply the same JUDICIOUSLY.

The *second objection* which has been brought forward against my process is, "That my plates do not allow a sufficient number of impressions to be taken from them." But I will show that this also is unfounded.

1st. At present almost all engraved plates are executed on steel, consequently the printer is more experienced in handling them than copperplates. The process of "wiping" ought to be done in such a way, that it is not like "grinding" the plates. Even in keeping engraved copperplates, attention ought to be paid to protecting them against the injurious influence of oxidation by the air. By neglecting this, we may spoil the plate to some extent, and lose fifty good impressions at once; and by the want of the required attention in the wiping, we may lose some one hundred more. I have met with some instances where I have obtained from similar plates several hundred impressions more by one printer than by another.

2nd. Everybody conversant with the process of electrotyping, knows perfectly well that we are able to produce, at will, hard, or soft, or brittle copper, according to circumstances.

3rd. It is well known to some, that there is in existence a process for hardening electrotyped plates, which is in constant use at the Ordnance Map Office in Southampton, and that plates so hardened produce at least some thousand impressions.

4th. A new process exists now for covering copper plates with a very thin film of iron, thus making them capable of yielding almost as many impressions as steel plates. I myself do not yet possess any experience in this process, but I have no doubt that it is a considerable improvement for engraved copperplates.

5th. A very practical advantage can be obtained by making from the copperplates transfers on stone. By this mode we keep the copperplate always in a good state, and print only from the stone.

A great number of impressions can be obtained in this way; and although the impressions from the stone are perhaps a little less perfect than would be from the original copperplate, nevertheless this method will answer perfectly in many cases.

ON DRY COLLODION PROCESSES.

By Dr. Hill Norris.

A thorough comprehension of the fundamental principles of dry processes is the only guarantee of a fair proportion of success in this branch of photography. It is not sufficient to possess recipes and formulæ; for photography, like physic, cannot boast of specifics. The remarkable list of substances which stretched ingenuity has suggested to preserve the capillary condition of the collodion film is a witness to the fact, and evinces the almost total want of fixed principles to guide the photographer in a proper selection. We must hope that this empiricism, so fatal to true progress, will ere long give place to a more philosophic spirit.

It is proposed to-night to discuss the subject of dry collodion under four separate heads, viz. — Adhesion of the film, sensibility to actinic influence, retention of the invisible image, and developement, as under these four divisions the entire phenomena of dry collodion may be treated.

First, then, adhesion of the film.—Non-adhesion may occur in two ways, viz.—by blistering and by stripping or washing up. The former is peculiar to preservative substances, the latter to collodion, without any superincumbent adhesive substance. The blistering results from the preservative substance expanding when wetted. The stripping up, or washing off, is the normal condition of a simply washed and dried film of collodion; to steer between these two conditions is therefore clearly our course, avoiding the blistering on the one hand and the fragility of film on the other. Fortunately this is easily accomplished, as collodion will bear a sufficient amount of expansion, and at the same time a very small amount of gelatine or albumen will confer stability on the film.

Applying these principles, if a given collodion rises in blisters, with the application of a four grain solution of gelatine, all we have to do is to reduce the strength to two grains, or even less, as one grain is amply sufficient for conferring stability on the film during the various subsequent aqueous operations. It must be understood, that all these remarks refer to dry processes properly so called, as from this category all such are excluded as contain substances having marked hygroscopic properties, or in a word, all such as will not bear moderate friction with the hand when dry. It has been said that the coagulation of albumen in the film prevents blistering; but this appears to be an error, for if any strength of albumen be left on the plate, blistering will undoubtedly occur. Meta-gelatine has also been advocated on the ground that it might be applied cold; but my experience contra-indicates the application of cold solution as likely to give 50 per cent. of stained plates by an incomplete removal of the nitrate of silver, which being dried in the film is reduced by the pyrogallic acid. Meta-gelatine, in the hands of amateurs, probably gives greater freedom from blistering, owing to its fluidity and a smaller quantity being left on the plate; but this is counterbalanced by the tenderness of the film, *i. e.*, its liability to strip.—We now pass on to consider the sensibility of the dry film to actinic influence. The greatest degree of sensitiveness with which at present we are acquainted exists in the most exalted conditions of the wet collodion film; and as that film is saturated with free nitrate of silver, photographers have generally imagined this to be the direct cause of sensitiveness, and that its partial or complete conservation in the film would confer the much-to-be-desired end, forgetting that the state of the nitrate in a dry is totally different to that in a damp process. By the use of organic substances, it is quite possible to retain the whole of the nitrate in the film without decomposition; but it no longer exhibits its peculiar influence as in wet processes, nor is it correct that the existence of an organic salt of silver (as the albuminate) confers

any sensibility. The fact is, neither nitrate of silver or any organic salts of this metal have any direct action in the sensitiveness, but the former acts in an indirect manner, by preserving the *integrity* or "*intact condition*" of the compound on which sensitiveness depends.

The maximum sensitiveness of a dry plate from any given collodion, is obtained by simply washing such plate from the nitrate bath with distilled water and drying. No preservative application capable of complete dessication at present known, no matter how applied, has the slightest accelerating effect; but, on the contrary, many substances so employed have a distinct *deteriorating* tendency. Gelatine and albumen are in this respect perfectly neutral, but the latter so only when its affinity for metallic salts has been satisfied, as under other circumstances it tends to the destruction of the sensitive compound, ultimately reducing the plate to complete insensibility. Looking upon moderately sensitive collodion as uniting plates without any preservation, or preserved with gelatine or albumen, will be represented by six, or in other words, will require six times the exposure. It was not my intention here to enter into the chemical nature of the sensitive compound, as this, with the nature of the invisible image, will be found fully discussed in a paper preparing for the Royal Society of Edinburgh; but as the subject has been alluded to, I will call your attention for a moment to the composition of the iodide used in photography. On precipitating iodide of silver by double decomposition, taking care to retain an excess of silver salt, we have a decidedly yellow precipitate, and on repeating the experiment with the alkaline iodide in excess, we have a white salt. On the very outset of our inquiries we observed their physical difference, and numerous subsequent experiments have led me to infer, that instead of there being only one compound of iodide of silver in use in photography, there are no less than four. The composition of which may be thus expressed—

$Ag.\ I + Ag.\ O, NO_5$	The collodion albumen of paper compound.
Ag, I	The daguerreotype compound.
$Ag, I + K I$	The insensitive iodide of chemists.
$Ag. I^2$	The precipitate with free iodide in excess, also insensitive.

Or in other words, the most sensitive compound of iodide of silver consists of one equivalent of iodide of silver, plus one equivalent of nitrate of silver. This salt, in an amorphous condition, but not so sensitive, may be crystallized, as shown by Schauss, and is still sensitive as in its amorphous state. It is immediately destroyed on contact with free iodine or alkaline iodide, and is depreciated by water, but not absolutely decomposed, at least so long as the smallest proportion of free nitrate of silver exists in it. Indeed, iodide of silver and nitrate of silver cannot exist together without determining its formation. Alcohol does not decompose it; hence, if the free nitrate of silver were soluble in this menstruum, and could thus be removed and a preservative substance applied, itself having no tendency to decompose this compound, we might make a dry plate as sensitive as wet. The daguerreotype compound comes next in order of sensitiveness, but is far inferior in this respect to the former compound, the ratio being about one to thirty. By a peculiar combination with bromine, its sensibility is well known to be exalted, but even then it does not reach the sensitiveness of the former compound. The remaining salts are both nearly, but not absolutely, insensitive to light, but so much so as to render them useless in photography. Some explanation may here be necessary as to the various degrees of sensitiveness found in collodion albumen and paper processes, but as we have seen that mere washing interferes with the integrity of the compound, it may be readily conceived how certain substances, by introducing special affinities, diminish the sensibility; and this is borne out by the fact, that where the conditions are the most perfect for preserving this compound, we have the greatest sensitiveness, owing to the presence of excess of alcohol, æther, and nitrate of silver.

Retention of the Invisible Image — Dry collodion plates possess the singular property of returning perfectly to their former sensitive condition, after having been exposed, if kept for a sufficient length of time in the dark. Extraneous conditions influence, to a great degree, the rapidity with which this occurs, requiring as it does sometimes months, and at other times weeks only. Damp or moisture assists materially this action; and therefore damp processes must be expected to fail in this particular. The thickness also of the preserving pellicle modifies the result; for if thin, this phenomenon occurs more rapidly, probably on account of the readier access of moisture, the presence of which appears to assist in the reversion of the chemical changes induced by light. This will at once indicate the impropriety of setting aside preservative substances, even if collodion could be made to develope well without them. Minute proportions of the vapours of iodine, bromine, acetic, nitric, and sulphuric acids, also destroy the image; but as some of these remove also the sensitiveness of the plate, their action is not analogous to the spontaneous return of the exposed compound to its normal condition, and is referred to here as a caution against keeping exposed plates amidst the emanations arising from a well-stocked laboratory.

Developement—In developement as in sensitiveness, the wet plate is our model; and certainly the best test of a really good dry process, is the ease, rapidity, and cleanliness with which it developes with pyrogallic acid. Inferior processes may yield tolerable, or even good, results by the slower method of developement *with gallo-nitrate*. It may be stated as a rule, that no plate should occupy more than five minutes in its complete developement, and should not require the developer to be renewed more than once. The greatest objection to the use of albumen, as a preservative substance, is the fact, that when coagulated, it resists the permeation of liquids and prolongs materially the developement. This does not apply with equal force against collodio-albumen, as the particles of coagulated albumen have not that continuity, or do not form a skin over the iodide.

It has been shown in former papers, that brilliancy and intensity depend almost entirely on the porosity of the film, and that this condition was common to collodion long iodised.

It has been recently suggested to bring about this condition by means of ammonia, and if from five to ten minims of strong liquid ammonia be added to twenty ounces of plain collodion, in about a week the pyroxyline undergoes a change, technically known as craping, the film being visibly opened — if now a small proportion of new collodion be added, just sufficient to remove the openness, we have a product suitable for dry work. The collodion so treated should contain more than the usual quantity of pyroxyline, and should be iodised freely as the action of the ammonia renders the collodion thin and fluid.

In conclusion, I must allude to the importance of temperature in developement, as cold entirely suspends this action; therefore in cold weather it is necessary to pay special attention to this particular, and if the chemicals are below 60°, to warm them artificially, and also the water with which the plate is wetted.

ON A FORM OF MAGIC LANTERN ADAPTED FOR EXHIBITING PHOTOGRAPHIC TRANSPARENCIES.

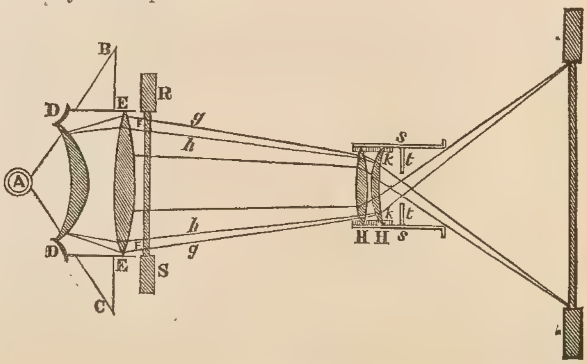
By Thomas Davidson.

Perceiving that considerable interest has of late been shown in the adaptation of photographic transparencies to the illustration of lectures, by aid of the magic lantern, the following hints relative to the best arrangement of lenses, to ensure good definition and flatness of field, may possibly be acceptable.

I may premise, that my long experience as a working optician enables me to speak from a practical acquaintance with this particular subject, to which I have devoted much attention.

The following arrangements will be found adapted for the oxyhydrogen, oxycalcium, Bude, argand oil, or indeed any of the usual sources of illumination:—

For many years a noted London firm adopted a principle that was a great improvement on the old school, but retained some serious errors in their illumination, which I will point out and then show my own improvements.



Let A represent the burner or lime light, D D a deep meniscus, and E E condensers, either in oxyhydrogen, lanterns, or micro-

scope; now the rays A D B, A D C would form the great angle A B C, but falling incident on the deep meniscus at D D, will be bent or refracted to the edge of the second condenser E E, and so on to the object glasses—the red light in the direction g k, g k, and the violet in the direction hk, hk. I should observe, that the ray A D, A D will be separated as shown by the refraction of the deep meniscus, but the red light will fall nearest the edge of the lens E E, where its refraction is strongest, and thus make up for the lesser refrangability of the red light. H H is the compound object glass, consisting of a crossed convex and a meniscus lens, recommended by Sir John Herschel as being freest from spherical aberration; S S a brass tube, carrying the object glasses and the stop t t.

The merit I claim on this principle of condensers is the great intensity of light obtained; the distance between the condensers should be equal to the difference of their focal lengths, as in the Ramsden's positive eye-piece, which is nearly free from aberration, and gives a flatter and larger field than others. I should also observe that the curvatures of the deep meniscus particularly, as shown in the diagram, is not so deep as it might be.

Next, as regards achromatic object glasses for lanterns, I have fixed on a formula which I am working, and will let you know the result.

My aim, however, is to show the superiority of the principle; and although it is good, yet with such deep curvatures it cannot be expected to be *perfectly* free from spherical and chromatic aberrations—it is only as near an approximation as we can arrive at. The light must be moveable, so as to slide backwards or forwards, until the disc is seen finely and regularly illuminated.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary general meeting of this Society was held on January 4th, 1859, ROGER FENTON, Esq., in the chair.

Mr. POUNCEY read a paper descriptive of his carbon printing process:—He uses, first, a solution of gum-arabic about the consistence of oil; secondly, a saturated solution of bichromate of potash; and thirdly, some of the finest carbon (such as is employed by makers of printing ink), ground very perfectly with water. Plate paper, well cylindered, is covered by a mixture of equal parts of the two former solutions, with about one-eighth of the ground carbon added. It is to be laid on by means of a large camel's hair brush, and allowed to remain on soaking for two or three minutes; the superfluous material is then removed by means of a brush, known as a four-inch hog hair softener, using it so as to leave a smooth surface. When dry it is fit for exposure under the negative, after which it is put to soak, face downwards, in water for about six hours.

A variation in the proportions of the materials is required to suit the various negatives used, as well as regulation of exposure. If the black parts come off in flakes, more bichromate should be used; if the whites are not clean, more gum; if the shadows are too grey, more carbon. Of course the converse of these propositions also holds good; and it is scarcely necessary to intimate to photographers, that the paper must be prepared in chemical darkness. There were sundry remarks upon "a change having come o'er the spirit of Mr. Shadbolt's dream," and others upon Mr. Malone's observations at the previous meeting about photolithography.

Dr. DIAMOND — The Rev. Dr. Holden was here to-day, and is unable to attend this meeting, but wished this letter to be read this evening.

The letter was read, and pointed out the deficiency of gradation of tone and atmosphere as compared with silver prints, and stated that another impediment to the use of the process amongst amateurs, consisted in the absence of any visible impression after exposure in the pressure-frame, thus rendering it extremely difficult to ascertain when the proofs are sufficiently acted upon.

The SECRETARY, after reading the letter, said — I may make one observation in respect to it, that having seen Mr. Pouncey operate, I could perceive, even on a very dull day, effects produced by the operation of the light which Dr. Holden does not appear to have observed.

Mr. POUNCEY — May I be allowed to say one word with respect to half tones. These pictures are all printed from a negative which Dr. Diamond has kindly lent me, and it cannot be said that there is too great a contrast there between lights and shadows.

A MEMBER — May I ask Mr. Pouncey if the remarks of Dr. Holden can be satisfactorily answered—that is, whether there is sufficient evidence on the face of the picture of the proper length of exposure in the pressure-frame?

Mr. POUNCEY — I think Dr. Diamond partly answered that question, when that gentleman said he saw me operate on a very dull day. I could not positively assert that you could *always* see it; but I can assert that you can invariably, if exposed to the sun. Suppose it had been exposed three hours to-day and found sufficient on going into the water, I should not be able to observe it; but having printed from that negative, I can tell how long another proof from it requires.

Mr. MALONE — Mr. Chairman, I believe that I was the occasion of bringing on this discussion; and many remarks have been made to-night by Mr. Pouncey, which perhaps I may be permitted, very briefly, not to meet *seriatim*, but to dispose of generally, and I trust satisfactorily.

Mr. Pouncey deprecates the having mixed up the two subjects of photographic engraving and the carbon printing. Now, I would ask Mr. Pouncey to learn that the occasion of the subject being introduced here, was the exhibition of specimens of Mr. Fox Talbot's works. I brought specimens of Fizeau's process of engraving and of photolithography by Monsieur Poitevin, with a view of comparing them with Mr. Talbot's engravings. Having thus elicited an interesting discussion, it was thought desirable that it should be adjourned, and that we should import into the subject the question of carbon printing, so that it is Mr. Pouncey who is out of order. That is the truth with regard to the origin of this discussion.

Mr. Pouncey does not seem to be satisfied with the manner in which I explained the photolithographic process. His remarks arise partly from misapprehension. Monsieur Poitevin kept secret his method of manipulation; and I do not think that my remarks deserve to be met as they have been by Mr. Pouncey to-night. I observed that we do not know the *exact chemical action* in any of the processes. These are proper remarks to make, and ought to be met in a fair spirit. With regard to the insolubility of the substance, it is a question of comparative insolubility. I stated before, that we *can* dissolve off *all* the bitumen, and so we can the carbon. Mr. Talbot, by water, removed certain parts of the gelatine which were not acted upon by the light. I made the remark that it was a consideration whether we put the positive upon the stone or the negative. I was then told we could not put a negative on the stone without reversing the plate. Mr. Pouncey is probably unaware, that by using a prism in the camera we can obtain a reversed negative (adapted for use) directly in contact; therefore that is only a question of convenience and time.

I have no desire to act the part of an opponent of Mr. Pouncey in any way. I looked at his pictures very carefully, and it appeared to me that the carbon print did not exhibit the phases of half-tone and atmosphere equal to the silver print. I at once said so. I was then shown other prints—two in particular—one of a purplish black and the other of a warmer colour. Upon looking at them, I thought that which I did not like to utter; I thought they were both very indifferent photographs, and that an attempt was being made to discover what skill I had. Mr. Pouncey took advantage of my hesitation, and said I did not know the one from the other. Now, it is a disadvantage to us that the report of what I said was not revised; for I find it was stated that I said that they were both photographs that were shown. If I can be disabused of the belief that I cannot distinguish one from the other, that will settle the point in Mr. Pouncey's favour, and I will make the acknowledgment, for I have no opposition to carry out and no end to serve. Now, the whole controversy lies in a nutshell — it is the printing upon silver, upon any paper we please, *versus* printing by carbon or some other agent. Suppose for a moment that I cannot distinguish a good silver print, such as of a statue or a portrait—for I will not agree that a print of a building is a fair criterion; short of that, I will never be satisfied to give up the present mode of printing for the carbon printing, much as I desire to see the latter in full use. I find Mr. Pouncey is still labouring under the fallacy, that because of the earlier photographs, 80 per cent. have been stated to have failed, they must *inherently* fail; but do the present photographs fail? If they do not *necessarily* fade, I say, for present purposes, they are as good as carbon.

I will show to any gentleman a photograph printed in 1844, which looks as fresh and free from signs of fading as any of the present time. As long as that remains authenticatedly unfaded, we must acknowledge that silver prints do not necessarily fade. But I am met with the statement, that 80 per cent. have gone. Well, in 1844, we none of us knew the exact amount of washing

required. I know now that there must have been a trace of hyposulphite of soda left in every picture of that period, and yet in spite of that trace many of these pictures remain, and if so, what may we not expect with our present skill and knowledge of the past? Supposing for a moment that the carbon prints are equal to silver prints, then, is the carbon process or the silver process likely to be easier in its application? After washing, must we find out that it is done too much or too little? If that is the case, it is inferior to the present mode of printing; but if the carbon print will give you delicacy enough, then you will doubtless use that process.

Mr. SHADBOLT:—As Mr. Pouncey has made some rather pointed allusions to me, I presume I may be permitted to observe upon them. He says, *that a very considerable change has come over the spirit of the dream* with regard to me. Probably if that be the case, he will remember that when I first undertook to publish the remarks that might occur to me in connection with photography, I stated that I should not be backward in giving an opinion, although I might afterwards have to alter it, because one can only judge by the data before us, and not by those which might be before us in future. I have ever intended to state candidly my impressions at the moment of writing, and it is not because I have thought unfavourably of a process, that I should not, when convinced that I erred in judgment, admit that my prognostications were incorrect. With regard to a certain gentleman who has been mixed up with Mr. Pouncey in this matter of carbon printing, I think that the latter has experienced far more injury by this circumstance than by any thing I could have said, or any one else here have done, in delaying the publication of his process. The gentleman alluded to has claimed for the carbon printing process, (not as it is at present, but months back,) a position *fully equal to silver printing in its artistic effects*. Now although we have laid before us this evening some excellent specimens of the carbon process, I cannot yet allow that they are equal to the silver prints of the same subject; they are good, and, as I admitted the other evening, full of promise, but there is an absence of that atmospheric effect which is, in matters of art, a *sine qua non*. Mr. Pouncey has claimed for his process effects perfectly equal to those by silver printing. He will excuse me in saying, he is under a misapprehension as to what is meant by the expression half-tone; it implies a gradation in every phase from deep shadow to perfect light, and in this *(holding up one of Mr. P's exhibited prints)*, there is no true half-tone; the nearest approach to it is in *that* deep shadow.

Mr. POUNCEY:—I produce that picture as containing no whites.

Mr. SHADBOLT:—What you regard as half-tone is produced by *a slight granulation*. Now in a silver print there is no granulation; it is more like a softened wash of sepia, or of Indian ink. You will perceive that in this silver print there is under the circle a beautiful gradation from deep black to grey. Now a remark which I recently made, and which I should have made to Mr. Pouncey upon our last meeting was, that this carbon printing process offers a very material advantage, provided we can carry out a little more of the manipulating operations, in conquence of its presenting the possibility of using what we call *weak* negatives. My opinion is, that it will be found that negatives of that class are the best for the carbon printing, and they are precisely those which are the worst for silver printing.

I stated at the outset, that I did not think the carbon printing process presented favourable aspects, in consequence of the material employed—the bichromate of potash. In every species of photography which I have seen in which the bichromate of potash has been used, an *exaggeration* of light and shade has been the consequence. Mr. Pouncey has called attention to a statement that 80 per cent. of photographs will fade. I think that that is a remark made in an exceedingly loose manner, I will not say, by an exceedingly loose writer, the Rev. Dr. Holden; in his letter which has been read this evening, I think he expresses opinions in nearly the same words, certainly the same ideas, that I uttered and printed subsequently to the last meeting of this Society, with regard to the want of aërial perspective, or rather, want of atmosphere.

I will now address myself to the remarks of Mr. Malone. He seemed to take objection to a very practical point, which I think Mr. Pouncey has clearly explained, viz.—that if you make use of a negative, and by that means get the image upon the stone, the parts covered by the hardened organic matter are those to receive the ink. But in the process patented by, I believe, Messrs. Cutting and Bradford of Boston, the unaltered bichromate of potash, &c., is removed by means of soap, and consequently those parts of the stone are capable of receiving the ink.

I will now conclude with one or two questions to Mr. Pouncey. First of all, in his description of the mode of proceeding, he did not state the particular kind of paper which he thinks most useful; and secondly, although he mentioned that he removed the superfluous carbon with a brush, he did not name the kind of brush with which he did it?

Mr. POUNCEY:—In reply I may state first of all, with reference to taking a reversed negative, it is "necessity which is the mother of invention." When I wanted to get one, I did not employ a prism, but I coated a piece of glass, and then took another piece of glass, and with some gutta percha I fastened them together, and with small pieces at the angles to preserve contact, and put them into the camera the reverse way, so that I thus took my negatives as I wanted them. Gentlemen must not think that I am not up to all these dodges. I understand Mr. Malone to admit that 80 per cent. of the silver prints fade. May I be allowed to ask how many faded by the side of that one that remained in "the pencil of Nature?" Supposing that there were one or two left, will that prove that silver printing is perfect? I think not. Then I may be allowed to refer here to what was stated by a gentleman, I believe at one of the meetings of this Society: he produced a numbers of prints, and said, Look at these, I believe that the toning of those prints is due to hypo sulphite left in the paper; they have been to almost every climate in Europe, and they are as good now as then, so that here is the greatest puzzle. Can we gather from Mr. Malone's remarks that the hypo sulphite is not the cause of fading? Now with reference to Mr. Shadbolt's questions, I cannot give any definite name for the paper. I should call it a thick drawing paper, which is very absorbent; that [*holding up a print*] is a print which is prepared before pressing, the consequence of which is, that the block has stuck fast; the prints *here* are pressed before the solution is put on, and the whites are clean. The brush is what is called the four-inch hogs-hair softener, not a badger-hair. I worked first with the badger-hair, and had two, one of which was worn, and I found that upon laying that aside and using the other, I did not get such good results. It struck me therefore that a hog's-hair brush would do it better, and I found it so. Is there any other question?

Mr. DELFERIER:—It is not stated what the solution is.

Mr. POUNCEY:—Equal parts of saturated solution of bichromate of potash and a solution of gum-arabic—I cannot give you any definite rule for the proportions. I dissolve one ounce of gum-arabic in three ounces of water; by the time that is half used, some of the water has evaporated, and I have been obliged to again make it thin enough. It is a solution of gum-arabic about the consistency of thin varnish, for if you have it too thick, the picture is more likely to break. The best proportion I know at present is equal parts. The advantage of my process in reproducing scarce engravings is immense Just ask any printseller in London if he has any very old prints, perhaps he will produce one no larger than THIS, and ask you twenty guineas for it, although it perhaps originally only cost a guinea.

Mr. SHADBOLT:—There is one point that to my mind gives more promise of success than almost anything else Mr. Pouncey has mentioned, and that is, that he finds it necessary to use varying proportions of bichromate with gum in order to follow up the varying density of his negatives—that shows it is under control to some extent.

Mr. SEBASTIAN DAVIS:—There seems to me to be a difficulty exactly corresponding with that of the ordinary photograph, I mean entirely to remove the sensitive solution from the paper, because the danger seems to me to be in the lights darkening. I could say that sometime since I was practically engaged in lithography, and I was then convinced that by no possible means could we get a photograph from the stone; for this reason, because there is always the difficulty of filling up the intermediate spaces, and nothing on stone will give the equal gradations of shade presented by the ordinary photographs, and this seems to me to be the insuperable difficulty.

Mr. DELFERIER:—It seems to be a question of whether the carbon can be brought to rival the silver in excellence, and not a question of permanency. We are here to discuss the merits of the carbon process and not the failure of the silver.

Mr. MALONE:—We have a double discussion, for Mr. Hardwich introduced the toning process.

Mr. DWYER:—It is scarcely fair to compare the silver printing of 1844 with silver printing of 1858, because the toning has been quite altered.

Mr. HUGHES:—I am sure every member present must be delighted with the different aspect under which Mr. Pouncey has

appeared to us this evening, and regret the unfortunate state of mind which he presented to us on the last occasion. I know Mr. Pouncey will not think I am personal in making these observations. *He* was not in a happy state of mind for explaining his process, and after a few remarks I doubt whether *we* were in a happy condition to receive his explanation; but he has met us here to-night in a very different spirit, and let us into the secret of his process. I think we ought to look leniently at his endeavours, seeing that his process in so comparatively short a time stands high, and its main merit is that in which our process is the weakest. If, during a few weeks, such a change as we now see can be produced in his prints, we may reasonably hope that it may be advanced still further. But even supposing it could not go further, there doubtless could be found a use for it, and it would fall at once into its proper place. I, for one, cannot see why we should not have several different *printing* processes as we have different other processes. We have the ordinary calotype which is beautiful when portraying rusticity, and we have the ordinary wet collodion and dry collodion processes *ad nauseam*; but hitherto we have had but one printing process, which is marvellous in its first existence—giving us first the red hue which we have got rid of, but with it we have got rid of a good many of our pictures too, for I think the fading of so great a number is solely due to the villainous old hypo-baths. In the daguerreotype we had a very perfect process projected and carried out by Daguerre, but that process just wanted one finishing stroke to arrive at its present excellence, and after arriving at which it never moved beyond. It required the film of gold to be precipitated over it, and those pictures are the most permament which the art has yet shown. This brings me to notice that Mr. Hardwich almost supplies in his process something like Fizeau supplied to the Daguerreotype. We all expected that it was gold upon which we had to depend for permanency, but it was so mixed up with hypo that until it was separated from it we could have no dependence. Now, Mr. Hardwich at our last meeting presented a very interesting process, and I dare say that many of us have since attempted to work it out with different degrees of success. We all like albumen prints, and until lately it has been almost impossible, except with some sulphuretting compounds to get a good colour. I do really think that I am not exaggerating when I say that photography has not stood in so high a position until we had this interesting exposition of Mr. Hardwich's. With respect to the observations of Mr. Malone, I do not think that the silver prints should be so perpetually compared with those in carbon. Let photo-lithography and all its subsidiary branches go on, but it is the plain direct printing on paper which is our object; and although we may import the sister arts into our own, it is quite beside the question. I think we had exhibited at our last meeting important steps towards permanency. If Mr. Pouncey will not push us to pronounce an absolute opinion upon silver *versus* carbon, we shall be in a condition to thank him for his contribution towards photographic improvements, and I have no doubt now that he will find practical photographers will assist him in getting rid of any existing defects.

There is a point alluded to by Mr. Shadbolt, that the negative should be suited to the mode of printing; now it is quite possible that the same kind of negative will not do for different processes, and I can easily imagine a condition in which carbon would give a better print from the negative than the silver. In the daguerreotype we have the positive direct, while in the other photographs we have but two halves; and if they do not fit, we have an imperfect positive. We may have a set of negatives that will print on plain, but not on albuminised paper, and *vice versa*, and it is but reasonable to suppose that in a new method of printing altogether, the negatives should have a character of their own also. I will hint that I see no reason why we should not have ink processes with the same degree of developement as Mr. Pouncey's.

Mr. Wood:—The question resolves itself into two points—the appearance and the permanency. With Mr. Pouncey's permission (when I came into the room) I pointed out all that were silver and all that were carbon; there is, therefore, a difference of half-tone which I think depends entirely on the amount of exposure, no matter what the process may be. The difficulty, as it appears to me, lies not in taking the half-tone but in getting that smoothness by which you pass from one tone to another. In Mr. Pouncey's there seems to be a certain roughness, as though the prints were produced by a sort of combination of little spots. Permanency is a chemical question, and can only be solved by chemical inquiries. It appears to me that all silver prints have something in them by which they will inherently fade,—my theory is, that in all our processes the action of light is not on the metallic compounds but on the organic matter with which those compounds are in contact. The distinction between inorganic and organic is not sufficiently defined; but you will find that, in all cases, the action of light is upon the organic and not upon the inorganic matter. In all silver prints then, in whatever way produced, negatives or positives, I regard the picture to be a compound of organic matter and silver; and so long as these are united there will always be the great danger of light and damp, and other atmospheric influences, combining together to oxidise the organic matter in contact with the silver, and throw it down in a metallic form, until at last we have nothing but the metallic silver in the paper, forming so slight a layer that all the picture is obliterated. This being the case, I think that the substitution of carbon for silver is a very great step in advance. It may be said that in carbon we have an organic substance; but there is no substance in nature so permanent. The sesqui-oxide of chromium, which we must take to remain in the paper, has been subject to severe tests by the Photographic Society of Paris; therefore I think it is our duty to encourage the carbon process.

The cause of failing in silver prints appears to me to lie in the fact that more or less of an acid solution of sulphate of soda has been used instead of the alkaline solution, and, in the second place, in the atmospheric condition. I cannot agree that the daguerreotype is more permanent, because it has not yet been subject to the same severe tests that other photographs have.

Mr. Malone:—Say that we cannot tell what the composition is—that it contains silver, we know—but it contains organic matter, we know—whether they are united as a compound of silver *we do not know*, consequently all our theory as to the fading of the silver may be wrong. I say that the print whatever it may be, whether coloured organic matter, or silver, or the two combined, I say that it resists oxidising agents, which would destroy many other matters whether organic or metallic. But as the silver process is somewhat on its trial to-night, do not let us admit *supposition*—I cannot for one—and if you ask me and press me saying, "do not you see the silver fading about you right and left in every direction?" I say I see all that; and further, that having got before us a good practical process that we can all use, we must discover the true cause of the failure, and not say we must give it up until we get carbon printing to equal it. I have gone further, and said on a former occasion that I believe a silver print will fade unless it is carefully preserved. Then I explain that and say, that photography is full of paradoxical circumstances. A photograph fixed in fresh hyposulphite of soda in 1844, washed only in three waters (and the third water must contain a portion of hyposulphite), has not faded. Then you see what an important principle is contained in that fact. Now I should further say, if that picture had been washed with ten washings would it have faded? Will you, then, not have confidence in pictures that have had ten washings?—and moreover, that having watched such a picture, it is evident that it may be kept in an ordinary portfolio; but we must be careful in what atmosphere we put them, for hydrosulphate of ammonia would change its colour, and make it darker, and thus improve it; but if the action of hydrosulphate of ammonia be continued the picture will fade.

In large towns hydrosulphate of ammonia exists in rooms, and pictures there fade away by sulphuration in bad atmospheres. They are not so good in that respect as carbons, but then am I to give up silver printing because I live in a badly drained house? They do not of necessity fade as far as our experience goes; but should they do so, after all I have said, my position will still be a good one.

Mr. Hughes:—As regards permanency, the early daguerreotypes fixed by gold, still exist in large proportion, compared with the number that was produced, and the daguerreotype, I repeat emphatically, does not fade. There are many old daguerreotypists in this room whose greatest yearnings are for the durability of the daguerreotype; they did not sulphurate, and blueish film was sometimes formed near the edge, but this was effectually removed by the application of cyanide of potassium, and I imagine sulphurisation would be remedied in a photograph by coating it with gold. Did any one ever try cyanide of potassium upon a paper proof?

A Voice:—Yes.

Mr. Hughes:—And what of the print?

A Voice:—Out.

This last monosyllable brought Mr. Hughes to his seat with the suddenness of an electrical shock, amidst much merriment, upon which the Chairman seized the moment of hilarity to remind the meeting that the discussion had been prolonged far beyond the appointed time, and that each side of the question had been fully represented in their meetings.

The CHAIRMAN then stated as follows: I think it is the feeling of the Society that it is very desirable that Mr. Pouncey should go on with his process, and that all who have the time and means should labour to assist him, but that they will still continue to prefer the silver process, which is most beautiful, even remembering the poet's words, that "all that's bright must fade." I remember in photographing a manuscript of Alexandrinus, I noticed that all the material with which the writing had been formed, which I may now say was carbon (and which was the general material of manuscripts) had so corroded the vellum, that the letters were only represented by the actual cutting out of the vellum surface, so that even the most imperishable materials have, after all, only a limited duration. I am sorry to say that even carbon prints are not everlasting. The precaution taken at the British Museum to ensure the safety of prints is increasing; they are constantly obliged to be brought out to the air and dried, and watched with as much care as little children.

I must now convey to Mr. Pouncey the thanks of the Society for the paper which he has read, and wish him every success.

We have also the promise of a paper from Mr. Pretsch, on a kindred subject.

I have now to remind the Society that it is the evening for them to appoint auditors to audit the accounts of the Society for the past year. I must therefore call upon the meeting to appoint two gentlemen to perform that duty, according to the regulations of the Society.

Messrs. Heath and Harrison were then duly elected auditors, and several candidates were ballotted for and duly elected members of the Society.

Several specimens of carbon prints by Mr. Pouncey, with silver prints from the same negative, were exhibited, and though the carbon prints were really admirable, they were clearly not equal to their silver duplicates, and this fact was very apparent, in a couple produced from the negative of a snow scene, in which the exaggerated contrast of light and shadow was most unpleasantly prominent in the carbon print. In a picture of the *Feathers Inn*, at Ludlow, the carbon seemed to answer very well.

There were also exhibited two albums, containing photographic delineations of geological strata, by Mr. Gutch, beautifully executed; specimens of Mr. Hardwich's toning process, very beautiful in effect; two lithographic stones, engraved by light (a positive and a negative), by Mr. Pouncey; and a telescope, by Herr Pretsch, having one of Petzval's new photographic lenses mounted as its object glass.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

AT the ordinary monthly meeting held at Myddleton Hall, Islington, on the 29th Dec. 1858, G. SHADBOLT, Esq., Vice-President, in the chair. After the usual routine business, Mr. Shave exhibited some photolithographs which he had produced in consequence of the remarks made on this subject at the last meeting. He had had no previous experience, and found the operation very simple. He worked upon the principle patented by Cutting and Bradford of Boston, U.S.*

Mr. HANNAFORD objected to the *principle* of the process tried by Mr. Shave, as not admitting any "touching" of the stone, and thought it would be easier to remove grease than gum from the stone, hence he would work in another direction. He objected equally to the principle patented by M. Poitevin, as in that case the ink was adherent not to the stone itself but to the hardened organic matter on its surface. He proposed beginning by greasing the stone, coating this with the sensitive surface, removing the grease where not required, and then the protecting gelatine or other organic matter acted on by light, thus leaving the greasy parts, previously protected by the hardened coating, to receive the ink from the roller.

Mr. HISLOP then read a paper by Dr. HILL NORRIS, "*On the Dry Processes*," [see page 15] on which a discussion ensued, in which Messrs. Hill, Shave, Hislop, Hannaford, Rev. John Winter, and the Vice-President took part, and was principally directed towards the greater or less amount of washing which dry collodion plates would bear or require.

It was also noticed by the last-mentioned gentleman, that Mr. Maxwell Lyte had, some years back, suggested the probability of there being two or more compounds of the iodide with the nitrate of silver, as now remarked by Dr. Norris. It was further remarked, that Dr. Norris was the first to announce the *principle* upon which success with dry collodion is dependent.

* As first essays the specimens were very good, even a portrait (a difficult test), being infinitely superior to most of the woodcuts.—ED.

Mr. HANNAFORD next read a paper "*On a New Iron Printing Process*," [see page 24] and exhibited numerous specimens produced by it, and hoped by the next meeting to be in a position to exhibifurther and even more favourable results.

Mr. LEGG presented some beautiful photographs of microscopic objects, and promised to explain (and if possible demonstrate) his mode of operating at the next meeting.

Mr. HISLOP also promised to read a paper "*On the History of the Dry Processes*" at a future meeting. Votes of thanks were passed to Dr. Hill Norris and Mr. Hislop, Mr. Hannaford and Mr. Legg, and after further discussion on the subjects brought forward, the meeting was adjourned until the 28th instant.

It was determined at a committee meeting, previously to the ordinary sitting, that as some misapprehension had been found to exist in consequence of a *professional photographer* having an establishment upon the same premises as those in which the meetings of the Association are held, an advertisement should be inserted in the local papers, to intimate that the North London Photographic Association is *not in any way* a trading concern, and totally unconnected with the practice of photography for gain.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of the above Society was held at the Literary and Philosophical Society's Rooms, on Wednesday, the 5th instant, Mr. SIDEBOTHAM in the chair.

A new member was elected.

Mr. OXLEY exhibited a gasholder for the supply of oxygen for the lantern.

The PRESIDENT called the attention of the meeting to a number of carbon prints by Mr. Pouncey's method, taken by Mr. Mudd, which were handed round for inspection. He said he considered the specimens shown quite equal to what Mr. Pouncey had produced; he thought that gentleman's specimens very poor, and if he could not produce better prints, the process was very unsatisfactory.

Mr. WARDLEY said he thought the more delicate details of the sun-prints could not be obtained by Mr. Pouncey's plan, and he considered it very far short of what was required.

Mr. MABLEY said he had tried Mr. Pouncey's plan for some time past, but had now resolved to relinquish it.

A long conversation took place as to toning with sel d'or and alkaline baths; also as to Mr. Maxwell Lyte's plan of sulphate of soda.

The PRESIDENT called attention to the subject of developing by daylight, after dissolving the iodide of silver, and remarked that it was a curious fact, that it was only a collodio-albumen plate which could be developed after the fixing, and that several members who had tried had been unable to develop plain collodion; also that after fixing with cyanide it seemed impossible to develop any.

Mr. H. YOUNG stated that he had been able to develop after fixing with cyanide, but thought it required much longer time and showed a picture so produced.

A long discussion followed as to the theory; and

The PRESIDENT said he had examined the film of an exposed plate after fixing, under a powerful microscope, but could not see any trace of the picture; and that Mr. Nield, a member who was absent that night, had been trying a new process, called the "*Treacle Posset*" process, and had obtained some very good results. The plan was, to obtain serum of milk, by breaking milk with treacle and acetic acid. This idea had occurred to him from a suspicion that Dr. Hill Norris's plates were prepared by serum of milk. It had occurred to him, that the council might get up a stereoscopic magazine, from photographs taken by the society, for distribution among the members, and the idea seemed to be approved of by the meeting.

A further discussion on the subject of printing took place.

Mr. MABLEY said he (the other day) looked at some prints taken by him a long time since by gelatine and chloride of silver, and developed, and they seemed as good as ever. After discussing the method of washing prints, it was considered that a short washing of an hour or two was better than a long one.

A vote of thanks was passed to the President and the proceedings closed.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held in the Odd Fellow's Hall, on Tuesday evening, the 28th ult. WILLIAM HOWELL, Esq., one of the Vice-Presidents, occupied the chair.

A new member was admitted in the person of Akers Edwards, Esq.

The Hon. Secretary, Mr. Haines, read an interesting paper "*On the Uses and Abuses of Photography.*" The first branch of the subject was cleverly treated—the use of the art as a means of taking portraits and views, decorating the walls of a dining or drawing-room, serving the interests of science, aiding in the detection of criminals, &c., being pointed out in detail. As to the "abuses" of the art, he said:—Let us suppose a person fired with enthusiasm for the art; he takes up a newspaper, where he sees advertised, "A set of apparatus, with chemicals complete, for 30s." He rushes to the shop of the advertiser, purchases his apparatus, never stops to think if he knows any thing about the process, but stumbles over every part of it, until he gives it up in despair, and abuses the art to all his friends, just because he has been unsuccessful. It may be, that having purchased a shilling pamphlet, "Photography made easy," he at length masters its contents, and can take an image fairly in the camera. He at once considers himself an artist, but it is not so: a man may be a photographer indeed, and may be able to take likenesses, but it requires much more than this to become that great essential to the true practice of photography—an artist. If such a person is taking a portrait, he cares not for the posture of the sitter, which way the light falls, or the colour or description of the background; or if he has progressed so far as to have a background painted in imitation of a landscape, he thinks nothing can be better. But as you all know, the beauty of a portrait is not only in the background, or in the distinctness of the figure, but it consists in having that depth of shadow and roundness of the features so seldom discerned in the generality of the portraits taken in the present day, and which can only be obtained by a proper management of the light. Thus, then, I consider that a want of a proper knowledge of the art, a want of intimacy with the necessary chemicals to be used, and a want of the true artistic spirit necessary to make the good photographer, are some of the chief abuses to which photography is exposed.

Another great abuse is the frightful exhibitions now to be seen in almost every street in most towns in England, to which notice is requested by a voice, which announces that there you can have "a correct likeness and frame complete for sixpence!" Indeed, I heard the other day of one spirited individual, who seems determined to cut all the others out, and who has reduced his price to the "low charge of twopence." The pictures shown in these exhibitions are really "frightful," and it is frightful to see how low one of the noblest arts can be brought by a parcel of unscientific men, who have perhaps left their shopboard or their bakehouse, to become what they are pleased to designate themselves on their address cards—"photographic artists." Many of these, not content with simply perpetrating such vile things as their portraits usually are, make ugliness still uglier, by daubing them with paint, for which they will inform you they charge "sixpence extra."

Another abuse of photography consists in the indecent and disgusting pictures which are exhibited in many of the windows in London and elsewhere. You must lend your aid in causing the discontinuance of those abuses, which are so fatal to the well-being of the art. The formation of such Societies as this I consider the first step towards the safety and progress of photography. The exhibition last year was, I think, very likely to benefit the art here and elsewhere, as until then most people thought that photography was only intended for portraits. By a regular attendance at the meetings, by reading papers on practical subjects, by contributing pictures to the album of the Society, and in other ways, we may do much to promote the interests of our art.

[These last points were enforced at some length.]

Mr. Akers Edwards said, that in the paper just read, one "abuse" had not been mentioned: he referred to the mode in which photographic pictures were often pirated. He knew a gentleman who had spent £1200 in acquiring a knowledge of the art, making experiments and taking pictures; and having lent some of his negatives to a certain Society, he now found that reduced copies of them were on sale in London. As to the indecent stereoscopic slides of which Mr. Haines had spoken, he was informed, a few days since, that a number of gentlemen had formed themselves into a society for suppressing them.

Mr. Osborn (Treasurer) — The views taken by Frith in Egypt were pirated, but they were not so clear as the originals.

Mr. Edwards — It is impossible, when copying them the same size, to get rid of a little granulation. Of course, by entering photographs at Stationers' Hall they are protected from piracy.

Mr. Osborn — It is sometimes difficult to tell your own negatives, in transparent pictures especially. I saw a set of pictures offered for sale some time since, not one of which was printed from the original negative. Rejlander's *Home sweet Home* is mentioned in the paper, and I may state that this picture is singular as being an application of photography to artistic purposes. The picture was made from eight distinct negatives, taken in different parts of the country, so that it is entirely a composition. It is so beautifully worked together, that you cannot distinguish the separate parts. Clouds, water, and foliage, were taken at different times. As to the employment of photography for astronomical purposes, I may mention that it is in constant use at Greenwich, for registering the variations of light from the sun, and for other purposes. Mr. Haines alludes to photography having almost reached its crisis.

Mr. Haines — No: I meant to say, that if we do not take care it will go down.

Mr. Osborn — Well, one result of its going so low will be, that it will drive out all except those who are really artists. I hope that now the price has gone down to twopence it will go to one penny.

After a few further remarks, a vote of thanks was passed to Mr. Haines on the motion of Mr. Osborn, seconded by Mr. Brown.

Mr. Osborn having announced, that at the next meeting a paper would be read by Mr. Morris, the proceeedings closed.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The ordinary monthly meeting of this Society was held in George Street Hall, Edinburgh, on the evening of Tuesday, the 11th instant. The attendance was limited. Mr. Johnston occupied the chair.

Discoveries in Photography.

Mr. Taylor, South Bridge, read an interesting paper on this subject. After a few prefatory remarks as to the fertility of the question, and the rapidity with which new and startling discoveries were brought to light, Mr. Taylor said, that in his opinion three men only were entitled to place in the foremost rank of early photographic fathers, viz — Daguerre, Nicephore Nièpce, and Fox Talbot. Through the discoveries of these eminent men the art of photography had attained its present high status. While he could not recognise in the experiments of Wedgwood and Sir H. Davy any peculiar grounds for the great merit usually attached to them, it was quite different with Scheele, who, in his experiments, subjecting the silver salts to the action of the prismatic spectrum, first struck out a path different from that previously trodden by the old alchemists, who seemed to rest satisfied with a knowledge of the fact, that certain salts became rapidly nigrescent on exposure to light.

Although the discovery was attributed to Ritter, he thought it seemed scarcely probable that such a close observer as Scheele could have failed to see the now well-known actinic action of the highly refrangible dark rays, beyond the violet, in the spectrum. If he did observe this peculiar property, he made no mention of it in his researches, which were published in the year 1777. Ritter made this interesting discovery in the beginning of the present century.

The first to enter the field of active photographic discovery, was N. Nièpce, the main feature of whose discovery was, that certain gums were so changed in their constitution by an exposure to light as to become quite insoluble in menstrua, in which they readily dissolved previous to such exposure. N. Nièpce was the father of all such as employ bitumen or analagous substances in photolithography, photographic engraving, and direct positives on white metal plates. The large photograph by Mr. Macpherson, in the Society's Album, was an illustration of his process.

Daguerre's beautiful process quite took the scientific world by surprise the extreme minuteness, fidelity, and beauty of his pictures, exciting unbounded admiration; nor was this to be wondered at, for even in the present day, when the eye was accustomed to all that was beautiful in art, a well executed photograph never failed to excite sentiments of a pleasing kind. Pity it was (continued Mr. Taylor) that the process of Daguerre met with so few adherents, but perhaps this was attributable to the labour of polishing the plates. Veteran photographers still looked back on this, "their first love," with feelings of fondness.

Of the importance of the discoveries of Fox Talbot, they were all aware. To him photography owed the Talbotype or calotype process,

the waxed paper process, the albumen process, the general process of printing positives from negatives, the process of printing positives by developement, and lastly, the art of photoglyphic engraving. The ball of photographic discovery having been thus started, had kept rolling on until photography had reached its present gigantic stature.

Mr. Taylor then referred to the many sub-discoverers in the art, whose names would, he said, be imperishable in the annals of photography. Having apologised for the omission—an unintentional one—of many names well deserving of notice, he said we were indebted to Archer for the collodion process,—a successful method of removing the collodion film from glass, and the process for producing the white positives on glass, now called the "Alabastrine Process;" to Becquerel for scientific investigation in polychrome photographs, in the exciting and counteracting action of certain rays, &c.; to Beauregard for the process, now called the "Ink Process" of printing positive photographs, and for the successful production of polychrome prints. To Sir David Brewster we owe the refracting stereoscope; to Berry, leather as a substance on which to take collodion processes. To Burnett we owe a lot of investigations on the photographic properties of the salts of iron, copper, chromium, uranium, and others; for band and coloured lenses; for a discovery by which the strength of paper is very much increased, by being converted into a species of parchment; for the discovery of leather varnish, on the surface of paper, and the action of tannin and gelatine; for toning positives by neutral and alkaline chloride of gold baths, rendering over-printing unnecessary; for the successful application of ammonia as a substitute for hypo-sulphate of soda in paper processes; for the suggestion of burning-in uranium and other photographs, in presence of an atmosphere of hydrogen or other reducing agent, in order to obtain dark colours. To Church we owe the pneumatic plate holder; to Claudet the discovery or application of chloride of iodine in daguerreotyping, an instantaneous printing process in which chloride of mercury is employed, and the invention of the whole lens stereoscope. To Crookes we owe varied scientific investigation of a highly interesting character in polarised light and the prismatic spectrum, and, with Mr. Spiller, the first successful application of an attempt to preserve the sensitiveness of collodion plates. Edwards first transferred the daguerreotype to paper; Fyfe was the first to produce positive pictures on paper by one operation. To Fizeau we owe the discovery of hypo-sulphate of gold as a fixing agent for daguerreotypes. Fothergill discovered a dry collodion process, in which the albuminate of silver is employed. Gaine invented a process for the conversion of paper into a species of parchment. Gaudin gave us cyanide of potass as a substitute for hypo-sulphate of soda in fixing glass positives. Goddard first applied bromine to increase the sensitiveness of daguerreotype plates. The numerous and important researches and discoveries of Herschel and Hunt would require to form the subject of a separate paper. Johnston was the first to impress photography into the service of wood engraving. Laborde discovered the addition of salts of lead to allow gallic acid to be used in developing collodion pictures. Lafond discovered the application of photography to ceramic decoration. Le Gray invented the waxed paper process. Lyte discovered an instantaneous collodion process, with prolonged time of keeping before exposure; also for the application of meta gelatine as a preservative agent. Llewelyn gave us the oxymel process—a slight modification of Shadbolt's honey process. Malone made philosophical researches in photography. Moser's name was associated with the introduction of thermography, although he (Mr. Taylor) believed it owed its discovery to one of his own profession, a watchmaker in France. Nièpce de St. Victor perfected the process of his uncle, N. Nièpce, and made many experiments in photography, especially in the higher branches of it. We owe to him the albumen process on glass, and the discovery of some very wonderful properties in iodine. He (Mr. Taylor) believed he had also succeeded in producing polychrome pictures. Noton invented a beautiful adjustable stop for the front of the lens. Norris gave us the now deservedly popular dry collodion process. Petzval was the author of the double combination of lenses for portraits, and also of the orthoscopic lens for landscapes; Ponting gave us bichromate of potass; Pouncey, carbon printing; Pretsch, photogalvanography; and Poitevin, a highly successful system of photolithography. Salmon and Garnier discovered a system of photographic engraving, based on the affinity of mercury for those parts of an iodized brass plate which had not been exposed to light. Shadbolt was the father of micro-photography, and of all those who used saccharine preparations for the preservation of collodionised surfaces. Stokes made the discovery of fluorescence, or the rendering visible the refrangible dark rays in the spectrum. Sutton gave us a highly satisfactory and popular mode of producing prints by developement. To Taupenot they owed the collodio-albumen process; to Wheatstone, the reflecting stereoscope; and to Woods, the catolysotype and other beautiful processes little known at present.

When on the subject of modifications and re-discoveries, he instanced Mr. Shadbolt's honey process as the one which, more than all others, had been subjected to undergo most modifications; none of which seemed to be any improvement on the original, and many of them much inferior. One discovered that sugar and water was a substitute for honey, and he aspired to immortality as the discoverer of the sugar and water process. So with the sweet wort process, the raspberry vinegar process, the glycerine process, the sour ale process, and other "processes" *ad nauseam*, until matters were fairly brought to a climax, by a side-splitting communication from Manchester, which satirically detailed the history and virtues of the discovery of the great "gin and water process."

He stated that the uranium discoveries of Mr. Burnett had been the subject of a *re*-discovery of Nièpce's; with this important difference also, that Burnett's was very much superior to Niepce's. The most glaring case seemed to be that of the discovery of the ink process of Beauregard, which was re-discovered and patented in this country a year after it had been published in the *Journal of the Photographic Society*, re-discovered and published as new a year after it was patented, and again re-discovered and published *as new* a few months ago!

A brief discussion ensued on the subject of Mr. Taylor's paper, in which Mr. Tunny claimed the first application of collodion for Le Gray.

In reply, Mr. Taylor stated that while granting that Le Gray was the first to employ collodion, he claimed for Archer the process as practised in the present day.

A vote of thanks having been awarded to Mr. Taylor for his paper, the meeting adjourned.

Exhibitions.

NOTES ON THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

SECOND NOTICE.

[From a Correspondent.]

In my last, addressed to you from Scotland, I gave you a brief notice of the principal or leading pictures, but scarcely touching those of Scottish artists, save one or two — to which I will now return, if you find my remarks sufficiently interesting to your readers.

I closed my last letter by an allusion to Maxwell Lyte's six pictures, Nos. 965 to 970. Four are by the wet collodion process, two by metagelatine. They are about equal in minuteness of detail, fine perspective, and richness of foliage, with the mountains towering aloft in the distance, "lending enchantment to the view." The skies are evidently from separate negatives, but skilfully printed, greatly enhancing the beauty of the scene. They are softer and sharper than those of Mr. Raven's of the same scenery; but not apposite to compare, the one being by waxed paper, the other by collodion. No. 969, "Le Sac Bleu de Bagneres," is exquisite, very similar in tone to Rejlander's "Loch Katrine," both in the still water and lichened rock on the spur of the hill. They are toned with phosphate of gold.

Mr. H. Ross (who is, I believe, Vice-President of the Photographic Society of Scotland) exhibits a gigantic quota, no less than *fifty* different subjects. Some are by the wax-paper process, and some by collodion. Nos. 481 to 484, "The Happy Days when we were Young," are studies of frolicsome juvenility, such as shooting and fishing during schoolboy vacations, calling up reminiscenses of days long gone by, never to return to those engaged with the sober realities of life, but on the page of memory.

There are among this gentleman's contributions (who follows in the wake of Landseer) several sporting pieces, with deer, that would make fascinating studies were the composition in keeping with the subject. No. 390, for instance, has a mere blank paper sky, but would make a good picture if the details and other accessories in the foreground and distance were suitable. I think Mr. Ross might make charming groups if he would try printing from various negatives like Rejlander or Robinson, not altogether the barren waste or bleak mountain side, but from some warm corrie or glen, with gorse, stunted shrubs, and trees for a foreground, and for distance the undulating mountain scenery abounding in the Highlands of Scotland, or following the language of the poet—

"The rugged mountain's scanty cloak,
With dwarfish shrubs of birch and oak,
With shingles bare, and cliffs between,
And patches bright of broken green."

From the large number of pictures sent by this amateur I would infer that he is enthusiastic, and not to be deterred by trifles from accomplishing what he has set his mind to do — once surmounting his present bias, he

will send no more Royal Stags, with a skyless, distanceless, background. No. 789—"Infantry in Column," is a good picture, though a little out of focus at the margin: the men have been very steady, as is the wont of the British when called to duty. The waxed paper in the hands of this artist is not quite up to the mark, though he exhibits a great variety by that process. I was informed that he had heretofore worked only with collodion, and think he would do well to adhere to his *first love*.

Lyndon Smith's views on the "Rye," (Nos. 443 to 446,) and "Woodlands on the banks of the Rye," are fine studies, with good clear distance.—No. 737 is dense, thick, feathery foliage, yet has fine ærial effect, the light playing through among the stems on a sloping bank.

Mr. Lamb, of Aberdeen, contributes ten pictures. No. 743, "Castle Street, Aberdeen," is excellent, sharp and clear. He has also several good landscapes.

William Walker's (Nos. 97, 381, 531) "Dalhousie Castle," and views on the "Esk," by the calotype *(old school)* process, are very good; Nos. 531 and 535 are pictures of the same spot—the waxed paper one by Mr. Kinnear is much larger, but it is not so well printed, or is from an inferior negative.

No. 582, by C. Silvy, "River Scene in France," exhibited by Murray and Heath, London, is a singular picture, with a dark thunder cloud ready to burst, black as midnight, yet clear and transparent in the shadows. Is this a true portrait of that country? Is it a method of speaking out, yet escaping the fate of a political martyr? To these questions I cannot reply, as I do not profess to be able to solve such enigmas; but as a picture it has my approbation.

"Laymouth Castle" (Nos. 65 and 66), by Mr. Craigie, is a noble pile of building, but the outlines are too sharp and hard. I hope he will do something better on a future occasion.

Mr. Pouncey has found his way across the Tweed, notwithstanding the scene in London on a late occasion: he is represented by one solitary specimen, No. 578. I assure you if the advertised specimens at a guinea are like this, I shall button my pocket, and reserve my guinea for something better. It is harsh and hard, without gradation of tone, and few would regret its "*fading away*." The carbon process will not become universal, even though it does promise permanence, until, in competent hands, it educes something very superior to that now exhibited in Edinburgh.

F. Bedford shows some exquisite pictures of buildings by the collodion process, principally ruins, with ivy clambering over them; they are all purchased by the Society, and I believe are got up for the Architectural Association. Fenton exhibits several large landscapes of Scottish and Welsh scenery, well-known to most photographers throughout Britain. B. B. Turner, and J. H. Morgan, Bristol, excel in woodland scenes; it would be difficult indeed to over-praise them, they are so faithfully translated—so perfectly true to nature.

There are also several lady photographers, who work by the collodion process, and are not afraid to be seen with silver stains upon their fingers. Miss Ann Taylor (professional) exhibits twenty pictures. Nos. 581 and 696 are comparable with the great majority of proofs in the saloon: "Entrance to the Falls of Moness," with a fine rustic bridge, is as choice a landscape as one could desire, and a brilliant impression.

Even in the cold, frigid north of Scotland, this fascinating science has its devotees. Sutherlandshire sends its views of the Helmsdale by Mr. Houstoun. Every village and hamlet through the length and breadth of Scotland seems to be inoculated with a desire to promote the fine arts, by exercising their talent in producing pictures through the mysterious actinic power of light, so lately developed out of the darkness of bygone centuries.

Before leaving the landscapes, we must notice some to which our attention was drawn, *not in the Exhibition*, but in Messrs. Ross and Thomson's case, at the bottom of the stairs leading to their rooms. They are very large botanical studies, perhaps about 16 by 16, fitted to form splendid foregrounds for artists: they are described by Sir David Brewster in the *North British Review*, a quotation from which I have copied out, and is as follows:—"Messrs. Ross and Thomson published some time ago the most beautiful photographs of plants for foregrounds, taken while growing at the foot of rocks and trees. Of these, the ferns, the dock leaves, the foxgloves, and the nettle, are beyond all praise; but charming as these are, they are surpassed by two on a larger scale, which have recently appeared under the name of 'The Quiet Corner,' and 'The Dike Side.' These photographs, 15 by 15½ inches, full of the poetry of vegetable life, teem with wild plants of the most picturesque lovely forms, and are rich in the variety and luxuriance of leaf and stem. Though devoid of fragrance and of colour, they allure us to the cooling fountain which waters them: they tempt us to nestle in the little rocky hollow which they adorn, and to weep with human sympathies amid creations that are fated but to bloom and die." In the Exhibition there are none of this class that will for a moment compare with them, and I send you the quotation from the pen of the President, as preferable to anything I could give you.

In the Exhibition there are shoals of portraits, but these have little interest out of the locality. Some are touched, some are painted, some are enlarged to the size of life; many have eyes put in, while others have no eyes at all. I examined minutely a considerable number of these, and would place first and highest on the roll those exhibited by Mr. Rodger, of St. Andrew's: they have a delicacy and beauty of finish, are soft, chaste and posèd in a dignified attitude. No. 667 is a "Portrait of a Lady," to which I refer as a specimen.—Messrs. G. and D. Hay send a large number of excellent portraits. No. 266 is a good example of their work, and I am persuaded they are purer photographs than those of any other large contributors to the Exhibition. Their positives on glass are well known, and highly appreciated in Auld Reekie.

Maull and Polyblank send thirty-five specimens of portraits, not one being marked as touched, while I am persuaded every one is tampered with more or less. I am acquainted with a gentleman who unmounted a copy of Macaulay's portrait, issued by that firm, and found it to be almost entirely painted over with sepia, which being removed by the washing, left the historian's countenance somewhat unsightly. They are very creditable specimens of *art*, when touched up and hot-pressed, but miserable photographs. The great bulk of the portraits exhibited are in this condition. Mr. Moffat's, I believe, are less so than either Claudet's or Maull and Polyblank's, but they are certainly touched.

Mr. M'Leay exhibits a touched and an untouched photograph, side by side: this is as it should be, and renders the competition fair and honest. Mr. Tunny's portraits are less touched than some others, but some of them want life and light in the countenance; they look in a brown study, with downcast eyes, as if meditating on the pains of impecuniosity or other dismal state. Mr. Valentine, of Dundee, sends some about half-life size: I always find the smaller portraits most faithful. It is impossible to go over the whole. There are specimens from Messrs. Nelson and Lamb, of Aberdeen, Mr. Dounnie, of St. Andrew's, and various others. I was glad to have an opportunity of seeing them. I was greatly pleased with the Scotch Exhibition as a whole, and will do myself the pleasure of endeavouring to conjoin business with amusement, and pay it another visit on some future occasion. SEL D'OR.

NOTTINGHAM PHOTOGRAPHIC SOCIETY.

AWARD OF PRIZES.

To the Council of the Nottingham Photographic Society.

2, *Upper Hornsey Rise, N., Middlesex.*
4th, January, 1858.

GENTLEMEN,

Having been appointed by you to report upon the respective merits of the various contributions from your members competing for the prizes offered by your Society, with a view to the encouragement of excellence in the practice of photography, I have to make the following observations, viz.—

I have carefully inspected each and all of the specimens submitted to me, and find a considerable degree of merit in many, not to say most of them. There are,

Of pictures 10 in. × 8 and upwards in dimensions, *eight* class A.
Of those 8½ in. × 6½ and under " " *five* " B.
Of double stereographic pictures ... ... *fifty-seven* " C.

I am instructed by you, that

"The various qualities, including artistic composition, which characterize excellency in photography—without reference to the process—are to form the basis for the adjudication of the prizes."

The above regulations, though readily enough applicable to classes B and C, present a difficulty with class A, in consequence of each of the two pictures competing being deficient in only one point.

The selection lies between "West Door, Southwell Minster, September, 1856," by the Rev. J. J. Dredge, and "Regent Street, Nottingham," by Mr. J. Bourne.

The negatives from which the former have been printed, were produced by the calotype process, and the lens employed for the purpose was evidently very far from perfect, a considerable amount of distortion in the marginal lines, especially at the upper part of the picture, being apparent, and the angles weak. It is however very artistic in treatment, the process employed well adapted to the subject, and the manipulation, both of the negative and positive proof therefrom, is probably as perfect as the means employed would admit of.

"Regent Street, Nottingham," by Mr. Bourne, is admirably executed in every particular, so far as regards manipulation. The negative, clearly on glass, appears to have been taken with a *very good lens*, applied with considerable skill, the near and distant objects being both properly defined and in correct proportion, the perpendicular lines at the margin of the picture free from distortion, and finally, the printing of the positive impression performed in a highly satisfactory manner. It is, however, very questionable whether the application of so much skill to the delineation of a *mere street view*, possessing very little of architectural interest, and totally destitute of every vestige of life, is not labour thrown away. It is true, that in the treatment of the subject every thing has been done which could have been accomplished, with the exception of the introduction of living objects; but with such a subject as that under consideration, this deficiency is a serious one.

I find, also, that the rest of this gentleman's pictures are nearly if not quite equal in manipulation to that mentioned, though all of them are somewhat deficient in the *artistic element*.

It is rather a point for the donors of the prize, than for me, to decide whether artistic excellence with as good manipulation as the means employed will admit of—or better manipulation by superior appliances, but somewhat wanting in the artistic quality—shall take precedence.

It may be contended, that the operator has the opportunity of selecting his tools; but on the other hand, so he has of selecting his subject, and what is of as much importance, his *point of view*.

I have however no objection to make to the latter in either of the two pictures in question.

I should prefer that the authorities of the Nottingham Photographic Society should decide as to which of these qualifications they are most desirous of encouraging; should they require an expression of opinion on my part, I shall not shrink from giving it, but I most decidedly object to assuming anything like arbitrary dictation in the matter.

In Class B there is no doubt upon the selection—the old castle, water, and bridge, sent in by Mr. T. F. Hurley, is far the best in this class in every point.

The stereoscopic subjects, Class C, are unusually good, and possess merit of a very high order as regards treatment, manipulation, and artistic excellence; indeed this latter quality is rather the rule than the exception amongst the fifty-seven specimens competing. I would mention particularly —

Southwell Cathedral, by E. S.

No. 7,—Bursley Park .... No. 9,—Llanrwst .... No. 24,—Wilford .... No. 27,—Wothorpe .... No. 29,—Wilford .... No. 31,—Peterborough Cathedral	By Mr. Woodward.
The Pagoda, Alton Towers .... Lady Mary's Terrace, Alton Towers ...... South Doorway, Shetley Chapel...... ..... Trunk of the Mejas Oak, Sherwood Forest	By the Rev. James J. Dredge.

Out of so many that are really excellent, it is a task of some little difficulty to select the one which can be regarded as absolutely the best. I have however no doubt at all that Mr. Woodward is fairly entitled to the preference, for though the specimens sent by Mr. Dredge are exceedingly good, they are not quite equal in manipulation to those of Mr. Woodward, which have equal artistic merit.

Mr. Dredge's negatives are apparently somewhat under-exposed or over-developed (possibly a little of both), owing, in all probability, to his being accustomed to the calotype process, which is peculiarly adapted to the treatment of subjects requiring rather a bold style.

Of Mr. Woodward's specimens, though all six that I have named are especially fine, the one that I select as most deserving is that numbered 29, Wilford, a landscape, consisting of a labourer's cottage with thatched roof, having a white gable end as the prominent feature in the picture: the shadows of the projecting parts of the thatch, of the old gate, and various protuberances, are beautifully transparent; the definition of the foliage in the background is very distinct, without the least snowiness of effect so frequently present; the cottage on the left in shadow, and the subdued tint of the foreground, are in "perfect keeping;" while the well-broken sky line, and delicate gradation of tone every where perceptible, unite to form a very charming composition.

I trust, that if I have not been able to perform my task with perfect satisfaction to every competitor, each one will perceive that I have endeavoured to do it with integrity to the best of my ability; and as I have given reasons for the conclusions arrived at, it is competent for others to judge of the soundness or otherwise of my views.

With best wishes for the success of your exhibition, I am, gentlemen, your very obedient servant,

GEORGE SHADBOLT.

In consequence of the above report the following letter was received by the writer:—

Dear Sir—I am directed by the Council of the Nottingham Photographic Society, to convey to you their warmest thanks for your examination of the competing works, and they will feel gratified by your publishing the report.

The Council will also feel obliged if *you* will name the picture which you consider most worthy of the prize, as they have left it *entirely to your decision.*—I remain, dear Sir, your's most respectfully,

FRED. R. FUSSELL.

Nottingham, 5th Jan. 1859.
George Shadbolt, Esq.

OUR REPLY.

Mr. Dredge's manipulation being as perfect as the circumstances *would permit*, it is to be presumed that had his lens been a better one, and his process one in which glass forms the support, his manipulation would have equalled Mr. Bourne's; while there is no evidence to lead us to expect that the latter possesses an equal talent for artistic selection; but *setting aside these considerations*, although very unwilling to pass over manipulative skill like Mr. Bourne's, I am constrained to admit, that inasmuch as artistic skill is of vital importance in the production of a pleasing result at all, and conjoined as it is in the case before us with great mechanical dexterity, I think Mr. Dredge is fairly entitled to take precedence. I wish it were in the power of the Council to award a second prize to Mr. Bourne, as I consider it would be well bestowed.

GEORGE SHADBOLT.

Processes.

IRON PRINTING PROCESS.

By Michael Hannaford.

Just at the present moment some little interest is felt in the discovery of new printing processes, to supersede *in permanency* the ordinary silver prints. In this, I doubt not, we shall succeed; but there for the present we must stop. Silver prints, in my opinion, will not for some time yet to come be equalled in beauty and delicacy by any other process now before the public.

In the iron printing process which I now purpose placing you in possession of, I do not at present claim equality with the silver prints in any one point, excepting that of permanency. It is (I am quite certain), however, capable of very great improvement, as I hope to be in a position to show at your next meeting.

To make the process as plain as possible, I will divide it under four heads—Sensitizing, Exposure, Fixing, and Toning and Developing.

Sensitizing—Float for about one minute on a solution prepared in the following manner—Fill two pint bottles, one with a saturated solution of bichromate of potassa, the other with from ten to twenty (say fifteen) grains of ammonio citrate of iron to the ounce of water. Mark one A and the other B. Then to A add a quarter of a pound of gum-arabic and half a dozen lumps of sugar. Two measures of A to one of B makes the solution of about the required strength. This however depends somewhat on the kind of paper used. If too much of the gum solution be added, the film will wash off in some parts in the after operations of fixing and toning, &c., whilst an insufficiency causes a want of vigour and depth of tone in the shadows. The most advisable plan for a beginner to adopt, is to commence with, say, equal parts of the solutions A and B—this will give a very weak picture—and add solution A by degrees, trying a picture between each addition until he has reached the maximum quantity of it that can be used with safety. A little care and experience at this part of the process will tend greatly to success. Ordinary albumenised paper answers best in my hands.

Exposure—A longer exposure is required than for a silver print. The picture should show of a dark brown ochre colour and give full definition and half tones. Only good negatives, full of definition and half tones, rather over-exposed than otherwise, should be used.

Fixing—Immerse in water to soak out the bichromate of potassa and ammonio citrate of iron not acted on by light. The exact time it remains there is not of much consequence. From half an hour to an hour will do. After taking the print out of water, I find that a very weak solution of ammonia (about one drachm to the pint) tends materially to keep the whites pure.

Toning and Developing—The ease with which almost any tint of the silver prints can be closely imitated in this process in the course of a few minutes entitles it I think to some degree of

favour. Pyrogallic acid, solution of tannin, or saturated solution of gallic acid (I generally use the latter) poured over the picture gives a warm sepia tint. A very dilute solution of chloride of gold, before the gallic acid, changes this to the gold purples of the silver prints. The gold can be superseded by the salts of manganese, copper, uranium, &c., by which the tint may be varied. Ferro-cyanide of potassium and gallic acid gives Prussian blue. The ferrid-cyanide, &c., produces blue black. But more on this part of the process at a future opportunity. I must ask your indulgence for this process as it stands at present for it is very far from being perfect. By your next meeting I hope to be able to give you full particulars on minor details, and more especially on the best kinds of paper to be used, and on the different toning processes.

Letters to a Young Photographer.

No. II.

My Dear Eusebius,

There is no such thing as "science for beginners." When you enter upon the study of a new subject, such as photography, you must expect to encounter many things which at first you cannot understand. You are like an infant who opens its eyes with dawning intelligence upon a world in which every thing is new; and the progress of understanding is slow, and, as I said in my last, is based upon experience. You wish to know the why and the wherefore of all you do in pursuing our art, which is a very laudable feeling, and one that I shall do my best to encourage and satisfy. You ask, why you are to mix water with the albumen? I answer—to dilute it, to reduce its strength, to make the paper less glossy; and you say you cannot get your paper glossy enough. Now the amount of gloss is a matter of taste. Some people cannot eat gingerbread unless it be gilt: they think they are eating pure gold while it is only copper. You may print pictures on plain paper, if you like it, but they will look dry, because for want of a little glaze there will be no transparency in the shadows, and unless these be transparent, they will have no depth, and consequently your picture will seem dry and flat. But the quantity of glaze necessary to secure this transparency is very small, and when you exceed it, you produce the effect of a varnish, which is desirable only in very few instances. The prevailing taste for high glaze leaves even pure albumen insufficient to the ends desired, and you will see, and may purchase, albumenized papers in which the glaze is produced by the addition of other matters than albumen, such as gum, gelatine, or dextrine. Even pure albumen, without the addition of water, yields too much glaze, unless the paper is to be used for stereographic pictures: in these the highest amount of glaze is admissible, as when viewed through the lens, the *grain* of the paper is magnified, and impairs the sharpness of the pictures.

Now as to the cause of the spots with which you say your paper becomes covered. Perhaps your albumen became soiled with dust while exposed in the dish, or perhaps the dish itself was dusty when you poured the albumen into it, or perhaps the floor of your room was not well swept before you commenced operations. Dust is a very subtle foe to the photographer, and constantly insinuates itself where it is not wanted, and where its presence is most objectionable. You must not venture to use any vessel until it has been carefully wiped out with a clean cloth kept for that purpose exclusively. You had however better strain your albumen, by pouring it through a funnel with a piece of clean sponge, wetted, placed loosely in its neck; this will effectually stop the passage of all mechanical impurities: and it is as well to keep funnel, sponge, bottle, &c. solely for this purpose; for if you employ them for any other, they may gather up substances that will cause "chemical reaction" when brought into contact with the salted albumen, and so mar your operations.

Paper has a right and a wrong side. The former is the smoothest, and has the highest glaze; the latter shows a *grain*, derived from the canvas upon which the pulp of the paper rests in the process of manufacture. You can easily distinguish the smooth side by holding up a sheet of the paper horizontally before a lighted window and looking along the surface; and it is this smooth surface that you will coat with albumen.

Why do I give the preference to chloride of ammonium over chloride of sodium or chloride of barium? I answer, because it is very important to the success of sensitizing papers that the chloride should be neither acid nor alkaline, but neutral. Chloride of barium I frequently find to be alkaline; common salt is generally impure. Moreover, as the most economical salt to employ is that which contains the greatest amount of chlorine in a given weight, if all the chlorides were sold at the same price the chloride of ammonium would be the cheapest. There is twice as much chlorine in an ounce of chloride of ammonium as there is in an ounce of chloride of barium. As to the colour produced in the positives by various chlorides, it is due not to the base, but to the acidity or alkalinity of the chloride, and the addition of a few drops of an acid or an alkali, will secure any desired result within certain limits. But you will find it better to use a neutral chloride, and that of ammonium has this advantage, it is rarely met with acid, and if it is, you can bring it to a state of alkalinity by the mere addition of a few drops of ammonia solution, and any excess of ammonia will evaporate as the paper dries.

Bubbles? The world is full of them, but the greatest share falls to the photographer while floating paper on albumen. Now, where a bubble adheres to the surface of the paper, a white spot will be manifested upon the printed proof. Therefore, the surface of the albumen must be kept quite free from these tormentors, and a piece of clean paper is all that is required to remove them from the surface. As to the strength of the salting solution, I consider 5 parts of chloride of ammonium to 100 parts of water, a maximum for all ordinary purposes. The time the sheet of paper is allowed to remain floating on the albumen had better be as brief as possible, consistent with completely imbuing the paper with the fluid. You will understand that the strength of the chloride of silver obtained on the sheet in the subsequent operations, is dependent upon the strength of the solution of chloride in this; it is slightly modified by the time occupied with the floating on the solution.

When you remove the sheet of paper from the surface of the bath, it must be done slowly and carefully, to avoid the formation of bubbles; the first drainings may flow back into the bath; the last drippings may be absorbed by a piece of bibulous paper attached to the lower corner of the paper. Use black pins for suspending the papers, as white pins are acted upon both by the salting and the silvering solutions, and a portion of the sheet becomes spoiled.

The paper, thus albumenized and salted, when thoroughly dry, may be kept for use for any length of time, in a drawer, or packed, free from contact of dust or foul air.

In my next, I shall edify you on the subject of sensitizing or silvering the paper.

Photographic Glossary.

Alcohol— or Spirits of Wine—an agent extensively used in photography. It enters into the composition of collodion; and is added to the developing solution, with a view of causing the fluid to flow at once over the plate. Alcohol is a solvent of the resins, hence useful in the manufacture of varnishes. It is also used for burning in the spirit lamp, producing great heat without smoke. Absolute alcohol is 75·25 above proof, and has a specific gravity of .796.

Alkalies—A class of bodies of which caustic soda and potash may be taken as the types. They are for the most part metallic or earthy oxides, possessing the property of neutralizing acids, and forming, by combination with them, an extensive class of bodies termed *salts*. Solutions of the alkalies change vegetable blue colours to green: the yellow of turmeric they change to brown. Volatile alkali is the name given to the solution of ammoniacal gas in water. Alkalies are the most powerful of the class of bodies termed bases. The acid and akaline conditions of solutions require to be carefully distinguished in photography: this is accomplished by means of *test papers*.

Amber—A fossil resin found chiefly on the shores of the Baltic Sea. Dissolved in chloroform it is used for making a varnish for negatives on glass, but cannot be recommended for that purpose, as it is extremely liable to be rubbed off with the slightest friction.

Ambrotype—A name given by American photographers to positive collodion pictures on glass.

Ammonia—A volatile alkali formed by the combination of hydrogen and nitrogen gases. It is very soluble in water: the solution is known as *liquor ammoniæ*. Its alkaline properties are very energetic; it is used in photography as a detergent; for toning in positive printing; and for forming the ammonia-nitrate of silver.

Amphitype — The name given by Mr. Talbot to a photographic process, invented by Sir John Herschel, which produces pictures that are both positive and negative, according as they are viewed by reflected or transmitted light; and to pictures produced by one and the same action of light, which become either positive or negative according to subsequent manipulations.

Analysis — The method by which the constituents of compound bodies are separated from each other, and distinguished by appropriate *tests* or reagents.

Anhydrous — A term signifying free from water. An anhydrous salt is one entirely free from water of crystallization. An anhydrous acid is an acid in its greatest state of concentration; many acids cannot exist without the presence of water.

Aperture — An opening. Lenses of a given diameter and the opening of a diaphragm are said to be of such an *aperture*.

Aplanatic — A term applied to lenses which are constructed so as to give images devoid of aberration.

Aqua Regia — A mixture of hydrochloric and nitric acids, used as a solvent for gold.

Areometer — An instrument for measuring the density of liquids; called also hydrometer, and sometimes densimeter.

Archerotype — A name proposed in honour of the late Mr. F. S. Archer, to be given to the collodion process.

Anthotype — A process in which the photographic agents employed consist of the vegetable juices of young plants and flowers, and of the alcoholic solutions of various resins.

Apparatus — The instruments, implements, &c., with which the operations of any process in photography are carried on, such as the camera obscura, baths, dishes, funnels, &c.

Argentine Salts — The salts of silver.

Argentometer — An instrument for testing the strength of solutions of silver.

Asphaltum — One of the names of bitumen: a substance employed in the early stages of heliography, by M. J. Nièpce, and latterly by M. Nièpce de St. Victor, in photographic engraving.

Astro-photography — The application of photography to the delineation of the celestial bodies.

Avoirdupois Weight — The weight by which all articles of commerce are sold. The pound consists of 7000 grains, while the pound Troy weighs only 5760 grains.

Azote — A name sometimes given to the gaseous element nitrogen.

Barium — A white metal with the colour and lustre of silver: combined with chlorine it forms chloride of barium, used in "salting" paper in the positive printing process.

Baryta — The protoxide of barium.

Base — All bodies which combine with acids and form *salts* are termed bases: the alkalies are the most energetic.

Bath — This term is applied to the various solutions used in photography in which paper and glass plates are immersed: also to the vessels in which the solutions are contained.

Benzole — A colourless, volatile liquid, used in photography as a solvent of bitumen, &c.

Benzoin — Commonly called gum Benjamin: dissolved in alcohol it forms a useful varnish for collodion negatives.

Bichloride of Mercury — Familiarly known as the powerful poison "corrosive sublimate." It is used in photography for strengthening weak negative pictures on collodion, and for weakening paper positives.

Bichromate of Potass — A salt much used in dyeing and calico-printing. It is also the principal agent in Mr. Talbot's process for photoglyphic engraving, and it is used in a positive printing process invented by M. Sella.

Biconcave — A biconcave lens is one in which both surfaces are concave. Such a lens renders the rays refracted through it divergent.

Biconvex — A lens is biconvex when both its surfaces are convex: the rays refracted through it are convergent.

Bromides — Combinations of bromine with various bases: those principally used in photography are the bromides of cadmium and of potassium.

Bromine — An elementary body which at common temperatures is a thin, volatile, red liquid of a very intense colour and suffocating odour. It is slightly soluble in water, more freely so in alcohol, and most abundantly in ether. In combination with other bodies it forms *bromides*.

Bronzing — When positive proofs are over printed the shadows assume a metallic lustre which is termed *bronzing*.

Buckle's Brush — This implement is formed of cotton wool inserted in a piece of glass tube, the cotton projecting. It is employed to spread solutions on paper in the calotype process, &c.

Buff — An implement used in the daguerreotype process for polishing the silvered plates. It is formed of a piece of wash-leather mounted on wood. Glass plates are also cleaned with a *buff*.

Cadmium — A scarce metal, found chiefly in the ores of zinc. The iodide and bromide of cadmium are extensively used in photography to form the sensitizing solution added to collodion.

Calotype — The name given to Mr. Talbot's process for producing negative pictures on paper by means of iodide of silver, developed with gallo-nitrate of silver.

Camera — A dark box of wood with leather or cloth sides fitted with a lens, opposite to which is placed the focussing screen, upon which the image formed by the lens is received. When a perfect image is apparent on the screen, the object is "focussed;" the screen is then removed, and the sensitive surface put in its place. There are many forms of camera adapted to various purposes.

Cap — The brass or pasteboard cover used to cover the lens of the camera while taking a picture.

Caseine — The cheesy portion of milk, which bears much resemblance to albumen. It is the active portion of whey or serum used in photography in the preparation of positive paper.

Foreign Correspondence.

Paris, January 10, 1859.

The interest excited by the researches of M. Nièpce de Saint Victor drew a very crowded audience at the *Académie* when M. Chevreul read the second part of the third *memoire* on the newly-discovered action of light. Whatever may be the estimation these researches are held in abroad (and I know that attempts have been made to decry their importance), here they excite a curiosity and interest second only to that caused by the daguerreotype itself. No one is better qualified to judge of their value, or estimate their importance, than M. Chevreul; and he has expressed himself honoured in being made the organ of communication by which they are given to the world,—and, further, he has himself read a communication supplementary to the researches of M. Nièpce, on "the influence of light on molecular action;" but more of this anon. I must now limit myself to an account of the further researches of M. Nièpce.

These later experiments were pursued with the same object as those last described. A sheet of Swedish filtering paper, sized only with starch, and then imbued with a weak solution of soda or potash, or of cyanide of potassium, and exposed to the sun's rays for about three hours, when treated with tincture of turmeric, yields an image which is yellow in the parts acted upon by the light, and red in the parts protected from its influence. When the paper is held to the fire, it is very rapidly carbonized in the solarized parts. Swedish filtering paper, if not sized with starch, does not produce the same effect.

A sheet of writing-paper sized with starch and exposed to the sun's rays for about three hours, reddens the blue tincture of litmus in the solarized parts, and the paper becomes *unsized*, or, at least, the sizing undergoes a change, for the paper is immediately permeated by water in the portions acted upon by the light; and this effect is more decided when the paper is imbued with soda or potash, or with iodide of potassium; but paper sized with gelatine is not *unsized* by the influence of light in the same time as a paper sized with starch.

Paper imbued with a neutral solution of nitrate of uranium is coloured a pinkish grey under the influence of light, and of a lighter or darker tone, according to the amount of humidity present. The image impressed on this paper will be of a very deep slate-colour if the paper has been imbued with the following solution:—Water 100 parts, nitrate of uranium 10 parts, nitrate of copper 5 parts; adding 2½ parts of yellow oxide of uranium to render the solution quite neutral. Lines traced with this mixture upon paper, and exposed while moist to the sun's rays, become coloured in a very short time; but it is remarkable that the colour disappears when the paper is put into a dark place, and is reproduced when brought again into the light,—and this change may be reproduced several times, till at length the paper ceases to change.

For the paper to become quickly coloured it must neither be too moist nor too dry, but slightly damp. Diffused light suffices to produce the colour quickly, and the longer the paper is exposed to it the deeper the colour becomes, and the longer it is in parting with it in the dark. If the paper is exposed too long to light it becomes permanently stained with a light greenish-yellow tint.

By means of paper imbued with starch, and afterwards submitted to the action of a concentrated solution of iodide of potassium, the action of a very feeble light is made evident. If a piece of this starched paper is submitted to the action of light for three hours, part of it being covered with an opaque body, then plunged into the indigo vat for about two minutes, and then put into water, upon being taken out, the paper, under the influence of the oxygen of the atmosphere, becomes coloured blue in the portion acted upon by light, while the other portion remains white!

Such are, by way of illustration, some of the curious results of the experiments carried on by M. Nièpce. They demonstrate — 1st. That in order for light to act upon organic or inorganic bodies, it is necessary that they be in a finely divided state, and in very thin layers — 2nd. That for the reduction and colouring of a metallic salt, it must be placed in contact with an organic substance, or of one of the three simple bodies—chlorine, iodine, or bromine—3rd. That the organic substance, after being submitted to the action of light, requires to be placed in contact with an inorganic substance.

M. Nièpce proposes to continue his experiments upon the vegetation and ripening of fruits, under the influence of the activity acquired by a solarized body. He has already obtained a result upon raisins contained in bags impregnated with tartaric acid. These researches are therefore not limited in their application to photography, but extend at once to dyeing and to horticulture.

By these researches I am reminded of M. Bayard, whose formula for a toning-bath I gave you in my last letter. M. Bayard is one of the creators of photography, and perhaps the most skilful we know in this marvellous art. Even before the publication of Mr. Talbot's processes, M. Bayard had himself discovered the means of fixing the images of the camera obscura; but by keeping the secret of his method he has missed the opportunity of obtaining universal renown. It is not generally known how he became one of the discoverers of photography; but as the fact is both curious and interesting, I may be permitted to relate it here.

M. Bayard is a clerk in the Treasury: he is the son of a justice of the peace, who resided in a small provincial town, and who occupied his leisure hours in cultivating a garden; his favourite fruit was peaches. It was his custom every year to send to his friends some specimens of this choice fruit, and naturally proud of his skill as an horticulturist, he sought for some distinguishing mark or sign by which his fruit should be recognised, and unwittingly he adopted a true photographic process. Selecting one of the finest peaches on a branch, to preserve it from the action of the sun, he enveloped it in leaves. When the peach, thus sheltered from light, had acquired the desired size, it was stripped of its covering, and freely exposed to the ripening and colouring influence of the sun. Only he first cut out in paper the initials of his name and glued them on to the peach. When, after the lapse of a few days, these paper initials were removed, the letters were found on the skin of the peach, of a brilliant white colour upon a red ground.

This phenomenon naturally attracted the attention of the younger Bayard, who amused himself with repeating the experiment in his own way, by employing rose-coloured paper, upon which he stuck various forms, such as crosses, &c. The parts of the paper protected by the superimposed figures retained their original rose-red colour, but the rest of the paper, when exposed to the sun's rays, became nearly white. Subsequently, when rumours of the wondrous achievements of Daguerre were spread abroad, he thought of using this rose-coloured paper as a sensitive surface for the camera, but of course without much success. His next step was to employ chloride of silver (the very agent now so generally employed); but the pictures he obtained in the camera were *positives.* His process consisted of exposing paper impregnated with chloride of silver to the action of light, but only to a certain degree, which experience had pointed out. When he desired to obtain a photographic picture he immersed this paper in a solution of iodide of potassium, and then exposed it to the action of light in the camera. The luminous rays had the effect of *bleaching*, or rather of rendering the salt of silver slightly yellow in the lights. The proofs were then fixed in hyposulphite of soda, and when exhibited at the Sorbonne, some twenty years ago, in fact before those of Mr. Talbot were made public, they astonished all who saw them. He sacrificed renown to the pleasure of keeping his secret.

But I must return from this episode to the researches of M. Nièpce, or rather to M. Chevreul's pendant to them. M. Chevreul, in his communication to the *Académie*, observes, that it is of the first importance to distinguish two conditions in the chemical action of light—one, in which, acting alone, it decomposes a body, or effects the combination of two bodies; and that in which it acts concurrently with a body upon a complex body. Various interesting experiments are given in elucidation of these conditions, which would occupy too much space if detailed in this place.

M. Chevreul further adds that the facts stated by M. Nièpce in his last memoir, are important, not only for their connection with our views of chemical phenomena produced by the action of light acting either alone or in conjunction, but also (and that is the novelty in these researches) its *action*, its *dynamic power*.

We are indebted to M. Nièpce for the knowledge that a large number of bodies are susceptible of acquiring, by solarization, the activity peculiar to light itself. Other phases of this inquiry remain, such as — 1st, to determine the activity possessed by a fixed inorganic body which undergoes no chemical action while it preserves its activity in the dark; and, 2nd, an activity resulting from a slow chemical action that light determines in solarized bodies, whether, these bodies being compound, this action exercises itself upon their elements, or whether these bodies undergo this action only in connection with the medium in which they are placed.

I must apologise for dwelling so long on these researches, but the vivid interest they have excited here leads me to hope that they will be no less interesting to you; in fact they have, for the present, thrown all other matters into the shade.

J. P.

Correspondence.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, George Shadbolt, 2, *Upper Hornsey Rise, London, N. All* Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

HIGHLY ALBUMENISED PAPER.

To the Editor.

Dear Sir — Will you allow me to correct an error into which the writer of the article on "Photographic Papers," in the *Photographic Journal* of the 1st instant, has, doubtless unwittingly, fallen?

In his rather sweeping condemnation of "highly albumenised paper," he says, that "it is to be regarded with suspicion, as the *very high glaze is not due to pure albumen, but to an admixture or adulteration, either dextrine or gelatine;*" and that "the presence of the latter is to be recognised *by the chocolate colour of the proofs when removed from the pressure frame, and if the wet proofs are allowed to dry in contact, they adhere together and are spoiled.*"

Although it is possible that some makers may use an admixture of gelatine or dextrine, I have never found it necessary or advisable to do so to obtain the highest glaze.

I send you, herewith, some specimens of different kinds of (foreign) papers, albumenised with *pure white of egg*, and I think you will find the *glaze* to be as much as it is possible to desire. Moreover, prints on these papers will, for the most part, come out of the printing frame of a somewhat chocolate colour, and will, if dried in contact, adhere together, showing that these latter conditions do not necessarily prove the presence of gelatine.

One thing you will doubtless remark on seeing these papers together, viz. — the great difference that exists in the tint as well as the texture of the papers themselves, as although they are all prepared in the same way, the tints will vary from the comparatively rather *dingy* Canson (which by the way has lately fallen off very much in quality) to the brilliant *pearly* white of that marked "New French," a difference that must have considerable effect on the tone of the finished proof.

I am, yours, &c. JOHN A. SPENCER.

[The tints of the various sheets sent us are certainly very different, and that specially named is very pleasing. Personally, we are not fond of highly-glazed paper, except for stereoscopic proofs, but that is rather a matter of taste. The article was written by a practised manipulator in printing photographic proofs. We are, however, obliged for Mr. Spenser's kind attention in pointing out the fallacy of the test relied on.—Ed.]

RESTRICTION UPON WORKS FOR EXHIBITION.

To the Editor.

Dear Sir—In the letter I wrote to you as published in your last *Journal*, you misconstrued my expressions, as if I had found fault with the council of the Photographic Society. I meant no such thing. I only told you how the resolution named affected me for the moment.

It is an open question, considering the increase in the number of manipulators, whether that measure, or throwing a greater amount of responsibility on the Hanging Committee, as to their judicious selection or rejection of works sent in, is best.

I will in another letter put down my opinion how this *open question* might possibly be practicably settled.—I am, yours, &c.

O. G. REJLANDER.

[We are sure that Mr. Rejlander's remarks, as published in our last, cannot be regarded as in any way offensive to the council of the Photographic Society, composed as it is of gentlemen whose desire to promote the welfare of photographers and the art they practice is unquestionable. We are convinced, on the contrary, that they are glad to have an opportunity of ascertaining how such a regulation affects those in Mr. Rejlander's position.—Ed.]

INK PRINTING PROCESSES.

To the Editor.

Sir—Permit me to congratulate you on the improved size and *general character* of your *Journal*. There is something in it which, in my judgment, commends it so much to the practical photographer, that I doubt not the number of your readers will soon be multiplied three-fold.

I was much amused with your remarks respecting the cool manner in which a M. Asser puts forth in the *Cosmos*, as *new*, the ink printing process mentioned by McCraw, which, you say, truly enough, is only a modification of that of M. Sella, which, further, allow me to add, is almost a verbatim description of a process discovered by Mr. Perry, and which, through me, was patented some twelve months *before* ever this Piedmont gentleman had written a line on the subject; so, that in fact, neither M. Sella nor Mr. McCraw has any more just claim to the *discovery* than M. Asser.

Before closing, I may further state, that Mr. Perry and myself, having tried various salts of iron and other metals in a thousand different ways upon plain, gelatinized, albumenized, and other papers, have come to the conclusion that the best picture is produced by first printing simply with the chromic salt, then treating the picture with the iron, and lastly, with the gallic or the pyrogallic in conjunction with acetic acid. In order, however, to preserve the purity of the whites, great care should be taken to wash well between each of the processes.—I am, yours, &c.

28, *Old Bond Street, London, Jan.* 6, 1859. T. SHARP.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

To the Editor.

Dear Sir—A slight error has occurred in the report of our November meeting, which please correct.

I allude to the remarks made by Mr. Johnstone, which should read—"I believe I was the first who suggested the crayon principle to the Rev. T. Meyler [not *Mayall* as reported] in 1851, which was successfully carried out by Mr. Mayall, in his patent revolving disc. Your insertion of the above will oblige, yours respectfully,

Jan. 4th, 1859. C. S. HAINES, *Hon. Sec.*

DEVELOPEMENT AFTER FIXING.

To the Editor.

Sir—I send you a few lines on the developement of collodio-albumen pictures *after* having dissolved out the iodide of silver in the fixing bath. I was induced to try the experiment, from having often re-developed pictures that were too weak after they had been fixed in the hyposulphite of soda solution; I therefore took a sensitive collodio-albumen plate, and exposed it in the printing frame for the usual time, then placed it in solution of hyposulphite of soda until all traces of the iodide of silver were removed from the plate. Having washed it well under a stream of water, and developed in the usual manner, the result was a good picture but of a *red colour*.

I find that they will develope quite as well in the dark room, and also that they will keep for days exposed to daylight, without altering the effect.

I have also tried the same process, using cyanide of potassium (one and a half grains per ounce of water) instead of hyposulphite of soda, and got a good picture with much better tone; but in the latter case it requires rather longer exposure, or will take a long time to develope.

With regard to the objectionable tone of the pictures after being in the hyposulphite of soda, I was speaking of it to a friend of mine, Mr. Parry, an old and able photographer, and he suggested toning with chloride of gold. I did so, and the result was a picture with a beautiful purple tint. I have sent you three prints developed as above.

No. 1, developed after fixing with hyposulphite of soda.
No. 2, " " " cyanide of potassium.
No. 3, half-toned in the chloride of gold bath.

I am, yours, &c. J. H. YOUNG.

[The proofs received fully bear out the statements made, being quite distinct and sufficiently dense. We have little doubt that a very important principle in the practice of photography, upon dry plates, is here opened up. We shall certainly recur to this subject again.—Ed.]

TO OUR AGENTS AND ADVERTISERS.

It is announced in another column, that with our next publication will be tried the interesting experiment whether or not photogalvanography be suitable for the economical illustration of books, &c. With the "Journal" of the 1st February will be PRESENTED to our Readers, a picture worked on stone, from a plate prepared by Herr Paul Pretsch's patent. As there will doubtless be a vastly increased circulation on that date, our Agents will oblige the Publisher by forwarding an EARLY intimation of the number they require. Advertisements should also reach the Publisher not later than the 25th of the present month.

*** *As additional Agents are required for the Sale of this Journal in all localities where none have yet been appointed, the Publisher will be glad to receive applications from suitable persons, addressed to him at* 32, Castle Street, Liverpool. *Beside the Wholesale and other Agents for the Journal already in the Metropolis, the Publisher is desirous of appointing other Sub-agents in London and its suburbs.*

ANSWERS TO CORRESPONDENTS.

J. B., Darlington, is thanked for his suggestions.

James Braby—Messrs. Smith, Beck & Beck, 6, Coleman Street, City, will supply you with the article you require.

P. S. D.—Hyposulphite of soda must be employed for clearing Fothergill's plates, as well as those by Taupenot's process. If you use cyanide of potassium you will certainly spoil your negatives.

Quasimodo—If you get Hardwich's "Photographic Chemistry" (Churchill), you will find all you require. We advise you to wait a few weeks, as we know that a *fifth* edition will be out very shortly.

T. B.—We have not seen the arrangement for stereoscopic pictures, described in a recent number, as having been exhibited at the Photographic Society of Scotland.

Nil Desperandum, &c.—The rest of your signature is too complimentary for insertion. We think *both* processes would yield good results, and any good collodion is suitable. We will endeavour to attend to your third query in our next.

Twaddle—We cannot help what other persons allege as stated by us. We refer you to our own pages for our own assertions, and if others will misquote us, either by accident or design, we cannot be held responsible. We never made the statement you mention.

Stereo—We have long since abstained from noticing rude and foolish statements in the publication you name, and do not intend to treat the present one in a different manner. If you will refer to our article on the subject, you will find our contemporary has made either an *absurd mistake* or a *wilful misstatement*.

Juvenile is surely joking when he recommends brimstone and treacle, with acetic acid, as a *new dry process*—at least, we should have thought so, only those who intend practical jokes do not usually send their real name and address as our correspondent has done. It is true, that in the formula he gives, the brimstone is filtered out; but to what end is it first added? The mixture, when made, is but a very inferior kind of oxymel, and nothing whatever new in principle is introduced. We strongly advise all who wish for good pictures to *avoid* the brimstone, at least.

Spectemur Agendo—Without any question the *last*-named of the three producers which you mention is the one you should apply to; moreover, he constructs them for the purpose you require *specially*, and *not* to be used for the other one, for which you are already supplied. The pin-hole blisters would probably be avoided in the collodio-albumen process, by letting the collodion *set well* before sensitizing, and also drying the albumen perfectly *by heat*, before the final immersion in the bath of aceto-nitrate of silver.

John Simpson will find the information he desires relative to colouring glass positives in our last volume, pages 193, 206. See also a pamphlet by A. N. Rintoul on this subject, and a chapter on the same in the "Photographic Teacher," by G. W. Simpson.

Received—A. R., Glasgow.

Erratum—There was a typographical error in Mr. Hardwich's paper "*On Gold Toning on Albumenized Paper*" in our last number. The chloride of gold solution should contain one grain per *drachm* of water, instead of per *ounce*, as printed.

☞ *To meet the pressure on our space, owing to the numerous reports of meetings, a large temporary increase of pages has been made in this number of the* Journal—*notwithstanding which, several interesting articles in type are left over, including the conclusion of the Editor's paper on* Suggestions for the Improvement of Landscape Photography, &c.

THE PHOTOGRAPHIC JOURNAL.

No. 87, Vol. VI. — FEBRUARY 1, 1859.

As indicated in our last, we have now put to the test of actual practice the suggestion thrown out by Herr Pretsch, relative to book-illustration by the assistance of photography; and though the present is the first attempt to produce any very large number of copies from a single original negative, we have undeniable evidence not only of its feasibility, but of its practical utility and economy, and are prepared to show that there is no reason whatever why *a hundred thousand copies*, or more, of good serviceable illustrations may not be thus produced from one photograph.

When we made the promise of presenting with each copy of the present number a specimen, provided the experiment should turn out successfully, we did so under the impression, that with Herr Pretsch's permission and promised assistance, every impediment to our performance of it was removed; but within the last few days we have received an intimation from the Hon. Henry Fox Talbot, that by carrying out our expressed intention we should, without first obtaining his sanction, be infringing a patent granted to him in 1852. We are of course not in a position to decide upon the validity or otherwise of patent rights, nor do we know in what particular manner the alleged infringement would occur; but it would ill become us, even if we had the inclination, to contest the point with a gentleman to whom we, in common with all photographers, owe a deep debt of gratitude; we have therefore sought for this gentleman's sanction to our issuing the proofs we have prepared, and this permission he has liberally accorded, consequently our readers have before them the means of judging how far the attempt has been successful, to place within their reach a method of cheaply and economically producing a very considerable number of illustrations, available for commercial or other purposes.

Before giving, as we intend to do, a short descriptive outline of the various steps in the production of the finished lithograph, as now presented, we desire to make a few preliminary observations, in order to avoid any misapprehension as to the object in view. It is not intended to supersede the present method of photographic printing in any of its forms; it is not regarded as of any aid to photography, but on the contrary, as *borrowing from photography* a certain amount of assistance which enables any person to procure for circulation or illustration very many copies of any object whatever: this is the point in which *photographers* are interested, as there is not one amongst us who may not possibly hereafter be called upon to play his part in the operation. But as it is not for the purpose of producing *photographs* that our labours are directed, we get what assistance we can from photography, and obtain the rest of our requirements by any other means at our disposal, the two main features being to acquire a certain something at the least possible cost.

It is in consequence of a remark recently made by our able predecessor in the editorial office, Mr. Malone, at one of the meetings of the Photographic Society, that we have been induced to follow out thus far Herr Pretsch's suggestion, which we now more particularly explain.

A negative was taken upon collodion in the ordinary way by Mr. Fenton, from this a transparent positive upon paper was produced by direct contact. With the transparent positive an impression in relief upon a mixture of gelatine and bichromate of potash was obtained by the agency of light; from this a mould in some plastic material, upon which copper was deposited by means of the electrotype process, and thus a copper *matrix* was produced, capable of affording, by subsequent assistance from the electrotype process, a number of copperplates more or less fit for printing with in the ordinary manner of using copperplates for this purpose. All this has been already explained at length in our last, and also in some previous numbers of this *Journal.*

At this stage an option is presented to the operator: he can either make any desired additions or corrections to his plate by calling in the services of a copperplate engraver, or delay the "touching" till a subsequent period. Should the number of impressions desired be very large, it is perhaps, most economical to correct the plate itself, but if comparatively few, then the amendments are better delayed. In the sample before us, the corrections were made on the copperplate.

An impression was next taken in the copperplate press — but instead of its being upon ordinary paper, it was upon that kind employed by lithographers to receive the writing or drawing intended to be transferred to stone, and the transfer was effected in the ordinary manner employed in lithography, the marginal lines and lettering being subsequently added.

Any desired "touching" can be now added instead of performing the operation upon the plate, and as the requisite skill is more easily acquired for "touching" lithographs than copperplates, it is of course less costly; but on the other hand, if it be done upon the plate, we are enabled to prepare a large number of stones to print from simultaneously, (with only once doing the work of correction), where it is advisable to work off many impressions, especially if they are required in a short space of time.

Such is the method by which the print now before our readers has been produced; and we cannot but think that Herr Pretsch has placed before the public a most important means of economical illustration. Amongst other applications of it, how cheaply and rapidly could books of manufacturers' patterns be got up, with a fidelity that would render them invaluable, in many cases obviating the necessity for the carriage of bulky samples, and in others affording all the advantages of the exhibition of samples, when from the nature of the goods such actual exhibition is altogether impossible. In the first category we may place articles of hardware, glass, ceramic manufactures, and such like; in the second — stoves, grates, furniture, &c., &c. Again, patterns of valuable lace, &c., could be multiplied at a trifling cost, and transmitted in all directions by post.

Should the public take up this matter, we have no doubt that any trifling difficulties as regards patent rights will be most easily got over.

In conclusion, we give a letter from Herr Pretsch, affording some further interesting particulars, in reply to some queries of ours.

162, *Great Portland Street, W.*

My Dear Sir, *January 22nd*, 1859.

The original of the plate which you are going to publish, I still keep in my hands; it is an ordinary positive on paper, not too thick. Real transmitted positives on glass answer far better, especially if they be taken from larger negatives on glass. A soft tint over the

original, with not too much contrast between light and shade — not too white and black — produces brilliant pictures. However, in many instances I have also obtained brilliant plates, leaving nothing to be desired, from some French positives on paper, bought in some of the shops in London. They have been mounted. I took them off from the stout paper carefully, and made them a little more transparent by means of diluted Canada Balsam, that is all.

I am convinced, that although my process yields at present very nice results, nevertheless a great deal more can be done by it — things which are not dreamed of now.

Concerning the touching up of a transfer on the stone itself, it might require a man possessing technical experience, artistic feeling, and good will, but I am sure it can be done. Believe me to be, dear Sir,

Yours faithfully, PAUL PRETSCH.

The Council of the Photographic Society held a soirée at the Exhibition Room in the Gallery of British Artists, Suffolk Street, Pall Mall, on the 20th ult., at which a large number of members of the society and visitors, including many of note in the scientific world, were present. The gathering was also graced by the presence of a considerable number of ladies; and judging from the animated conversation which was everywhere carried on over the numerous specimens exhibited, the photographic art appears to gain increasing favour with the fairer sex.

We were happy to notice, that the president of the society, Sir Frederick Pollock, was able to do the honors upon the occasion, which we had feared, from his recent indisposition, would have been too severe a tax upon his energies.

It is with much pleasure that we have to record the more intimate union of the principal photographers of Liverpool than was possible while simply forming a portion of the Historic Society of Lancashire and Cheshire. By the latter connection, the scientific part of their progress is duly cared for; but photographers are but men, and they require something besides this—they require a more informal and unrestrained intercourse, for the purpose of a friendly interchange of ideas upon little matters of detail, that are insufficient of themselves to be discussed in a scientific assembly, yet go far to make up the experience and knowledge essential to constitute a skilful manipulator. To meet these desiderata, the principal men amongst those practising our art in Liverpool and the neighbourhood, have formed themselves into a friendly club, meeting periodically to discuss the points of immediate interest over a cheering cup of tea. We have no doubt that this is a move in the right direction, for "out of the abundance of the heart the mouth speaketh." It is therefore not only calculated to further the interests purely photographic, but what is of quite as much importance, to engender a feeling of sympathy and kindness, that we have always found conducive to progress. We most heartily wish them success.

[Mr. Greenwood, like any other correspondent, conceiving that he has been attacked without just cause, demands space for the following reply.

We regret the introduction of any personal matter into our columns at all; but as the letter is explanatory of matters that materially concerns our readers, we feel bound to admit it.—Ed.]

Dr. DIAMOND and "Mr. GREENWOOD."

As Dr. Diamond, the editor of the *Journal of the Photographic Society*, has thought fit to introduce my name into a misleading and disingenuous paragraph with respect to this *Journal*, in his publication of the 21st January, I think it courteous and due to my supporters to explain certain circumstances connected with the recent alterations, and then leave my readers to draw their own conclusions.

For a considerable time past I have had numerous hints from friends having business relations with this *Journal*, that the omission of the local prefix, "Liverpool and Manchester," in the title would be beneficial, on the ground that those words in appearance (though not in *reality*, as was shown by the suggestions coming from places very wide apart) implied local restriction, and thus were calculated to be injurious to the interests of the *Journal*—while I, as proprietor, felt ambitious of representing photographic art throughout the world, without being confined to the specified localities named in the title, or indeed to any others.

These friendly hints (often received) remained for a considerable period unheeded. The intimate and cherished relations which this *Journal* has for so many years maintained with the early and earnest photographic workers in Liverpool and at Manchester—the many acts of kindness experienced, both personally and in connection with the *Journal*, from my friends in this town and the neighbouring city—naturally made me unwilling to sever the friendly ties which bound my publication to its earliest and warmest supporters.

However, during the past year, this *Journal* became the official organ of Societies in other localities. Its columns became filled with matter from the new as well as from the old world—the artists of Australia as well as those on the Continent of Europe became more interested in its contents—and even India became a claimant for its share of representation. I therefore thought it an imperative duty to myself and to my supporters to sink the local in a more general name—or, to speak more strictly, to change the position of the local designation, and to carry it, with additions, below, instead of leaving it above, the general title,—thus securing three objects:—

1. The retention, intact, of the leading line of the former title — the words "PHOTOGRAPHIC JOURNAL."

2. The assertion of the fact of its *universal* representation of the photographic art.

3. With the two former objects attaining the no less pleasant and useful one of preserving my friendly connections with Liverpool and Manchester, and fully meeting the requirements of business correspondents.

Having arranged matters thus far to my satisfaction, I next, like an honest, unsuspecting, business man, announced the contemplated change of title, size, and editorial arrangements, in my own *Journal*, in the *Journal of the Photographic Society*, in the *Athenæum*, and elsewhere, some time prior to the change taking place — never suspecting that aught but what was straightforward and upright was involved in the announcement. But, lo! a few days before the first publication of the altered *Journal*, and when the number was far advanced in arrangement, Dr. Diamond registered *a* Journal under the title of the *Photographic Journal* — thus attempting to "filch from me my good name." No time was lost in ascertaining whether the steps I had taken were *legally* and *morally* right. The "opinion" of an eminent special pleader, in reply to the "case" laid before him, fully justified every step. I felt bound to keep faith with the readers of my *Journal*, and I brought it out with the previously-announced title of *The Photographic Journal* — which I had, as I was advised, a perfect right to assume.

Then followed a letter, signed "Parke and Pollock," threatening me with an application for an injunction if a second number should appear with the title objected to; which letter I handed over to my solicitor, instructing him to take the necessary steps if the threatened application were made.

This document was followed by the "special pleading" of Dr. Diamond in his *Journal* of the 8th January, in which he laboured to attach blame to me for assuming my title, a title which I felt I had an indefeasible right to use. In the "shorthand of the trade," Dr. Diamond said, the Society's *Journal* was known as the *Photographic Journal*, &c., &c., &c. I have had a tolerably extensive and increasing correspondence for some years, in connection with this publication, in which allusions to all existing Journals have frequently occurred; but never, to my recollection, except in one instance, was the *Journal of the Photographic*

Society ever styled the *Photographic Journal* in all this correspondence. The "London Journal" and the "Society's Journal" were the appellatives used, where other than the correct title was introduced. It may be, I grant, that correspondents (who are not usually precise, or do not care to be technically correct), in addressing the Editor or Publishers of the *Journal of the Photographic Society*, have frequently addressed letters as to the *Photographic Journal;* but so they have, in innumerable instances, to this *Journal.* I would not, however, be so unreasonable as to ground an arbitrary *right* to a title on such mere conventional terms. If Dr. Diamond, his predecessors, or the Council felt they had an exclusive right to the title, why did they not take it long before my announcement, instead of appearing before the world for so long a time as the mere organ of the Photographic Society? Why solicit advertisements by notes, headed "*Journal of the Photographic Society*," as received by myself? What means had I of knowing, prior to the recent allegation made by Dr. Diamond, that the Society's publication was known as the *Photographic Journal?* Certainly, it must have been by intuition, if at all, seeing that the title plainly printed on the cover, at the head of every page, and on its circulars, was—the *Journal of the Photographic Society.* I may add, also, that I could not discover any thing to the contrary in the publication itself, in its announcements, or in the recent determination of its conductors, accompanied by threats, carefully to prevent the papers read at the meetings of the Photographic Society appearing elsewhere till they had been published in the columns of the Society's *Journal*,—on the plea that they, as well as the *Journal*, are the property of the Society. Notwithstanding Dr. Diamond's assertion to the contrary, I believe it has rarely, if ever, been quoted other than the *Journal of the Photographic Society.* I certainly have never seen it otherwise quoted, although my long connection with the newspaper press has given me ample opportunity of so doing, had it been so. Indeed, excepting in the foreign Photographic Journals (which are largely made up of matter from their English contemporaries — my own being extensively used), I have rarely seen it quoted at all. A few weeks since, in one of the French Journals, the old and full title was given in connection with an extract from the former.

The very arguments Dr. Diamond recently put forth to restrain a contemporary from anticipating the Society's organ in the publication if its reports, showed, as plainly as an intelligent writer could put it, that publication to be closely bound up with the Society, or the Society with it (which is about the same thing), not only in its position as the Photographic Society's organ but as its property.

With respect to another notable argument, by which Dr. Diamond labours to sustain his case, viz., that the *Journal* account was kept under the designation of the *Photographic Journal*, I must plead ignorance of that fact, — not having had the privilege of looking into his publishers' ledger, to see how the account had been kept; but all good book-keepers, it is to be presumed, would lessen their labours by using a short designation instead of a very lengthy one. Perhaps, too, the publishers' ledger is of rather portly dimensions, and of ancient date, and the account may have been opened in the infancy of the photographic art, ere the *Liverpool Journal* had started on its successful career, and when the Society's Journal was in reality the only one in existence.

The "shorthand of the trade!"

It is the *long* hand of common sense and common fairness that I wish to be guided by in my business, and by the latter I was guided when I announced the *modification* of the old title.

Dr. Diamond has the interests of the Society's property to look after!

Well! I have my *own* interests to guard; and I *personally*—and not a wealthy Society — should have to bear the consequences if my *Journal* property were ruined by uncalled-for changes. My own experience, gained by years of toil, anxiety, and care, in building up the fortunes of this *Journal*, prompted me to make as little alteration in the title as was absolutely necessary.

I have also had to bear and will "*for the present*" have to bear, the consequences of the confusion caused by Dr. Diamond having — in a moment of unreason — rushed to Stationer's Hall, and registered *a* something under what is *my* unquestionable title. *I* have also received a communication from the Postmaster-General respecting the "confusion" caused by the contested title of the *Journals;* but I think my explanation showed pretty plainly that the "confusion" was *not caused by me.*

I will close these lengthy remarks — called forth by Dr. Diamond's allusion by *name* to me, in his issue of the 21st January — by further stating that while my publication of the 15th January was in course of being printed off, I received another missive, signed "Parke and Pollock," threatening that if a second number of *The Photographic Journal* should appear with that title they would —— what?—apply for an injunction to restrain me from using it! What new circumstances called for this second "paper pellet?" I beg to assure Dr. Diamond and the Council of the Photographic Society, that my career in life has been so little litigious I did not require to have a legal threat sent me in duplicate to keep me in remembrance of my position:—however, the latter letter has passed as quietly as the former into the safe-keeping of my solicitor, to whom I have requested all future communications from the same quarter to be addressed.

In conclusion, I have to state thus publicly, that while I exceedingly regret the collision between the Council of the Photographic Society (which body I willingly admit has done much for the advance of photography) and myself, caused, I believe, by Dr. Diamond's precipitancy and vain fears for his *Journal*, I am much better prepared to defend my right to the title of *The Photographic Journal* than I think Dr. Diamond can be in defending his own conduct in endeavouring, by his questionable proceeding, to circumvent me in carrying into effect my publicly-announced change in the title of this *Journal.* With care, attention, energy, and an intelligent application of capital to all its departments, including the acquisition of the best obtainable editorial talent, together with that of able coadjutors, it shall not be my fault if the *old* "Liverpool and Manchester Photographic Journal" do not become THE *Photographic Journal* of the Country!

HENRY GREENWOOD,
PROPRIETOR OF "THE PHOTOGRAPHIC JOURNAL."

ON THE DELINEATION OF MICROSCOPIC OBJECTS BY PHOTOGRAPHY WITH ARTIFICIAL LIGHT.

By M. S. Legg.

(Read before the North London Photographic Association, 27th Jan. 1859.)

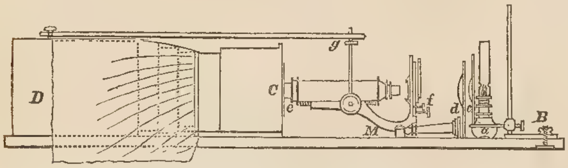
At this season of the year when out-door photography is for the time suspended, I have been endeavouring to carry out the principles laid down by Mr. Delves and others, in combining the microscope and the camera, with a view to obtaining enlarged representations of minute objects; and, as a *demonstration* of my mode of operation may be interesting to the members of this Society, I am induced to bring before you my apparatus, which, although homely, has enabled me to produce pictures which give promise of future success.

As a foundation I have a plank of deal, eleven inches wide and five feet in length, upon which are fixed along a central line various means of securing the several parts always in the same position, so that on commencing operations but little time is lost in adjusting, &c.

The source of light (a small camphine lamp, *a*) is placed in the ring of a retort stand, *B*, which stand is secured by a nut and screw to the board.

The rays of light are condensed and rendered parallel by means of two bull's-eye lenses, one about two inches diameter, *c*, brought almost close to the lamp, and the other about three inches diameter, *a*, within an inch of the first. The amount of light obtained by this means enables me to take pictures with the 2-3rd and 4-10th

powers at a distance of three feet from the object glass to the sensitive plate, and I have not yet obtained any advantage by attempting to concentrate the rays upon the object by further appliances. I am therefore inclined to think that success much depends upon having parallel rays, and the amount of light is quite sufficient for moderate powers.



The microscope (one of Smith and Beck's, M) is furnished with a tripod foot, which, in this arrangement, I remove—I also dispense with the bar carrying the mirror—it is then placed as it were on its back, and secured by a notch on the board, the body being in a horizontal position, and at a sufficient height to correspond to the front of the camera—the eye-piece is taken out, and the compound body slipped on to a tube, *e*, fitted to the sliding front of the camera, *C*—this tube is lined with black velvet to prevent reflection of the rays passing from the object-glass.

The camera is kept in its place by a slip of wood screwed to the board on each side, so that its motion is confined laterally, but it tranverses quite freely lengthwise.

The apparatus being thus arranged, I am enabled to use the stage adjustments, *f*, and focus the object on the ground-glass screen without difficulty, but the field of view is limited to about two and a-half inches diameter. I have therefore allowed the rays of light to pass on through the front of a second camera, *D*, in order to obtain a flat picture of four inches diameter, extraneous light being cut off by means of a black cloth; but here a difficulty arises in focussing at this greater distance, it being impossible to see the focussing screen and adjust at the same time. This however, is obviated, by adapting a kind of crank and lever movement, *g*, attached to the milled head screw, and passing over the top of the cameras, thus giving the focus with the greatest nicety.

The above description is that of my own apparatus, in which I have adapted to each other such parts as are used for other and separate purposes; but whatever be the make of microscope or form of camera, the principle is the same—which is, to adapt each part to the *axis of the microscope*, to employ as nearly as possible *parallel rays of light*, and, if desired, to obtain a large field, *to extend the rays* to a distance of three or even four feet before reaching the focussing screen; indeed, I see no reason, by employing the sun's light, why the rays may not be extended to any reasonable distance, by using a long camera and lengthening the focussing rod.

The object glasses I employ are (like the microscope) those made by Smith and Beck. Until lately, I have acted upon the experience of our worthy vice-president, in adjusting for the difference of the chemical and visual foci, and which I quote from *Hardwich's Photographic Chemistry*:—"An inch and a-half objective of Smith and Beck's make required to be shifted 1-50th of an inch, or two turns of *their* fine adjustment; a 2-3rds of an inch, 1-200th of an inch, or half a turn; and a 4-10ths of an inch, 1-1000th of an inch, or about two divisions of the adjustment. With the 1-4th and higher powers, the difference between the foci was so small as to be practically unimportant;" but I have lately had added to each of my 1-100th and two and three inch objectives, a lens of low power, which effectually corrects the focus without any further adjustment.

In regard to objects upon which to experiment, I find those possessing but little colour the best, those having any amount of red or yellow stopping the actinic rays and affording scarcely any detail. This point, however, is one of which I hope to speak more confidently at a future period.

Having thus described the mechanical and optical arrangements of my method, I will just observe, that in taking the pictures I use ordinary negative collodion; sensitise in a slightly acid bath, and develope first of all with iron solution, which brings out the picture with all its details in one or two minutes, and then (if it appear satisfactory) intensify with pyrogallic acid. This latter part of the process is rather tedious, occupying from fifteen minutes to half an hour. The time of exposure of the plate varies from three to ten minutes; if the object be very transparent, like the spicula of sponge or Gorgonia, three minutes will suffice; for vegetable tissues, four or five minutes; and for parts of insects, having a certain amount of colour, ten minutes will sometimes be found necessary.

SUGGESTIONS FOR THE IMPROVEMENT OF LANDSCAPE PHOTOGRAPHY, WITH HINTS FOR THE ENLARGEMENT OF NEGATIVES.

By the Editor.

[*Concluded from page* 318 *of the Liverpool and Manchester Photographic Journal.*]

For certain reasons which I shall give presently, it will be best to employ the smaller of the two surfaces as the curved one; one of them being, that by so doing, an advantage is gained in superior definition at the edges if the negative be taken direct upon it. There would be no difficulty in procuring the necessary curves, by employing a set of watch glasses, all cut from the same or similar sized globes of glass, and that which presents itself at once to the mind of a photographer, viz., the coating with an even film of collodion is altogether imaginary, as I am assured by Mr. Skaife, of Blackheath, who kindly showed me some that he had done, and which were most perfectly and evenly coated, as he stated, in precisely the same manner as flat plates.

Assuming, then, that we set out by taking small sized negatives upon concave surfaces, the next consideration we have to decide upon, is the form of lens best adapted to effect the requisite enlargement.

It is not necessary in this part of the process that the lens should include any large angle of vision, because we can regulate the distances of the object and sensitive film from the lens relatively, so as to meet the requirements to ensure the desired degree of amplification. The larger the diameter of the lens, however, for any given focus, provided it be properly corrected, the more rapid will its action become: and this quality is of some importance, as the amount of exposure required for an enlarged picture is as the square of its linear increases in size.

To any one, who like myself, has been for many years devoted to microscopical investigations, coupled with a particular love for optical science, it appears truly absurd to suppose that any insuperable difficulty should exist in producing a compound lens, capable of rendering the most minute details of any photograph with the utmost delicacy and fidelity.

If we employ a negative upon a concave surface, a well-made portrait combination ought to give a fair result, provided the enlargement be but moderate—say not exceeding four or five diameters; but if we desire to increase the size in a much larger ratio, I cannot but imagine that a compound lens, constructed upon the same principle as that employed by the best makers for the production of *microscopic objectives*, of low power, might be most advantageously resorted to; and as the relative proportions of curvature for all the surfaces of the various component parts, compared with the refractive and dispersive powers of the kinds of glass employed, are already known, no further calculation, beyond a simple multiplication of the length of radii, and distances of the component parts would be necessary. The peculiar properties of the compound lens to which I allude, were discovered by Mr. Joseph Jackson Lister, F.R.S., some five-and-twenty years ago, and then described in a paper read before the Royal Society; but it is only within the last two years that some of the most valuable qualities have been developed in practice, though well known and remarked upon theoretically by Mr. Lister at the earlier period.

It may not be uninteresting to indicate, in few words, the principle upon which these lenses are constructed.

Mr. Lister found, by direct experiment, that an achromatized plano-convex lens possesses two points in the anterior focus, from which images formed in the conjugate foci become *perfectly corrected*, while, from any other points, they are only approximately so. Moreover, if a point be selected *between* those producing perfect images, the error remaining is found to be in an *opposite* direction to that arising when the point selected is either nearer to, or farther from the lens than the two perfect points.

He, consequently concluded, that by judiciously combining a pair of achromatized lenses, at such a distance apart, that a ray proceeding from the nearer perfect focus of the front lens, and transmitted to the second, in a direction *as if proceeding from its more distant* perfect focus, any deviation in position of the object examined would cause an error in one direction by the first lens, that would be exactly counterbalanced by an equal one in a contrary direction, produced by the second combination, and thus a constant equilibrium obtained.

On trial this theory was found to be correct, and I cannot perceive any reason why we should not avail ourselves of it for the purpose at present under consideration.

It is highly probable, also, that the peculiar combination recently introduced for photographic purposes, by Professor Petzval, if reversed in position, might be found admirably adapted for enlargement, and I am strongly of opinion that this would be the case.

Let us now proceed to the practical application of the principles we have been endeavouring to establish.

We first adapt our dark slides to receive circular concave glasses, of about two-and-a-half inches in diameter, and have a similar one, previously lightly ground on the concave side, mounted as a focussing screen.

Instead of grinding, we may coat it with collodion, sensitise, wash and dry it, in which condition it will answer admirably for focussing upon.

Having prepared the necessary chemicals, we coat our glasses, sensitise in the ordinary way, expose for a fraction of a second of time, and develope at once. The collodion film may be thin and the negative very weak, provided that the details are all obtained. On no account must the developement be pushed too far, as the subsequent operations afford us every opportunity of increasing, to any desirable extent, the contrasts between the lights and shadows of the picture. Perfection of detail and *absence of density* is what we aim at.

If we content ourselves with one uniform extent of enlargement in all cases (say five diameters), our subsequent operations are very simple: in this case we should have a camera some seven or eight times the focal length of the lens employed (which we will suppose to be of about eight inches from the optical centre), consequently about six feet in focal length, and of dimensions sufficient to receive a plate ten inches by eight. At one end a groove is made to receive the usual dark slide. The whole should be lined with black cotton velvet, and a division inserted at about one foot from the end to receive the lens. A frame to hold the negatives should be adapted to the end nearest the lens, and be capable of adjustment nearer to or further from it; which adjustment should allow of being performed from the opposite end of the camera, a matter of but trifling difficulty. A negative, with the collodion side towards the lens should then be placed *in situ*, and being turned towards the sky, is to be very accurately and carefully focussed, by aid of one of Ramsden's eye-pieces (described by me in a recent number of the *Liverpool and Manchester Photographic Journal)*, when the whole will be ready for taking the enlarged picture, which is done in precisely the same manner as an ordinary picture is taken, the exposure required being, however, 5 times 5=25 times longer than that necessary for a picture of the same size as the original. The result will be a *transmitted positive*, which, although it may be allowed to exceed the original in density, should be rather full of detail than particularly intense.

From this transmitted positive thus obtained, *a number of negatives* (a point of considerable importance, where many proofs are required in a limited time) may be produced by any of the dry processes, the plates being brought into *actual contact*, to which end perfectly flat pieces of plate glass should be made use of, and these negatives can be used for producing prints upon paper.

It is because the two last operations are to be performed by actual contact, viz., the production of the enlarged negative, and also the printing, that the smaller of the two surfaces was that selected from the curved one.

From such experiments as I have been able to perform in reference to this subject, I am perfectly satisfied, that with a very moderate amount of patience and perseverance, some admirable results may be obtained; and it is a source of considerable regret to me, that my constant occupations, either in business matters, or in conducting *The Photographic Journal*, precludes the possibility of my devoting sufficient time to the carrying out to perfect fruition the ideas I have had the honour of laying before you.

It is, however, with a hope that some of my Liverpool friends, whose energy and perseverance in the cause of photography are well known to me, may be induced to devote some attention to a course, in which I am convinced that good fruit is to be found, that I have selected the subject I have brought under your notice, and I thank you heartily for the kind feeling which induced you to call upon me to do so.

NITRATE OF SILVER BATH FOR POSITIVE PRINTING.

The sensitising bath, upon which albumenised paper is floated, sometimes acquires a deep colour, which may be removed by kaolin, pipe-clay, or fuller's earth; but a readier mode is to add to the bath eight or ten drops of a solution of chloride of sodium, of the strength of twenty grains to the ounce of water, and shake it it violently immediately before any precipitate is formed, and repeat the operation a second and a third time, if it be required. The solution allowed to subside becomes quite limpid. About thirty minims of the salt solution is sufficient for twelve ounces of silver bath.

A CONTRIVANCE FOR INSTANTANEOUSLY VARYING THE SIZE OF ORIFICE, BETWEEN THE LENSES OF A PORTRAIT COMBINATION WHILST WORKING.

FIG. 1.

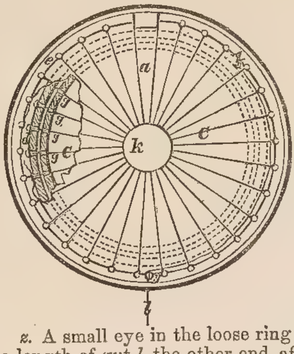


Figure 1 is a front elevation, and figure 2 a longitudinal section of the diaphragm placed in the lens mount.

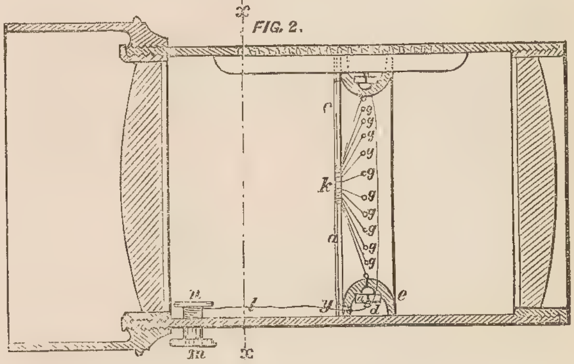
e. A brass or wood ring, with flanges, made to fit into the lens tube like an ordinary stop.

a. A thin sheet of India-rubber, secured round the edge of the front flange.

c. Silk or gut stretchers fastened at one end in the holes *a* round the front flange, the other ends pass through the centre hole *k*, through the holes *g* (see section), and are then secured to the ring *d*, working loose between the flanges.

z. A small eye in the loose ring *d*, in which is secured one end of a length of gut *l*, the other end, after passing over a portion of the outer circumference of *d*, and through the hole *y*, in the front flange—is then fastened to the reel *n* (clearing the focussing rack and pinion).

FIG. 2.



m. A stud screwed into the reel *n*, from the outside of the lens tube, the turning of which will wind on the gut *l*, bring the loose ring *d* into motion, pull up all the stretchers, and produce any sized orifice from a quarter of an inch up to full aperture of lens.

During the past summer I tried various modes of producing the same effect, but found the above *much the best* in every respect. An index may be attached to register the diameter of orifice produced at each change.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

At the monthly meeting of the above Society, held at Myddleton Hall, January 26th, Mr. W. Hislop, F.R.A.S., in the chair, the minutes having been read and approved, a paper was read by Mr. Legg, "*On the Delineation of Microscopic Objects by Photography, with Artificial Light*," [see p. 31] on which a discussion ensued.

The Chairman was of opinion, that the best method was to take a negative of about one inch in diameter, and enlarge from that, the definition being better, exposure shorter, and the result in every respect more satisfactory; also, that natural was preferable to artificial light, reducing the exposure one-third or even less. He also recommended Mr. Wenham's method of correcting the object glass of the microscope, by placing behind it a common spectacle lens. He kept about a dozen of these lenses at hand, varying from three inches to three feet focus, and by a simple arrangement in the brass tube holding the object glass, it was only necessary to drop in one of these lenses, keeping a register of the one producing the brightest image; much time and vexation was thus saved. Another advantage of taking the negatives of this size was its adaptation to the magic lantern. Some preferred the oxycalcium

light; but he used a mixture of equal measures of oxygen and common coal gas. It was a mistaken notion that it was a very expensive light: six gallons of this gas will burn an hour and a-half, and the cost, including the ball of lime, would be less than one shilling for that time. The Photogen was suggested; but the difficulty of condensing the light, and the necessity for a special apparatus, would be a great drawback to its adoption. The electric light would no doubt answer; but the cost overbalanced its advantage.

A MEMBER suggested the use of a reflector; but Mr. LEGG replied, that he had used one, and discarded it on account of its producing irregularity of light. He did not think the use of reflectors in magic lanterns advisable.

Mr. HANNAFORD then read a short paper "*On some Further Experiments in the Iron Printing Process*," (see p. 36) and produced some very good specimens. Some of the iron pictures were superior to silver prints from the same negative. The principal improvement he introduced was the substitution of albumen for gum-arabic in the sensitising solution.

After an animated discussion votes of thanks were passed to Messrs. Legg and Hannaford, and the meeting adjourned to Feb. 23rd, when the nomination of officers for the ensuing year will take place.

CHORLTON PHOTOGRAPHIC SOCIETY.

THE Monthly Meeting of the Chorlton Photographic Society was held at the Chorlton Town Hall, on Wednesday, the 12th ultimo, Mr. DEAN, the Vice-President in the chair.

Mr. NICHOLSON, in announcing to the Society the sudden death of Mr. Hepworth, the Treasurer and late Vice-President, gave a long and full account of his usefulness to the Society from its commencement, and concluded by moving—

"That this meeting having heard with sincere regret the intelligence of the sudden decease of the late Vice-President of the Association, Mr. Hepworth, desires to express its sympathy with his bereaved widow and family in the great affliction that has befallen them, and also to record not only its appreciation of those many sterling virtues which justly won for him the respect of his fellow members, but also to acknowledge the great services which he rendered to this Association as one of its founders, and the ability and courtesy which he displayed in the discharge of his duties as its first Vice-President, and that a copy of this resolution be sent by the Secretary to Mrs. Hepworth."

Mr. HEYWOOD briefly seconded the resolution.

The CHAIRMAN on rising to put the resolution was prevented by several members saying simultaneously, that it was not necessary; and it was accordingly considered as carried unanimously.

After a silence of some minutes duration,

Mr. ROGERSON stated, that he had intended to read a paper "*On the Enlargement of Positives*," but some apparatus which he intended to use in bringing his subject before the meeting was not ready, and he was obliged to postpone the matter until next meeting. He moved, and Mr. WARDLEY seconded, that Mr. Nicholson be appointed Treasurer, which was carried.

The CHAIRMAN said he thought he had discovered a method of colouring glass pictures which would stand the test of magnifying sufficiently for the magic lantern; he should be happy to try, if some member would furnish him with a picture. The meeting thought it would be a very satisfactory thing if it could be accomplished, and Mr. Wardley promised to provide a specimen for the Chairman to work upon, which he would show at the next meeting in a finished state.

An animated discussion on printing ensued, during which the alkaline chloride of gold, as described in a contemporary, was highly spoken of, and several members finding it economical they discarded the old plan.

A drawing and description of a circular moveable diaphragm for insertion between the two lenses in a portrait, combination which could be opened and closed to any required extent without moving the lenses, was exhibited by Mr. Hope.

Mr. HOOPER explained his mode of washing prints in many changes of water, without attention, by means of a syphon, which only commenced working every time the washing vessel was full.

Mr. WARDLEY mentioned that Mr. Young had produced a picture developed in daylight after fixing by hypo, which was curious; the meeting thought it was an instance of substances being acted upon by light in several ways, for instance, a coin placed on a plate of glass, and exposed to light after reversing for a considerable time, leaves an impression without any other agent being required, and it was thought that a plate of glass was sensitive to light, but not so much so as iodide of silver.

Mr. ROGERSON exhibited a very neat and compact dark slide for dry plates or paper made from millboard, which had been sent to him from the Macclesfield Photographic Society, and could be had for one shilling each.

A vote of thanks to the Chairman concluded the meeting.

Exhibitions.

PHOTOGRAPHIC SOCIETY'S SIXTH ANNUAL EXHIBITION.

WE intimated in our last the opening of this Exhibition, but the great press of other interesting matter precluded the possibility of then giving any thing like a detailed description of its contents. We now propose to make a few remarks upon it by way of criticism, for the purpose of keeping our readers acquainted with that which is going on in connection with our art.

On glancing through the catalogue, we are at once struck by the existence of a fact—a gradual tendency towards which we have before now remarked upon—we mean the increased *professional* character of the display, which has been of late more and more apparent. In the present case, more than nine-tenths of the whole assume the qualification above designated. This is, perhaps, not surprising, when we reflect that the amateur of yesterday is the professional operator of the present day: nor are we at all certain that the fact is one to be deplored; still we cannot but feel some little regret that amateur exhibitors do not now muster in greater force as regards numbers, even although the works contributed by each should be but few. Experience teaches us, that however much professional operators may be able, from constant practice, to excel as regards skill in manipulation, when compared with the generality of amateurs, it is nevertheless amongst the latter class, as a rule, that scientific discoveries, tending towards the improvement of the art itself take place. It would therefore be unwise, as well as unjust, towards those who labour purely for love and not for profit, to deny them a full share of the honours that are to be acquired by a due representation in each succeeding exposition. Not that we have aught on this head to charge against the hanging committee of the present exhibition; on the contrary we have before remarked, that the members of it have performed their duties with unusual success and discretion.

In our opinion there is one great advantage in the Suffolk Street Gallery not easily to be attained elsewhere—that is, a sufficiency of wall space to display the works without the aid of central screens, which take off so materially from the general effect as a whole, and materially interfere with the comfort of the visitor in examining the various productions. The three rooms *en suite* also admit of a very convenient mode of classification of the pictures, tending towards unity of design, without in the least producing the idea of disruption apt to be engendered by portions of a collection being located in different apartments. In a collection of photographs of all kinds, we have always found that stereoscopic subjects collected in one mass in a huge frame—portraits, coloured and uncoloured, and of widely different dimensions—invariably mar the general effect, producing what an artist will recognise by the term *spottiness* in a picture. Now by collecting these together, as is done at Suffolk Street, and arranging them in one of the smaller divisions; the remainder of the collection is freed from the damaging effect before spoken of; and these works themselves are considerably the gainers, being seen to much better advantage than when overshadowed by some huge giant; while at the same time they are not obnoxiously dissociated from their larger brethern, but have rather a post of distinction assigned to them.

The mode of nocturnal illumination adopted, viz., by gas external to the extensive skylight, is very conducive to the comfort of the visitors; but, as few advantages are attained without a corresponding outlay, we have in this instance also the penalty to pay, which we regret to admit is at the expense of a portion of the beauty of the photographs; for, as a rule, these are seen to better advantage the greater the amount of light that is allowed to fall on them, while the pleasant and mellow light produced by the arrangement described is better fitted to the display of paintings or drawings not produced by its agency. We heard the remark

made that it was a capital imitation of a London fog. If so, it must have been an external one; for certainly nothing of a haziness was perceptible within the building, though we felt inclined repeatedly to remark that we were "waiting for more light."

On taking a general survey, we do not find, as on some former occasions, a few subjects standing prominently out from amongst the general mass; but we believe this arises from a very satisfactory cause—we mean that the prominent ones are the few indifferent works that are included; for the generality reach a very high standard of excellence. Of course we took notes for the benefit of our readers; but we find, on going over the catalogue, we have marked so many pictures, that it would be an infliction to specify in detail one-half even of those signalised: we propose, therefore, in the present instance, to make our observations more general than particular.

Amongst the few amateurs exhibiting, we are much pleased to recognise again the handiwork of our old friend, Mr. Rosling, who is a pretty extensive contributor of works of a high order of merit, both by the collodio-albumen and by the ordinary humid collodion processes. We cite Nos. 91 and 599—each frame containing four subjects—as well worthy of careful inspection.

Mr. B. B. Turner has this year a series of architectural subjects, chiefly from Canterbury, taken by the Talbotype process, which is well adapted to render them in a bold and effective manner. Specimens will be found numbered 207 to 211, and 277 to 279, and are of such generally equal merit that it is hard to select one in preference; perhaps, however, that last indicated is entitled to the most honourable mention.

To Mr. F. Maxwell Lyte we are indebted for the display of some very fine and interesting landscape subjects, with natural clouds, of which the most effective are No. 636, *Le Pont de Scia*, and 637, *Saint Sauveur*. Nos. 629, *Bagnerres da Bigorres*, and 630, *St. Béat*, are also very fine.

Of the collection of Messrs. Caldesi and Montecchi's copies of the Cartoons of Raphael, enough has already been said in *The Times* and other daily papers. Their value is greater amongst professional artists and the general public than with photographers, who like to be something more than mere copyists. We have never regarded this branch of the photographer's occupation as one standing in more than a secondary position—very useful, very important in its way, but not tending, in our opinion, to the elevation or progress of photography proper: and we have the hardihood to give expression to this conviction, notwithstanding the risk we run of incurring displeasure for presuming to differ from so great an authority as "the Thunderer."

Mr. Fenton comes out in great force; and we are pleased to notice that he is turning his attention to a department of the "art" in which he is less known than in his exquisite landscapes—we mean those subjects that in *art-slang* are generally designated as *genre* subjects. Of these, No. 43, *The Pasha and Bayadère*—No. 50, *The Reverie*—No. 606, *Turkish Musicians and Dancing Girl*—No. 608, *Nubian Water Carrier*, are favourable examples, being admirable illustrations of Eastern scenes of actual life. Their execution, also, is worthy of Mr. Fenton's well-known fame.——Amongst this gentleman's landscapes there are so many that we covet, that we feel almost inclined to mention the whole of them; but Nos. 34, *Glastonbury Abbey*, and 54, *Raglan Castle*, are especially fine; as also No. 55, *The Central Valley, Cheddar Cliffs*, which has an indescribable charm, the atmospheric effects being truly wonderful. The *South Aisle of Salisbury Cathedral* (No. 63) is a good specimen of the delineation of a difficult subject—an interior; but one of the most interesting as a photograph is No. 69, *Chatsworth: Cattle in the River*,—a perfect Cuyp in its way. In this, we need scarcely say, there is no stiff attitudinising, but life, vivid life, in all its natural grace. Here is a direction in which photography is truly invaluable to the artist: it offers the means of catching truly the "poetry of motion." Photography has dispelled the illusion of the old conventional way of rendering the horse at full gallop, having all four legs radiating from the trunk as from a centre—an attitude never in reality assumed by this animal, except perhaps momentarily in the act of leaping; for when the fore-legs are thrown out, the hind ones are doubled up under the belly, and *vice versâ*.

Mr. Bedford's architectural subjects always impress us with the idea of their having been executed by Mr. Fenton's *younger brother*, so similar are they in style—that is, as similar as a portrait and a minature can be. We do not mean, however, that Mr. Bedford is the least bit of a plagiarist—far from it: he has a style as unmistakeably his own as ever artist had; but, in the particular class of subject named, Mr. Fenton's and Mr. Bedford's ideas seem to run in parallel lines. *Raglan Castle* and *Tintern Abbey*, in all their numerous phases, as shown by Mr. Bedford, are our especial favourites amongst this gentleman's large contribution to the collection, particularly those numbered 88, 99, 118, 130, 137, 139, 143, 145, 149, in which the effect of solidity is something marvellous—they are gems of the first water.

While amongst the architectural pieces, we must not omit to direct attention to No. 178, four subjects at Rouen, by the late Mr. R. Howlett, in whose decease photographers have been deprived of a most skilful and energetic follower of the art. The exquisite delicacy and fidelity of representation of the beautiful sculpture-adorned buildings, as exhibited in this frame, possess a charm that is only to be felt by the spectator; no description can do justice to them. No. 158 contains four views of *St. Ouen*, and the *Cathedral at Rouen*, equally fine in execution; and besides several others are some microscopic studies, No. 519, by the same lamented brother of our craft.

If the art of photography be yet old enough to possess a veteran amongst its votaries, we suppose we may regard Mr. P. H. Delamotte as one of them; but then a photographic veteran does not necessarily indicate an old man. This gentleman exhibits only one picture; but that one contains as much as a dozen ordinary ones, being a magnificent *Interior of the Crystal Palace at Sydenham*, occupying three large sheets of paper, but of a tone so even and so cleverly joined, that only the initiated are able to detect the fact. The most difficult point of attainment in these panoramic views is, not so much the junction of the component lines, as the production of negatives of equal intensity, allowing proofs of the same tone to be printed from the whole of them.

We come naturally next to consider Mr. Frank Frith's still more extensive *Panoramic View of Cairo* (No. 553), consisting of no less than seven large sheets united together. This work we have recently noticed in our review of the Architectural Photographic Exhibition, as well as many of Mr. Frith's other works. We understand that the view of Cairo is intended as a present to the Pasha of Egypt, as some acknowledgment of his kind assistance to Messrs. Frith and Wenham, when engaged in procuring the negatives in the dominions of that potentate.

To those who accuse the collodio-albumen process of being hard and deficient in half-tone, in addition to Mr. Rosling's, we would point to some of Mr. W. Sykes Ward's pictures, as showing that this alleged failing is not *necessarily* the case. More particularly we allude to the upper left-hand picture in frame No. 400.

There is a very charming landscape by Silvy (No. 573), that we should much like to gain some more information about: the effect is very fine, yet not altogether satisfactory—the sky, evidently a natural one, being far too dark for the rest of the subject. We cannot quite make out whether it has been printed from a different negative to the rest of the picture, or from the same: there appear reasons for arriving at either conclusion.

Mr. J. H. Morgan is a photographer quite after our own heart. We should feel tempted, but that we have not his acquaintance, to imagine that he had selected his subjects for our own especial delectation, so completely are they the style that we particularly delight in, and choose when we have the chance. No. 601, *The Nightingale's Haunt*, and No. 614, *The Early Violet's Home*, are enough to make one wish to be *alternately* a bird and a flower. Nos. 612 and 613 are also very beautiful; but we must pause, or our list will look like a table of logarithms.

There are three or four instantaneous pictures, not very striking; but the best is, perhaps, No. 148, *Waves*, by Messrs. Cundall and Downes, which are not merely stereoscopic-sized pictures, but about 8 × 6 inches in dimensions.

Two fine foreground studies—No. 134, *Tussilago*, and No. 146, *Ferns*—by Messrs. Ross and Thomson, are, doubtless, identical with those recently noticed by our Edinburgh correspondent.

We are glad to find that Mr. Rejlander has not deserted us. We always regard his productions with interest, even when they do not happen to be precisely to our taste, because he always works with a purpose. No. 154, *Well!* is very graphic. An old schoolmaster is hearing a scholar, in the garb of a blue-coat boy, say his lesson, in which the latter is evidently not sufficiently "well up;" whilst a friend in need, in the guise of a schoolfellow, is "helping the lame dog over the stile," by aid of what, in our younger days, we used to designate a "crib." *The Scripture Reader* (No. 183) has been before noticed in our columns, as well as several others of this gentleman's works.

Mr. H. P. Robinson also exhibits several that we have before had the pleasure of introducing to our readers—amongst them *Fading Away* (No. 18), and the *Little Red Riding Hood* series (Nos. 13 and 22), which last, by the way, should have been reversed in

their order — a circumstance which gives rise to grave doubts in our mind, whether the hanging committee were well versed in that veritable history. No. 8, *Lulu*, is a charming picture of a charming model. No. 27, *Mariana*, from Tennyson's poem —

> An image seemed to pass the door,
> To look at her with slight, and say —
> " But now thy beauty fades away,
> So be alone for evermore."

The figure is well *posêd*, and the gleam of light on the eyeball (not on the iris) is something striking in its effects. The same model appears in 564, *She never told her Love*, &c., and seems to be able to assume and retain certain expressions of feature in a wonderfully clever manner.

There are some clever subjects by Messrs. Truefit Brothers. No. 10, *Granny's Lesson* — an old woman crouching beside a wooden fence and teaching her little grandchild her letters — forms a very picturesque group. No. 35, *The Rejected*, is also good, and so is No. 70, *Listeners seldom hear good of themselves* — in all, the models not exactly ranking amongst the " upper ten thousand."

Messrs. Delferier and Beer have some pictures which indicate considerable powers of composition in a peculiar style; but there is a slight want of *reality* in the result, and the accessories are rather too crowded. No. 83, two subjects in one frame, called *One Wink* and *Forty Winks*, are however exceedingly good. An old Dutchman appears with a grin and a wink of satisfaction, pouring out of a corpulent-looking bottle, for his private refreshment, no niggardly dose of veritable Schiedam: the companion picture exhibits our hero enjoying his " forty winks," the probable consequence of the previous solitary one.

Amongst the portrait photographers appears a new star, in the person of Mr. Chloponin — we believe a Russian — whose productions are well worthy of critical examination — Nos. 352 and 338 in particular. The former is a lady in a white ball dress, which not only appears beautifully transparent and perfect in detail, but the figure is artistically illumined, and stands out from the background more than any portrait we have ever before seen.

Mr. Williams is still at the head of the English portrait photographers, and exhibits amongst others an excellent likeness of our friend, Mr. Hardwich, whose features will doubtless be scanned with interest by many who know him well by his deeds, though not personally.

Dr. Diamond gives some forcible reminders of well-known faces.

Herr Pretsch exhibits some fine specimens by his photogalvanographic process.

Mr. Burnett has some examples of his uranium, iron, and copper printing. Nos. 384 and 392 are the same as he exhibited some years back at the meeting of the British Association; but they are of present interest, in consequence of his valuable paper recently published in our *Journal* and elsewhere.

We must bring our notice to a conclusion for fear of tiring our readers. We cannot, however, but feel, that long as we have been obliged to make it, we have not half exhausted the many interesting matters for discussion presented to us.

NOTTINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The first Exhibition of this Society was opened at the Exchange Rooms with much *eclat*, on the evening of the 7th ult. The *conversazione* was attended by nearly four hundred of the principal families of the town and neigbourhood. A band of music and refreshments were provided, and the arrangements gave general satisfaction. The works exhibited are the productions of many of the most eminent photographers, both English and continental, amongst which the specimens contributed by the members of the Nottingham Photographic Society are conspicuous. We noticed the fine landscapes of Mr. Roger Fenton; the architectural views of MacPherson and Bisson *frères*; the portraits by Maull and Polyblank; the *tableaux* of Lake Price, Robinson, and Rejlander; the studies, by Mr. Thurston Thompson; the sea-scapes of Le Gray; and the illustrations of astro-photography, by the Padre Secchi, by Nasmyth, and Sidebotham. Mr. Frith's views in Egypt and Palestine are also very conspicuous. There are two views at Rouen, taken by the late Mr. Robert Howlett, with the *Petzval* lens, which possess a melancholy interest from the premature decease of this excellent artist. Of local contributions among the most noticeable are the works of the Rev. J. J. Dredge, of J. F. Hurley, Mr. Woodward, J. Bourne, Dr. Goode, of Derby, Miss Hurst, of Alderwasley, Mr. Nowall, Mr. Cotesworth, Archibald Briggs, the Rev. J. Holden, Alfred Rosling, and Mr. Smith. The prize pictures are *West Door, Southwell Minster*, by the Rev. J. J. Dredge; *Newark Castle*, by J. F. Hurley; and *Cottages at Wilford*, a stereograph, by Mr. Woodward; copies of these are presented to subscribers. Mr. Rosling has presented four fine landscapes, and Mr. Sidebotham, of Manchester, has also presented three landscapes. Mr. H. P. Robinson, of Leamington, has presented a copy of his popular picture, *Fading Away*.

In the room appropriated to apparatus, chemicals, &c., Mr. Atkinson, of Liverpool, exhibits a lens, said to be the largest in England, and a solar camera. There is also exhibited a goodly array of cameras, tripod stands, tents, dark boxes, stereoscopes, and stereographs, contributed by Messrs. Ottewill, Thompson, Horne and Thornthwaite, Woodward and Shepperley. Dr. Hill Norris contributes some very fine stereographs on glass.

The exhibition has been well attended, and altogether is very creditable to the energy, industry, and skill of the gentlemen who organised it. A great impulse cannot fail to be given through its means to the art of photography in Nottingham and its vicinity; and we shall not be surprised to see other provincial towns profiting by the example.

Processes.

IRON PRINTING PROCESS.

By Michael Hannaford.

(Read before the North London Photographic Association, 27th Jan., 1859.)

Since our last meeting I have substituted albumen for gum-arabic in the sensitising solution with considerable advantage. I beat up, in the usual manner, albumen one part, water two parts — or equal parts of each, if a high glaze is desired — together with —

Bichromate of potassa, to saturation;
Ammonio-citrate of iron, 10 to 15 grains to the oz. for under-exposed negatives with strong contrasts; 15 to 20 grains to the oz. for good negatives; and 20 to 30 grains to the oz. for over-exposed weak negatives.

I make, also, the following solutions: —

1. Liq. ammonia, about 1 oz.; water, 1 pint.
2. Chloride of gold, 1 grain; water, 4 ozs.
3. A saturated solution of gallic acid (or a hot solution, containing from 2 to 4 grains to the ounce, can be made as required for use).

I use the thick French papers albumenised. To sensitise the paper, float it for two or three minutes, and hang it by one corner to dry. If the albumen has not been well beaten up, the paper will not be evenly coated.

After exposure under a negative, the print must be immersed in water for from half-an-hour to, comparatively speaking, any length of time. Most of the specimens exhibited were immersed from one to four hours. One has been soaked *for more than a week*, without the slightest difference in the result, so far as I can see.

Now transfer the picture to a bath of the ammonia solution, in which it should be allowed to remain for about five minutes. This will clear the whites. Then put it into the gold toning bath for from five to ten minutes, first giving it a rinse in clean water.

The picture is now ready for developing, which is effected by placing it on a clean glass plate, and pouring on the gallic acid solution. In case of over-exposure, the details will not come out readily, but sufficient of the ammonia solution to cover the paper, poured on at one end, and allowed to escape into the waste pan, will have almost a magical effect.

I usually finish by laying the picture on a flat dish, and pouring boiling water over it.

[Mr. Hannaford has emphatically expressed his obligations to the writings of Mr. Burnett on this subject — the former is working out, in a manageable form for those not possessed of Mr. Burnett's chemical abilities, the principles enunciated by the latter. — Ed.]

QUICK Versus SLOW PROCESSES: THEIR COMPARATIVE MERITS.

By F. B. Gage.

It has been a great desideratum among artists to procure some process whereby pictures may be taken in the twinkling of an eye, and therefore we see almost every artist running semi-crazy after any new nostrum that is proposed to take impressions in a moment. These processes are all advertised by their respective discoverers and proprietors, as producing a little better result

than any other method heretofore known. I recollect purchasing a quick process several years ago; it proved to be all that it was recommended in regard to quickness, for it was quick in every sense of the word. It took just a fraction less than no time to take an impression, and the impression generally proved to be just a fraction worse than none. The pictures were sure to be too white, or too flat, or too yellow, or too any thing but just right: and I soon threw the stuff away and returned to a reasonably slow process. Not long after I met a quick process in some journal, which was said to be just the thing and "dead sure;" so I resolved to try it again. I prepared the chemicals and at it I went, fully prepared to conquer the baby chemicals as well as others. My patience held out remarkably well on this process. For two weeks I persevered, fully resolved to conquer, but at last endurance could hold out no longer. Such burlesques of the "human face divine" were horrible! I pitched the stuff out of window, and delivered myself in this wise—"Go to thun——!" (that is a dreadful noisy word, Mr. Editor, therefore I will not repeat it, for I am not commonly called a profane man).

When the ambrotype process first came out it was stated to be a great deal quicker process than the daguerrotype. This was good news, and all the babies in town laid awake every night for three weeks and practised crowing, that they might have their pictures taken in that interesting exercise, by this new wonderfully sensitive process. When, however, the matter came to be tested, it was found that—like the daguerreotype—the quicker the process the more uncertain the result. It was found that the ambrotype had but little advantage, except that the developing could be pushed and a half-exposed impression rendered saleable with any amount of distorted lights and shades. A very sensitive surface, with a strong light, would either fog or flatten, or some mischief was sure to follow, so that a gem was the exception and not the rule; while with a slow process, the gems were the rule, and the inferior impressions the exception. And there is a reason for this—an insurmountable law of nature. Any compound that is very sensitive to light is equally sensitive to atmospheric and other changes, while the surface that is slow to receive the impression of light is equally slow to change from other causes. All quick processes are, from their very nature, unstable and are not to be trusted. There is, however, a point beyond which a process is found to be too slow to produce good results. Therefore a medium between the extremes seems best. With a moderately strong light, from 25 to 60 seconds will usually warrant the best results in a daguerreotype. With the ambrotype, from 25 to 50 seconds, and from 30 to 75 for a negative portrait. With a good light (100 square feet of skylight) and chemicals to work at about these rates, I have been able to produce results that were uniform, and those that were not compelled to go begging either for praise or patronage. Hence, when asked my opinion about the merits of any new quick process, my answer is usually found in the old adage—"*Slow but sure.*"—*Humphrey's Journal.*

Letters to a Young Photographer.

No. III.

My Dear Eusebius,

If you wish to become an accomplished photographer, you must above all things practice patience. Do you think such a noble art can be learned in a day, or taught, like writing, in six lessons? If you practice it all your life, you will be but serving your apprenticeship to it. As the poet wisely said, "Art is long and life is fleeting!" and you must win your laurels by persevering study and exclusive devotion to your idol. I would not discourage you with magnifying difficulties; but, as I know you would not be satisfied to remain a bungler in our art, I am desirous that your progress should be slow and sure. Why, it takes seven long years to make a carpenter or a shoemaker; and is not the photographer as great a craftsman as either, and can you expect he will be turned out complete in as little time as it takes to make a pair of shoes? Patience, then, my dear Eusebius, and you shall have your reward. Everything will come at the proper time and in the proper place. If I told you everything at once you would forget half and misunderstand the rest.

Somebody has told you that five per cent. of hydrochlorate of ammonia is not enough! Well then, I can tell you beforehand what will happen if you double that quantity. When you come to float this strongly salted paper upon the silver solution, chloride of silver will be formed in such quantity, that it will be precipitated instead of forming a thin layer on your paper, which will present a mottled appearance when it is exposed to the light, and spoil any pictures taken on it. Besides, the more chloride of ammonium you employ than is necessary, the more nitrate of silver is decomposed, and the surplus is waste, and the toning and fixing are rendered more difficult. You will find, I am sure, that a weak solution of chloride of ammonium is better for your purpose than a strong one, provided you do not go into the opposite extreme.

But your salting solution may become too strong, if you do not take into consideration that when exposed in a broad, shallow vessel it evaporates, and becoming more concentrated will produce the effects I have pointed out, if you do not take measures to obviate them, by adding each day, when you return the salting solution to the stock bottle, half an ounce of water to the pint. In a warm room or during summer weather evaporation goes on very rapidly, and must be taken into account. With these precautions you may now venture to proceed to sensitising the salted paper on the bath of nitrate of silver. Make a solution by adding one ounce of nitrate of silver to eight ounces of distilled water, filter, and keep it in a black bottle. Pour a sufficient quantity of the solution of silver, of the strength indicated, into a flat, shallow, porcelain or glass dish, and float the paper on it in the same manner as for salting, carefully avoiding bubbles, or wetting the back of the paper with the silver solution. You understand, I hope, that it is the salted and albumenised surface of the paper that must lie on the silver solution, and it may remain floating for about five minutes; then lift it up gently by one corner, and let it drain into the dish; when the silver solution ceases to drop freely, hang it up by a black pin, and attach a piece of blotting paper to the lower corner of the sheet of paper. Every sheet of salted paper floated upon the silver solution, besides abstracting a certain quantity, reduces the original strength of what remains. It is a good plan to frequently replenish the bath from a stock bottle of solution of greater strength—say one ounce of silver to seven ounces of water—so as to keep up the normal strength of the bath.

I cannot insist too strongly upon the necessity for perfect cleanliness in this operation: the dish into which the silver solution is poured must be carefully wiped out with a clean cloth; the room must be free from dust, and the hands from other chemicals employed in the various operations. Sometimes a thin pellicle or scum forms on the surface of the solution, caused by the reduction of the silver by particles of dust, &c. settling upon it. This may easily be removed by collecting it in one place by means of a slip of writing paper, and removing it out on one side of the dish. If this scum adheres to the surface of the paper, the proof will be stained.

The room in which this operation is carried on must be lighted with a small taper, or what is better, by daylight passing through one or two panes of orange-coloured glass. On no account must gas be burned in the room; for during its combustion, sulphurous gases are given off, which attack the silver paper while wet, and form on it a multitude of black spots of sulphide of silver.

It is best not to silver more paper than you are likely to use in a day; for in the course of a few hours after the paper is silvered, it begins to turn brown, and the proofs acquire a dull, heavy hue, which no subsequent operations, at present known, are sufficient to remove.

There are some persons who will advise you to add acetic acid to your silver solution, but pay no heed to such evil counsel; the effect of acid in the paper is to cause spots to appear in the proofs when they are submitted to the fixing solution. The solution should be neither acid or alkaline, but neutral to test-paper; and if the bath becomes slightly alkaline from contact with the chlorinated paper, the ammonia will evaporate from the paper in drying, and leave it neutral. The effect of alkalinity is to retard the action of the light, and render the printing process very slow and tedious.

In the course of time you will find the silver solution acquire a deep crimson-red colour, owing to the action of the albumen on the silver. This is not productive of any mischief, provided it does not leave a permanent stain on the paper. You will filter the solution through paper, at night, when returning it to the stock bottle, adding to every pint of the solution five to ten drops of a solution of common salt, of the strength of twenty grains to the ounce of water, agitating the whole immediately, and letting it settle; if, in the course of an hour or so, it does not become limpid, add a few drops more. This is a much better plan than clearing by kaolin, pipe-clay, or fuller's earth. Half a drachm of the solution of salt contains about one grain of salt, which will precipitate about three grains of chloride of silver; this need not be wasted, but may be added to the residues.

The paper, when dried, is ready for the printing frame. It should not be allowed to hang in the air any longer than is necessary to become dry, as sulphurous emanations everywhere abound, and are sure to cause spots in the paper.

With this I send you half a dozen negatives to try your hand upon; they are picked to show you the various results of different modes of exposure, developing, &c. By carefully studying the positives in conjunction with the negatives, you will soon be able to judge in what a good negative consists. Some of these negatives are very dense, owing to excessive development: they will require very long exposure in the printing-frame. Others are thin, and will print very quickly: the true medium will, on comparison, be very evident to you.

There is another mode of positive printing, known as "printing by development," which I think it unnecessary to speak of at the present time, as in your stage of initiation it would serve no other purpose than to confuse you. One thing at a time must be your maxim. By the time you have got proofs printed from these negatives, I shall have sent you some information as to the best methods of toning and fixing.

Photographic Glossary.

Catalysotype — A process in photography invented by Dr. Woods, which depends upon a *catalytic* action set up by the salt of silver, which is afterwards continued by the salts of iron. The pictures obtained are negatives on paper. "It is said to have all the beauty and quickness of the calotype without its trouble, and very little of its uncertainty."

Centigrade Scale — The scale usually attached to thermometers in France and other continental countries, in which the space between the freezing and boiling points of water is divided into 100 degrees.

Centimetre — The hundredth part of a *metre*, or of 39·7 inches: it measures 0·393 inches or two-fifths of an inch nearly.

Cereoline or Cerin — A principle obtained from bees' wax by the action of boiling alcohol. It is employed in the waxed-paper process as a substitute for bees' wax.

Chlorides — Combinations of the bases with the gaseous element chlorine. The chlorides are used for salting paper in positive printing processes.

Chloride of Gold — A compound of one equivalent of gold united to three equivalents of chlorine, forming a solid reddish-orange salt, soluble in water, alcohol, and æther. It is very deliquescent, and must be preserved in sealed bottles. It is an agent in toning positive proofs, and forms the *fixing* agent for daguerreotype plates.

Chloro-bromides — Compounds of chlorine and bromine used for *accelerating* in the daguerreotype process.

Chloroform — A heavy, limpid fluid obtained by distilling alcohol or wood spirit with chlorinated lime. It is soluble in ether and alcohol, but insoluble in water. It is a solvent of gutta-percha, wax, the resins, caoutchouc, and camphor.

Chloride of Silver — One of the principal agents in photography, particularly in positive printing. It is composed of chlorine combined with silver, and is formed whenever a soluble chloride is added to a soluble salt of silver, such as nitrate. Chloride of silver is soluble in ammonia and in the alkaline chlorides, bromides, iodides, cyanides, and hyposulphites, but is quite insoluble in water and in the acids. When pure, ordinary chloride of silver darkens rapidly in the light. Dr. Percy recently demonstrated, that if produced by the direct union of chlorine and silver in a minute state of division, no blackening by the action of light follows. There is a sub-chloride of silver which has been the object of many interesting experiments in obtaining colours in photographic pictures.

Chloride of Platinum — More correctly bichloride, as it is a combination of two equivalents of chlorine and one of platinum. It has been substituted as chloride of gold as a toning agent in positive printing.

Chloride of Sodium — Familiarly known as culinary salt. It is a compound of chlorine and sodium. It is employed in photography for "salting" paper in positive printing, but is not so good for that purpose as chloride of ammonium.

Chlorine — An elementary gaseous body of a greenish yellow colour and strong irritating smell. It is soluble in water, to which it imparts its properties, and exercises a very energetic bleaching action upon vegetable bodies. In combination with the various bases it forms *chlorides.*

Chromate of Silver — A crimson-red salt, consisting of chromic acid and oxide of silver. It is decomposed by light in the presence of organic matter.

Chromic Acid — A per-oxide of the metal chromium, which, in combination with the bases, forms salts, termed chromates. As a photographic agent it possesses much interest and value.

Chromates — Combinations of chromic acid with various bases. The principal chromates used in photography are bichromates of potass and chromate of silver.

Chromatype — A photographic process invented by Mr. Robert Hunt, based upon the action of bichromate of potash upon sulphate of copper, the picture being developed by nitrate of silver or of mercury.

Chrysotype — An ingenious photographic process invented by Sir John Herschel, dependent upon the reaction between chloride of gold and ammonio-citrate of iron.

Citrates — Combinations of citric acid with various bases. The principal photographic citrates are those of soda, silver, and mercury.

Citric Acid — The acid of lemons and other fruits. It is readily soluble in water and in alcohol. It is used in photography in conjunction with pyrogallic acid as a developing agent for collodion negatives, in which it sometimes advantageously supersedes acetic acid.

Collodion — A solution of gun cotton in æther, introduced into photography by the late F. Scott Archer. The collodion, when iodized, is poured upon a glass plate, and the æther evaporating leaves a thin transparent film, of uniform and tenacious quality. Collodion is an inert substance, the part it performs in photographic operations is like that of albumen or paper; it is a support or vehicle for the sensitive salts of silver.

Cyanide of Potassium — A compound of cyanogen and the metal potassium. It is made for commercial purposes (mixed with a portion of cyanate of potash) by mixing eight parts of perfectly dry ferro-cyanide of potassium with three parts of carbonate of potash, and keeping the mixture at a red heat until all the gases are evolved. This salt is largely used in photography, particularly in the positive collodion processes for dissolving out the iodide of silver, removing stains from the fingers, &c. It is highly poisonous.

Cyanide of Silver — A salt composed of cyanogen and silver. It is white, insoluble in water, but soluble in cyanide of potassium. Being easily acted upon by light, it is applicable to photographic purposes.

Cyanogen — A gas composed of carbon and nitrogen, which, in most cases, acts like an elementary body, such as chlorine, bromine, or iodine. The combination of cyanogen with basic bodies are *cyanides,* some of which are used in photography.

Cyanotype — A photographic process invented by Sir John Herschel. Ferrid-cyanide of potassium is the agent employed: when acted upon by light it is converted by it into "Prussian blue;" it is fixed by washing in carbonate of soda. Another method is to submit ammonio-citrate of iron to the action of light, and then develope the picture with ferrocyanide of potassum.

Foreign Correspondence.

Paris, January 25, 1859.

Under the favour of bright skies with increasing actinic power, our photographic artists are busying themselves in preparing their choicest productions for the forthcoming exhibition. Having lain fallow for a year, we may look for a rich and vigorous crop of sun pictures, which shall, doubtless, eclipse all former displays. From what I see and hear, a "toning" fever has set in lately, and, like "dry collodion," threatens to become epidemic. About a year ago, M. Gustave Le Gray, so well known by his very choice pro-

ductions, deposited with the *Académie des Sciences* a sealed packet, containing a new method of toning with chloride of gold. At the last meeting of the *Académie* this packet was opened and read; but previously the author had communicated to M. Regnault some modifications in his formula, which is of sufficient interest to command the notice of photographers generally. He first washes the proofs, upon removal from the printing frames, in two changes of water, to remove the free nitrate of silver from the pores of the paper. The proofs are then immersed in a bath composed as follows:—Distilled water 1000 *grammes* (35½ ounces), chloride of lime three *grammes* (46 grains); filter and then add—chloride of gold one *gramme* (15 grains), dissolved in 100 *grammes* (3½ ounces) of distilled water.

In this bath the proofs acquire a black tone, which tends to become more and more *bluish*, while the *whites* acquire great purity and brilliancy. The maximum effect is produced in about ten or fifteen minutes, according to the colour desired. An immersion of one minute in this bath will give violet-red tones after fixing in hypo, while deep blue-black tones require an immersion of one or two hours. During this interval of time the proofs pass through all the intermediate tones until the shadows are quite black; after which they become blue, and lose their beauty, it being understood that these remarks apply to the appearance of the proofs after they have been fixed in hypo. There is, therefore, an ascending and a descending period of toning, which must be carefully watched. After removal from the gold bath, the proofs must be quickly washed in two changes of water, to remove the chloride of lime, and next immersed in a solution of one part of hyposulphite of soda in six parts of water. The chloride of silver is dissolved out in ten or fifteen minutes, according to the temperature. The proofs lose a little of their blue-black tone, and become more violet. If satisfactory tones are obtained, the proofs may now be washed in the usual manner; but to secure the greatest chance of permanency, it is advisable to immerse the proofs in another bath, composed of distilled water forty-two ounces, hyposulphite of soda seven ounces, chloride of gold thirty grains. The proofs must remain in this bath at least fifteen minutes, but they may be left in it longer, if the desired tone is not then obtained. Washing in warm water is more effectual than in cold.

You doubtless heard, last summer, of the wonderful box invented by Mr. Cognacq, of Rochelle, for preserving sensitised positive paper for an indefinite time, without its becoming discoloured. They were sold at a big price—60 and 80 francs; but as they appeared to answer the purpose for which they were designed most effectually, they set the curious philosophers to work to discover in what their principle of construction consisted; and as there can be no secrets long kept in photography, this one has leaked out. Messrs. Davanne and Girard, whose researches in positive printing are so interesting and valuable, investigated the principle upon which such boxes are constructed, and they have found that nothing more is necessary than to make them air tight. Sensitised paper put when quite dry into such a box, instead of into a portfolio, will preserve its colour and sensitiveness for a time at present undetermined, but which certainly exceeds a month. Now this is a real boon to photographers, and I hope will be acknowledged without cavilling. A stock of sensitive paper can be prepared in dull weather and kept ready for use without the slightest deterioration. At the last meeting of our Society, M. Quinet exhibited a series of positive proofs, obtained by means of a paper prepared in a particular manner, and which possesses the property of keeping its properties during many months without alteration, either before or after exposure in the printing frame. The fixing is performed as quickly as usual, and the proofs are quite permanent. M. Quinet keeps this process a secret, but doubtless some of your readers will soon ferret it out.

The regulations and conditions of the forthcoming Photographic Exhibition are just announced. It will be open from the 1st of April to the 15th of June. Works intended for exhibition will be received *only* from the 1st to the 15th of March, and must have the name and address of the artist affixed, accompanied by a letter containing a list and description of the works sent. The process by which the pictures are taken must also be specified. Coloured photographs, and all such as are *touched* so as to modify the photographic result by substituting a mechanical process, will be excluded. The prices of works for sale may be communicated to the Secretary, M. Martin Laurelie, but they will not be allowed to be attached to the frames of the pictures. Works rejected by the Committee must be removed within ten days after notice of the rejection is given to the exhibitor; and exhibited works must be removed from the Exhibition within eight days after it is closed.

The process of photolithography, by Messrs. Cutting and Bradford, of Boston, lately patented in London by Mr. Newton, appears quite analogous to that communicated two years ago to our Photographic Society by Messrs. Rousseau and Mussor. When I saw that this communication came from America, I had my doubts of its real origin there, and my doubts are well confirmed.

J. P.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, George Shadbolt, 2, *Upper Hornsey Rise, London, N. All* Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

Correspondence.

ON THE THEORY OF DRY COLLODION PROCESSES.

To the Editor.

Sir,—On perceiving in your *Journal* of the 15th instant a communication by Dr. Hill Norris, "On the Theory of Dry Collodion Processes," I found myself very speedily cutting the leaves to ascertain what his views were upon that subject. Dr. Norris's remarks upon previous occasions have been so clear and judicious, that I have more than once had it in my mind, as a member of the Photographic Society, to request the republication of his papers in the Journal of that body. I confess, however, that on this occasion I am a little disappointed, and am inclined to enter upon a friendly controversy with him, if it should appear to you that the subject will gain by a free discussion. To pass therefore at once to the point at issue, I may observe, that as our knowledge increases, and fresh facts are brought to light, it becomes, to my mind, more and more evident, that the essence of all dry processes lies in affinities existing between the sensitive surface of iodide of silver and certain forms of organic matter combined with nitrate of silver. *Porosity* of collodion may be favourable to penetration by the developer and quick developement—of that I have no doubt; but mere porosity is not, as I suppose, sufficient to establish the conditions necessary for a dry process. I have prepared a collodion very pure and quite porous, but was unable to obtain a picture with it until it had been kept for a time after iodising. Did the keeping render it more open in structure? It may have done so to a slight extent; but it is more reasonable to refer the improvement to the separation from the iodide of a portion of its base, potash or ammonia, and to the decomposition produced in the collodion by the liberated base, which would have the effect of forming a trace of an organic compound of silver in passing the film through the bath.

A short paper has lately appeared by Mr. F. G. Eliot, in which he states, that if you precipitate citrate of silver in a bath containing iodide of silver in solution, the iodide is carried down with the citrate. This evidently shows an affinity between the two above-named salts; and there are many reasons for thinking that a similar affinity exists between chloride or iodide of silver and other organic compounds. It may be proved to be so, for instance, in the case of *glycyrrhizine*; for whatever quantity of iodide of silver a nitrate bath of a given strength is capable of dissolving, it will take up a larger quantity when previously saturated with this resin-sugar.

The above experiments bear closely upon the question at issue, and show that we cannot correctly represent a washed collodion film of iodide of silver by the formula $Ag\,I$, unless we are quite sure that both the film and the bath are absolutely free from organic decomposition. If a change has taken place in either, then the film becomes $Ag\,I + Ag\,O\,(C\,H\,O)$, taking $C\,H\,O$ to represent the organic matter, and not necessarily supposing that the two constituents above expressed are present in equivalents, or that their relation to each other is definite and constant.

Pure pyroxyline appears to be neutral with regard to salts of silver; but is pure pyroxyline ever used in the dry processes? My experience goes to show that the more carefully you make the collodion the worse the result. Select a sample prepared from old linen at high temperatures, and you may perhaps get a picture almost immediately after iodising; but such pyroxyline cannot be esteemed to be either pure or neutral in its affinities; and we are not able to assert, that after passing through the bath, and subsequent washing, it is free from all traces of nitrate of silver, or that the iodide of silver rests *mechanically* upon it. On the other hand, it is almost certain that there is a loose chemical union between the

iodide of silver (or a portion of it) and pyroxyline of this description; for it has been observed that the *colour* of the film on decomposed collodion is frequently changed from yellow to opalescent blue, just as it would be if you added glycyrrhizine, or dissolved the iodide in *albumen* in place of collodion? This *blueness of film*, when it happens, is conjectured to depend upon an association of the iodide of silver with small quantities of an organic compound of silver.

But there are other kinds of pyroxyline which are comparatively stable, and consequently, as I suppose, less fitted for a purely dry process. How do we proceed in such a case? Either by bringing about decomposition with liquor ammoniæ added to the plain collodion, or by keeping the collodion for a time after iodising with an alkaline iodide. In either case a trace of alkali combines with organic elements of the pyroxyline and forms an organic salt of silver when the film enters the bath. The iodide retains these traces, and no amount of washing will leave the film in a condition to be represented by Ag I.

I do not however assert, that the presence of organic matter in the film will invariably secure success in a dry process, but simply, that such a process will not succeed if organic matter be absent; and further, that a communication professing to treat of the theory of dry processes in general cannot be esteemed complete without some allusion to this subject. The views which I have stated are not hypothetical, but are based upon experiments which I shall be happy to bring forward if required. I may perhaps be mistaken in supposing that Dr. Norris takes a purely mechanical view of the whole question, but if such be the case, I feel convinced that it will eventually be shown that he is in error.—I am, yours, &c.

F. HARDWICH.

King's College, January 19, 1859.

ALLEGED IMITATION OF THE PETZVAL LENS.

To the Editor.

Sir,—The smallest lens that I have at present for taking portraits is a ¼ plate one; but as some friends wanted smaller pictures than I could take with it, I thought that were I to combine my ⅓ plate and ¼ plate lenses, I should be able to produce a smaller picture at the same distance. I have tried, and succeeded in doing them one-half smaller, and a little quicker.

I merely fixed the one combination to *the end of the other* by means of a piece of card-board and elastic bands, placing the smaller behind the other, both being in their usual position as regards back and front lenses.

I do not know whether this style of imitating Petzval lenses has been tried before; but, hoping I have not intruded upon your valuable time, I am, yours, &c., A. R.

P.S.—I send a small picture on leather; it is not a very good one, but it is the best I have of the kind at this moment taken by the above combination.

[The picture sent is a very sharp positive on leather, the only difference observable, except the reduced size, being a little extra distortion at the edge, producing a somewhat more than ordinarily enlarged *foot* of the sitter. Our correspondent is, however, quite "at sea" in supposing that the combination at all resembles the new Petzval lens.—Ed.]

Glasgow, 11th January, 1859.

A NEW "WRINKLE."

To the Editor.

Sir,—Shellac dissolved in wood-naphtha, as suggested by some gentleman lately, answers *well* for coating the gutta percha bath—in fact, after its use, an old-put-by-bath solution worked well again, much to my surprise: all the striæ and *moiré antique* marks have left, as if St. Patrick had been at work!

In return for that gentleman's communication, I will tell you of a contrivance, new to myself, at least, arising out of his suggestion.

My large floating bath required about 80 oz. of silver solution, because of the *concavity* of the bottom; and I often shook my head at the expense when filtering it. Lately, I bethought myself of pouring a solution of shellac into the *hollow*, so as to fill it up to the level parts near the edges. I did so, and put it outside the house; and, though it took nearly a day to get set, it is now quite as I wished it—a smooth, level surface, requiring but fifty or sixty ounces.—I am, yours, &c.,

O. G. REJLANDER.

Wolverhampton, January 19th, 1859.

BOTTLE DIAPHRAGM.

To the Editor.

Sir—In the last number of your *Journal* appears a letter from a Mr. Ross, recommending the use of a diaphragm, of the shape of a Florence flask, on the score that clouds might be taken in a landscape, because the sky would get *less* light than the rest of the picture.

How any practical photographer could have made such a blunder I cannot conceive, as the fact is the very reverse. The addition of the neck has the effect of increasing the light admitted to the sky. The upper part of the diaphragm should be *flattened* (not elongated) to have the desired effect.—I am, yours, &c. B. JONES.

Cheltenham, 12th January, 1859.

[We think our correspondent does not correctly apprehend the point of Mr. W. Ross's remarks—the neck of the bottle is not an *addition* to the aperture, but a portion of the usual opening is taken away by the lateral pieces to form the neck.—Ed.]

PRINTING DIFFICULTIES, &c.

To the Editor.

Sir,—I heartily wish you success with your new edition, it seems to be much superior to the old one. Will you kindly help me out of a difficulty: I am not at all successful with Mr. Hardwich's new toning bath. I cannot get the whites clear, and when I put the print into the fixing bath, it very materially loses its brilliancy of colour and becomes cold. Will you also tell me your opinion of M. Vallantin's lenses (double). With heartfelt wishes for your success, I am, yours, &c.

DUBLINENSIS.

P.S.—Will you give me your candid opinion of your own jolly old honey process, and the new modified oxymel processes.

[Mr. Hardwich's process is a truly excellent one, and if you fail it must be from some error in manipulation. Your pictures must not be *over printed*, that is to say, the *lights* ought not to be discoloured in the printing frame, otherwise, when put into the toning bath, they will of course get a coating of gold, and so never become clear. It is most likely that here your error lies. If your proof becomes cold in tone, it is because you leave it *too long* in the toning bath. A very short time is sufficient to effect the toning, and about ten minutes for fixing. Change the first two or three waters, after fixing, within two or three minutes' time of each other.

We have never even heard of the lenses you mention.

Your last question is rather personal, but we will try and be impartial in our reply:—

If the plate be intended for use within twenty-four hours after preparation, we much prefer our own process and always use it; but if it be intended for keeping an indefinite time, we think Dr. Norris's dry process better, as also the collodio-albumen. We have not any affection for acetic acid when not absolutely requisite; but Mr. Llewellyn's pictures speak volumes for the capabilities of the process; therefore, our preference is very likely only prejudice.—Ed.]

ANSWERS TO CORRESPONDENTS.

A. Brothers.—We have forwarded your letter to Herr Pretsch, 162, Great Portland Street, who will no doubt reply.

Nil Desperandum, &c.—Positive printing by developement is not to our fancy, the results being rarely so brilliant as by the ordinary method of sun printing. We have been most successful, however, by using Hollingsworth's *thick* paper, salted, by floating for about one minute to one and a half upon a solution of chloride of ammonium ten grains, gelatine two grains, water one ounce. Sensitise upon a forty-grain bath of nitrate of silver, expose until a faint image appears, develope by *floating* on gallic acid, *freshly dissolved*, to which is added *one drop* of a saturated solution of citric acid to six ounces of gallic acid solution. When sufficiently intense, wash immediately in *salt and water*, a spoonful to the pint, and afterwards in several waters. Fix with hyposulphite of soda, and tone with chloride of gold very slightly acid.

B. B. F.—We do not approve of long soaking in washing paper proofs; better far to change the water frequently, and hang up each print for a few minutes to drip before putting into a fresh dishful of water.

D.—With lenses of four inches focus for stereoscopic pictures, their distance apart should be $2\frac{1}{2} + 1\frac{1}{4} = 3\frac{3}{4}$ inch to correct to some extent the error arising from viewing these pictures at a distance of six inches from the spectator. If you employ glasses six-and-three-quarter inches long, and have each picture even as much as three inches wide two-and-three-quarter inches is the usual width), you can place your lenses at three-and-three-quarter inches apart by allowing the two pictures to be formed on the *ends*, leaving the spare glass between them. This is just as convenient, as they must be *reversed in position* before insertion in the stereoscope.

Received—"O. G. R.," and "Practical Photography on Glass and Paper." 4th edition. Review in our next.

A number of articles in type are left over.

Owing to the late hour at which a portion of the copy for our last number came to hand, a few typographical errors escaped correction.

THE PHOTOGRAPHIC JOURNAL.

No. 88, Vol. VI. — FEBRUARY 15, 1859.

In the first number of the present volume, we solicited the attention of our readers to the phenomenon of developement of the photographic image upon collodio-albumenised plates in ordinary daylight *after removal* of the iodide of silver — a phenomenon first noticed by Mr. J. H. Young, and communicated by him to the members of the Manchester Photographic Society. In the following number, at page 28, we published a communication from Mr. Young upon the subject, in which some further particulars were given, and a misapprehension corrected relative to the supposed destructive action of cyanide of potassium as regards the latent image, which appears not to be removed, as was at first supposed, but is simply rendered more sluggish in the subsequent developement.

We have frequently pondered over this interesting point since we became aware of it, as well for the purpose of pressing it into our service practically, as to account theoretically for the existence of the phenomenon. We before hazarded a suggestion as to the probable *rationale*, and we now propose to consider it further, partly with a view to enlisting a larger band of experimentalists to prosecute researches in a very promising direction, and partly to call to mind some few facts already known, which appear to us to bear upon the subject.

It is possible that the persistence of the latent impression may be due to the existence of one of the following causes, viz., 1st, an absolute chemical change, such as a very slight amount of reduction; or 2nd, an allotropization, such, for instance, as that undergone by oxygen in its conversion to ozone, or of phosphorous in its amorphous condition; or 3rd, a changed molecular condition of that part of the surface affected by the light. That the molecular condition of the surface exerts a very marked influence on the susceptibility to the actinic impression there can be no doubt whatever, and we have before had occasion to refer to the existence of this fact. The striking experiments performed by Mr. Wenham with collodion upon ivory, in conjunction with many others tending to similar results, forbid our arriving at any other conclusion.

The effect of allotropization is manifested in the power possessed by ozone to liberate the iodine from its combination with potassium, in the well-known haloid salt, iodide of potassium, whilst ordinary oxygen is deficient in this quality.

The capability of intensification by further developement, where even a small amount of metallic reduction has previously been effected, is a circumstance too well known to photographers to need further exemplification.

If either the first or the last of these suppositions be correct, it is not unreasonable to suppose that a careful *microscopical* examination of the impressed film before developement, but after the iodide of silver is dissolved out, may tend to throw some light upon our investigations; and we may possibly also gain further information by the employment of polarised light. At any rate we propose to make such examination, if we can procure any trustworthy specimens to operate upon,— our own constant occupation preventing the possibility of our personally preparing them, especially at the present season of the year.

As may be gathered from Mr. Young's communication, already quoted, that gentleman kindly favoured us with three specimens of stereographs, printed upon glass by contact with the negatives, illustrative of the several points alluded to in his letter, namely,—the red tone of the picture developed after the removal of the iodide of silver by solution of hyposulphite of soda; the subsequent change to a rich purple by the use of chloride of gold solution — (this change, however, was reasonably to have been anticipated, as we have long been in the habit of availing ourself of it in modifying the colour of transmitted positives in the case of ordinarily developed stereoscopic transparencies); and thirdly, the more agreeable tone of the picture when developed after the removal of the iodide by means of the solution of cyanide of potassium. In this last named case the colour is of a pleasant black or dark grey tone.

We did not apprehend that there would be any use in a microscopical examination of *developed* specimens, so far as our present object is concerned; but, as a mere *matter* of *curiosity*, we did look at them, mounted as they were under a power of about forty diameters, and were so much struck with what we saw that we cannot forbear recording some facts which we feel sure will be of interest to our readers.

In one of the pictures, representing a portion of a rural village, with stream, bridges, trees, cottages, &c., in the foreground, is a pretty extensive kitchen-garden enclosed by a hedge. On a microscopical examination we not only perceived that the hedge is formed of the common thorn, which we can recognise by the form of the leaves, but in one corner of the garden is a bed of raspberry bushes, on the leaves of which we can *distinctly see the veins*. In another part is a post, around which a small cord, carelessly twisted, is visible. In another, the subject being the door of some cathedral, there is a portion of the lower part of a window, which to the unassisted eye presents no appearance of any thing remarkable, but under the microscope the window is shown to be one of stained glass of very elaborate pattern, the whole of the leaden tracery being distinctly perceptible.

Had these minutiæ been discovered only upon negatives, we should have thought but little of the circumstance; but the fact of their transference so perfectly to the transparent positive, tells much in favour of this method of printing our stereoscopic slides, and demonstrates their great superiority over paper impressions.

We are anxious to learn whether these facts of post-fixation developement can render us service in working dry collodionised glass plates in the field: for if the impression in the camera be sufficient for the after developement spoken of, a very slight addition to our working apparatus, when ordinarily using dry plates, would remove one objection that has been made to their employment, viz., the probability of our returning home with a number of insufficiently exposed or over exposed plates. We could easily drop a plate into a suitable vessel containing solution of hyposulphite of soda, which could be prepared on the spot, wash and develope at once in broad daylight, without the incumbrance of a tent, collodion, or nitrate of silver bath; we should then see the result of our labours, before leaving the ground, as effectually as if we had worked with humid collodion. Of course this does not remove the present necessity for the much more protracted exposure requisite with dry plates than with those freshly prepared; but we have some grounds for thinking that even this drawback may

also be removed or materially lessened. It is a subject that we go into *con amore*, and always keep a sharp eye upon any facts bearing upon it.

It will be seen by a letter in another column that the "bottle diaphragm" suggested by Mr. Wm. Ross, of New York, is not quite so useless as it appeared to a previous correspondent. There is, however, a still better arrangement to be adopted in the employment of what has been called by its contriver, the "*pectinate diaphragm*," from its resemblance to a comb. This was introduced by Mr. W. Sykes Ward, a successful amateur photographer, with whom we had some very pleasant conversation at the late *soirée* of the Photographic Society upon this very subject. It can be readily constructed out of a piece of black cardboard, and should be placed *behind* the lens. A circular disk, of the same size as the lens, is cut in halves, and the lower half has a series of teeth cut in it, the form of the teeth being comparatively thick at the bases (which lie towards the circumference), and pointed at the apices, which are towards the diameter, the pointed ends, when in use, being upwards. It is obvious that this kind of diaphragm can be readily applied to either the orthographic or the ordinary landscape combination, in both instances behind the lens, and its effect is, we are assured by Mr. Ward, most beneficial in preventing solarization of skies and similar inconveniences.

We understand that the Blackheath Photographic Society contemplates holding a *soirée* before the close of the season, not in its own suburban district, but in the city of London. It is expected that something out of the common way will be attempted, and from the well-known fame of its President we have no doubt that whatever is undertaken will be carried out with the skill for which he is renowned. We have good reason to know that these gatherings are highly beneficial to the interests of our art, far more so even than appears on the surface.

When an editor presumes to print and publish statements relative to individuals, whose *names* he most unwarrantably inserts, it behoves him, at least, to ascertain whether his assertions coincide with *facts* before giving them circulation. This course, however, appears to be about the last likely to be adopted by a contemporary, whose bad example, as regards nominal designation, we will not follow; nor should we swerve from the course we have for some considerable time pursued, of simply disregarding his *personal discourteous* remarks, but that he, in his last issue, so perverts the truth, that we consider our readers are entitled to a correction of the account given.

Our "titular difficulties" have been already explained; we, therefore, leave that part of the statement (the accuracy of which is only equalled by its courtesy) to find its own refutation.

We have nothing to say in deprecation of our conduct being commented upon, even by one who with his own clasp-knife hacks his own fingers; but when an attack is made upon a gentleman who has long ceased to be responsible for what appears in these pages, we think it right to take up the cudgels on his behalf. Mr. Malone did *not* publish the reports of the Birmingham meetings as asserted, and so far as we are aware did not even apply for them.

We first published these reports, in spite of our antagonist's fruitless efforts to prevent us.

Our antagonist says he *withdrew his objections*; truly he acted with prudence—so did a certain animal when he left the room in disgust, as soon as he saw preparations being made for his expulsion in a less agreeable manner. The remainder of our opponent's *personal favours* we shall treat as usual—with silence.

It appears that photographers are to be favoured with an Architectural View-lens, the construction of which is claimed as a *novelty* by its projector. In this he is much mistaken if we apprehend his description correctly, the late Frederick Scott Archer having several years back employed essentially the same arrangement; and we are in possession of, and constantly work with, a lens of this kind, made by Mr. Archer. The only difference appears to be in the back combination of the so-called new lens being absolutely identical in form with the front one, a change which we cannot regard as an improvement, the posterior focus of the whole triple arrangement being always shorter than its conjugate anterior focus.

The special statement, however, which has induced us to remark upon the subject is the following extraordinary one, viz.—"for instance, if a negative were copied by it, full size, the positive would be *as correct as if it had been obtained by superposition.* The same thing cannot be said with truth of any other lens now in use."

This is a great mistake, and we presume the assertion cannot be intended for literal interpretation, otherwise it would be easy enough to demonstrate that there is no possibility of copying a flat surface upon another plane, by aid of *any* lens with spherical curves, without some error, although by *restricting the extent of field* this may be reduced to an almost inappreciable quantity.

We may also remark that the arrangement does not give a flat field, and that the principle is one we advocated (not invented!) about six months ago.

"Wo is me, that I am constrained to dwell with Mesech and to have my habitation amongst the tents of Kedar."

"I labour for Peace; but when I speak to them thereof, they make them ready to battle."

We trust our readers will excuse the insertion of the following unpleasant but necessary castigation. If those who live in glass houses will throw stones, they will have many panes of glass to pay for.—Ed.

"THOMAS SUTTON, B.A."

The Jersey oracle has again spoken; though not with the same potency, yet with about as much truthfulness in its utterances as there was in those of the ancient Delphic auguries.

The proprietor and editor of a Jersey contemporary has bestowed, for many years, some delicate attentions on the proprietor and editors of this Journal—his remarks and allusions being as uncourteous in style as they have been incorrect and malicious in matter.

In his last number he, in his usual bad taste, referred to the differences as to title existing between the Council of the Photographic Society and myself. I trust the readers of this Journal will pardon the intrusion again of personal matters into its columns, while I reply for the first and last time to the remarks of Mr. Sutton. His continued allusions by name to the various gentlemen who have filled the office of editor to my Journal, compels me, contrary to my own inclination, to return the compliment.

I will take his misstatements *seriatim.*

The Photographic Society's resolution alluded to by him had in fact no reference to my publication. The editors of both the London and Liverpool Journals, notwithstanding our "little troubles,' continue to reciprocate friendly courtesies, and, as will be seen, full reports of the London Society's proceedings appear in these columns.

My reasons for the change of title have already been given, and they will be found to differ very materially from Mr. Sutton's impertinent assumptions. As to my reason for hazarding any interpretation the public might put on the change, that is my business—not Mr. Sutton's. This Journal, with whose rise and *prosperity* I have been identified, is not likely to suffer much from the change of title I thought it right to make—which, after all, was of the most trifling character. Up to the present moment, the Council of the Photographic Society has not obtained the injunction Mr. Sutton announced. I do intend to defend—not my "supposed," but my substantial rights. "The Council has had a disagreeable duty to fulfil, and has acted very"—unwisely, as its members will perhaps find at the proper time.

Amongst his tissue of misstatements it would be strange if Mr. Sutton did not stumble into *one* item of truth—here it is: "The matter, however, is no business of ours!" This is *quite* correct. It is *no* business of his; but, then, like Captain Cuttle, he was bound to make a "note" of it in his publication—his destiny in the conduct of his periodical appears to be to act the part of *Meddlesome*, which, so long as he continues to make himself only simply ridiculous, he may do as long as it pleases himself and his readers.

I have invaded *no* "rights" of the Photographic Society, notwithstanding Captain Cuttle's "note" to the contrary. I have never made any concealment of the place, manner, and description, of my publication, and there is little fear of the public needing a cuckoo "note" from Jersey to keep them right in giving their orders; but I have one consolation — there is no fear on my part of any portion of the public mistaking this Journal for the publication carrying on its title-page the well-known "Thomas Sutton, B.A."

So much for the Photographic Society's "troubles." Now for Mr. Sutton's own "little trouble" in the matter of the proceedings of the Birmingham Society. This censor says, "Why should we not tell *the* story?" The proper and natural reading of the sentence should be with the substitution of the indefinite *(a)* for the definite article. Mr. Malone did *not* apply for the Birmingham Society's proceedings. Duplicate copies of that Society's reports were courteously applied for, *after* Mr. Malone relinquished his editorship, and the request was as courteously refused, on the ground of a compact with Mr. Sutton.

Being refused on such grounds—and believing (as I still believe) that all such arrangements are unwise, injurious to the interests of the art, and contrary to the spirit of the times and of our boasted free press—I took means, as manager of the business department of my Journal, to obtain full and faithful reports of the proceedings and papers of the Birmingham Society; and I trust it will be acknowledged that my reporter has pandered to no improper feeling in his reports, but has given the proceedings impartially and truthfully.

While on this subject I may here mention, that a similar compact entered into with the *Journal of the Photographic Society* has caused the same "difficulty" to arise in my obtaining reports of the Photographic Society of Scotland; and although, through the energy and attention of the gentleman who has reported for me in the northern capital, I have hitherto succeeded in obtaining accurate reports, it will be seen, by a letter in another column, that the narrow views of a section of the Photographic Society of Scotland have prevailed, and the numerous readers of this Journal may in future, possibly, be deprived of the benefit—if they think it such—of these reports. Such a state of things reflects no credit for wisdom on the photographic *illuminati* of the "Modern Athens." It is truly "advancing backwards!"

Returning from this digression, I will again take up Mr. Sutton where I left him in a previous paragraph.

Notwithstanding that gentleman's assertion, I never heard of any "remonstrances" on the part of the Council of the Birmingham Society, nor of any concession on the part of Mr. Sutton. "There *is*, probably, still a field open for good Photographic Journalism;" but I feel certain, judging from the past, that few will cast their eyes towards Jersey for such a literary or scientific phenomenon. As to the competency of the editor of this Journal to provide "original" matter for its columns, I leave it to the readers of the Journal to decide; but I will add, from my own knowledge, notwithstanding that these columns, like some others, do not present the appearance of a "rivulet of print, with a wilderness of margin," more *original* matter has lately been left out than would have sufficed to fill the Jersey print.

I will sum up these observations by a few general remarks.

I believe I can account for Mr. Sutton's frequent and pointed attention to this Journal on other than his alleged ground of competition. Some men have their "bubbly-jock" (as I believe it is termed at Newcastle) — and this Journal has been, and is, Mr. Sutton's "bubbly-jock." It has been for some time his special aversion; and I think the Birmingham affair does not fully account for his consistent hatred.

At an earlier period than the Birmingham "difficulty" alluded to, the large and influential Society at Manchester chose this Journal as its special organ, and sent its proceedings to the neighbouring town of Liverpool, instead of on a voyage of discovery to the other side of the island. The honour was unsought by either the proprietor or editor of this Journal, and, consequently, was more highly appreciated. This step drew from "St. Brelade's Bay" some of those polite private epistles to which the "B.A." of that locality is especially partial.

This I will call reason No. 1.

At a later date, when Mr. Crookes was about to apply for the editorship of the London Journal, I was favoured with a proposal from Jersey that took me certainly by surprise; it was no less than that the then *Liverpool and Manchester Photographic Journal* should be amalgamated (!!) with the *Photographic Notes*, and that Mr. Sutton should become the editor!!! It was promised, as an inducement for me to comply, that, under his editorship, it should be a paragon of exellence in journalism! Having some knowledge and experience of the manner in which such publications should be conducted, and having a lively horror of seeing my Journal made a mere vehicle for puffing off a certain "printing establishment," without a moment's hesitation I emphatically, but "courteously," *declined* the association, and thus saved the photographic world of London from the infliction of Mr. Sutton's presence permanently, as he proposed to take up his residence in the metropolis. Some meed of praise is therefore due to me from the London Photographers for preventing the introduction of the "waters of strife." At that period of his history Mr. Sutton did not profess for the London Photographic Society and its organ the profound respect which he now does.

This is reason No. 2.

From that period to the present Mr. Sutton has consistently pursued his course—not of competition—but of opposition to everybody and everything connected with this Journal. So far did he follow this course as to lay himself open to an action for damages (were it not that the communication containing the libel was one of those eternal *private* missives which this busybody is continually despatching in every direction), by pointed allusions to the position of my Journal—at a time, too, when I would not have taken as much for the mere copyright as would, perhaps, suffice for the purchase of a certain publication, together with the plant of a celebrated "printing establishment" closely allied to it.

I now bring my remarks to a close. Mr. Sutton has no right to outrage the common decorum and decencies of journalism by his impudent remarks on a case as yet untried, and seeking, by prejudging the matter, to give a *false* appearance to circumstances. His toadyism of the London Photographic Society of late — and only of late — has been assiduous; upon that body he has been trying the "honey" process with much earnestness. His late communication to the Society's organ (professedly to show *his* goodwill) looked suspiciously like an advertisement—and a cheap one, too! He is a *universal* genius; he has been great in "dodges" — great in "baths and chemicals"—wonderfully clever in lenses and processes; but he swears principally by alcohol! Pope's couplet *(slightly altered)* might be well applied to him :—

One *process* only will *this* genius fit,
So wide is art, so narrow *Sutton's* wit.

In parting company (I trust for ever) from Mr. Sutton, I would recommend to him what Carlyle calls a "wise silence" in other people's affairs in future.

HENRY GREENWOOD,
PROPRIETOR AND PUBLISHER OF "THE PHOTOGRAPHIC JOURNAL."

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE Annual General Meeting of this Society was held on Tuesday, 1st February, 1859 — Sir F. POLLOCK, President, in the chair.

The minutes of the last meeting having been read and confirmed, and seventeen gentlemen elected members of the Society, the following address was delivered by the Chairman :—

Gentlemen, as this is our Annual Meeting, you will have to hear the Report, prepared by the Council, of the progress of the Society, and of all matters that they have thought it necessary to lay before you for your consideration. I am very happy to have hardly any thing but good to report of the past, and I trust, to anticipate of the future. It may be a matter of some regret, that in reference to the finances of the Society, I have to report a slight falling off; but, gentlemen, I have not, like the Chancellor of the Exchequer, in the House of Commons, when he reports a deficit, to propose the laying on of any new taxes. It is not suggested that we need increase our subscription, or enlarge the price of admission to the exhibitions, or to take any other step the tendency of which would be to increase the revenues of this Society; they will (as everybody ought to do) improve themselves — and there are sure signs of such a consummation. The deficit, unfortunately, arises from the failure of (what, I suppose, in this country there is no harm in saying) our commercial speculation, in reference to the exhibitions at South Kensington, and also under the roof where we are now assembled. A proposal was made last year, that this Society should exhibit at the South Kensington Museum — they did so, and the result has been a loss of between £40 and £50; and the exhibitions that subsequently took place in these apartments occasioned another loss of, I think, about £60. We have, however, profited by experience, and do not in the present year exhibit in these rooms — they are out of the way, and though they are convenient enough for the ordinary business

of the Society, they, for some reason or other, are not frequented sufficiently to justify our holding the exhibition here; we have, consequently, as you all know, taken premises elsewhere, and the exhibition appears to present a prospect of very great success. I cannot help observing that upon the opening of the present exhibition there did appear to be a very great increase of manipulative skill, and such as to draw forth the especial praise of His Royal Highness the Prince Consort (whom I had the honour to attend) the day previously to its being opened to the members. His Royal Highness was exceedingly minute in his examination, spoke of the exhibition as being *very* creditable to the Society, and stayed there a longer time than he had done at any previous one. I think I may pronounce the present exhibition one of the best that has ever graced the annals of this Society.

The permanency of our productions is a subject upon which very great attention has been bestowed, and it is an important one, because, no doubt, a very large portion of the claim of the Society to the possession of public utility, arises out of the permanency of the fruit of the labour of its members. Now, if there be any material whatever that can be applied to photography apparently most permanent it is carbon, which, of all substances, seems most indestructible and least liable to decay. It is, according to chemists, antiseptic in the highest degree, and is itself really imperishable. I apprehend, that if a piece of charcoal had been buried in the days of Adam, and dug up yesterday, it would have been found just in the same state as when deposited; and, therefore, we have reason to rejoice at the application of that substance to the purpose of photographic printing. I do not pretend to say any thing about either the process or the inventor, more than that the former is, by some persons, considered an improvement. If it succeed, in all probability it will produce results most acceptable to those, in all classes of society, who regard photographs as permanent records — and I think we may hail it as an advancement in the right direction.

I am sorry to say that the prospect of our being able to "bottle up" light, which I had the honour of suggesting to you last year, has not been realised, and the experiment does not appear to have been repeated by any other person than the celebrated foreigner who communicated it. I understand, that neither Mr. Hardwich nor any other person that I can hear of has repeated it with success: at the same time I think it is perfectly fair to say, that in all probability there has been no misrepresentation on the part of the gentleman who made that communication; and we have reason, I think, to hope, that failure has occurred either from the want of intensity of light, the time in experimenting, or the deficiency of sensitiveness in the paper; in short, that the experiments have not been repeated under circumstances as favourable as those which led to the original discovery.

With respect to our knowledge of light itself, I am unable to report progress of any sort. I am not aware that we have contributed to any discovery that entitles us to declare what light probably is; or to any decisive corroboration of either the theory of Newton, which was that of atoms progressing from the centre of light with great velocity, hence called the corpuscular theory; or of the more generally received undulatory theory. At the Royal Institution I heard recently a very interesting lecture, in which an opinion of Sir Isaac Newton was repeated, that probably light might bear to gaseous bodies a relation similar to that which they bear to fluids, suggesting that all bodies may be capable of assuming a solid, a liquid, and an aëriform state, and possibly a luminous one. Gentlemen, I own we have made no progress in photography which justifies any such notion, or which throws any light upon the subject. I heard the lecture I allude to with the greatest admiration; but I own, that notwithstanding the great and immortal name of Newton, and the admired and respected name of Grove, I could not perceive any grounds for the notion of there being a fourth form of matter, different from, but as it were correlative with, the solid, the fluid, and the aëriform. Gentlemen, I am sure you will forgive me for making these allusions; but, having repeatedly said, that I believe the ultimate labours of photography will be to bring about, if not a perfect theory of light, great advances towards a knowledge of most of its properties, I have thought it right to mention this in connection with the subject, which is, in fact, the fountain of our existence — light to the photographer is like air to animated nature.

I was anxious to say a word or two in reference to what has just now passed before the scientific world, and to state what is my view upon the subject of light. It appears to me, that the effect of light is nothing but the vibration of a fluid of extreme tenuity. We have the example of sound, which is known to be caused by the vibration of the air which we breathe, and light is probably nothing but the vibration of an exceedingly attenuated medium, as much more attenuated possibly as the immense velocity with which it travels exceeds that with which sound progresses. We are able, as a Society, to furnish examples of that which perpetuates art, which encourages science, which promotes all the domestic affections, which records events, and which gives permanence to matters of daily life. I shall be very happy when we have added to these useful purposes any thing that can be called a philosophical addition to the knowledge that we possess of the properties of light.

Gentlemen, we have, as you see to-night, a large increase of members — we have every prospect of our *Journal* being the source of increased income; the Society appears to be progressing in every way: undoubtedly it is becoming more and more useful and advantageous to the public; and I shall be delighted when I can add to all this—that it has contributed one well ascertained scientific fact that shall add one item to the immense mass of philosophy that we now possess.

The Secretary read the report of the Council and the balance sheet, showing the financial position of the Society.

Report of Council.

At the meeting held on this day it is the duty of the Council to present to you their Annual Report upon the state of the Society. It has been customary to connect with that a short review of the progress which the art has made during the year; and happily no anniversary meeting has yet passed away without recording, as the fruit of the year's labour, the acquisition of some new treasure from nature's inexhaustible mine of wealth.

Nor will this year be an exception to the usual rule. We have to congratulate you upon progress made in many of the routes along which photographers are pursuing their researches. In the production of negative pictures, the old wet-collodion process still maintains its pre-eminence. It appears, indeed, to have been but little improved in the theory of its working, but to have become more certain in its results, partly through the increasing care bestowed upon the preparation of materials, partly through the growing experience of its followers.

There are, however, coming into rivalry with it, various modifications of the dry-collodion and albumen processes, which, in addition to their acknowleded superiority in convenience of application, are beginning to dispute the palm with the wet-collodion process in perfection of result. To the truth of this observation, the Society's Exhibitions of the past and of the present year testify most forcibly; nor will it be necessary for you to be referred to the names of those whose efforts in this direction have been most successful, since, doubtless, you have gone along with them in their labours, and shared in the pleasure of their success.

It is, however, for the improvement in the art of printing, that the past year is especially notable. By the general adoption of the alkaline toning and fixing bath, the ordinary chloride-of-silver print has been made both more beautiful and more permanent, while, at the same time, the translation of the photographic original, by transferring it to steel, copper, wood, and the lithographic stone, has been perseveringly studied. Though it cannot as yet be said that any of these methods of carbon-printing have attained such a result as will satisfy their inventors or the public, still the difficulties which beset them are being lessened, and the conditions of success more clearly and more generally understood. A fifth method of printing in carbon, which has lately been brought prominently before you—and which has this especial advantage, that it is, like the silver print, a direct translation of the negative—is perhaps the most valuable acquisition which the art has made during the past year. It rests with the inventor of the process, and those who under his directions are experimenting upon it, that to its undoubted merit of superior solidity it shall add a quality of tone equal to the mellow richness of the silver print.

The increasing interest which the general public feel in the wonders of our art is evident not only from the many new photographic publications of various degrees of merit, of which the past year has witnessed the birth, but also from the frequent notice in the daily and weekly journals of photographic questions, a silent but forcible proof of the growing popularity of the art.

The number of exhibitions and conversaziones in the principal towns of the kingdom, in which the productions of photography have formed the chief element, has never been so great at any former period as during the past months of the current winter season. The commercial applications of the art are rapidly multiplying; and (which cannot but be gratifying to those of its followers who remember the outcry raised against it as a mechanical process) it is at last being discovered that the photographer may employ the pencil of light, not only to delineate crude and literal fact, but to convey a sentiment, to excite the imagination, and set the fancy dreaming.

But leaving the general question of the progress of the art, we come now to the more special business of the evening—the position of affairs of the Photographic Society. Of these the Council regret that they cannot present an entirely satisfactory picture: for, on reference to the financial report, it will be seen that the expenses have been £55 in

excess of the receipts. Of some of the causes of this excess it is not necessary to say more than that they have been removed. The Council and its officers are now alike animated with the earnest desire to work heartily together for the prosperity of the Society; and where there is union there is strength.

The principal cause of the deficit, however, has been the difference of opinion which existed in the Council, and in the Society, as to the proper time and place at which the Annual Exhibition should be held.

It was strongly urged on the one side, that as the Society had provided rooms at a very considerable expense, the Exhibition ought to be held in these rooms, and thus have the advantage of being open at the time when London is most full of visitors, and the weather most favourable to sight-seeing.

Following out this view, the Council did not engage, as usual, the Gallery in Pall Mall, in which had hitherto been held the winter Exhibitions of the Society. This decision was received with much dissatisfaction; for on the other side it was said that the rooms of the Society were not suited for the purpose of an Exhibition, and, though very conveniently situated for the meetings of the members, were not so placed as to be likely to be much frequented by the general public.

It was under the influence of this reaction that the kind offer of the Commissioners of the Kensington Museum, to allow us the gratuitous use of one of their Exhibition rooms was accepted.

Thus were held both a winter and summer Exhibition, each of them resulting in a deficit—the first of £42 5s. 9d., the second of £69 18s. 10d.

If there had been but one Exhibition producing even no surplus of profit, but simply paying its expenses, the balance-sheet would have been satisfactory in its result; it would have shown a surplus of £55.

There is good reason for hoping that the Exhibition of the present year will be of a much more encouraging character.

The management of the Journal has occupied much of the attention of the Council during the past year. With a view of increasing its efficiency they have commenced the publication of a second number in each month during the session of the Society.

It will be seen by the balance-sheet that the Journal accounts present a considerable surplus on the favourable side. It was not with any idea of increasing the funds of the Society that the *Journal of the Photographic Society* was established, but simply that the members of the Society, who, through their distance from town or press of business are unable to attend our meetings, may be kept *au courant* of all that is passing in the photographic world. It has well fulfilled this intention; and it must be gratifying to the Society to find that the strict impartiality with which it is conducted, and the care which is taken by the Council to guard it from ever becoming the medium of unsuitable personal discussions, or the organ for promoting individual interests, have obtained for it the confidence of the general body of photographers to so considerable an extent.

It is the strong wish of the Council to make the rooms in which we meet more useful than they have hitherto been. A commencement has been made towards effecting this result during the past year. Most of the periodicals published here and on the Continent, upon the photographic art, are now to be found upon our table. Others will shortly be added; and it is hoped that, with the aid of the general body of our members, we shall soon have a complete collection of the literature that has reference to our art.

The Society ought also to possess a connected series of specimens of the different forms which the art has assumed since its first creation.

The formation of such a collection is daily becoming more necessary, and at the same time more difficult, as those who were the first to enrol themselves in the photographic army are passing away from amongst us.

Such a collection of specimens of various processes, of records of successive discoveries, would be invaluable for reference, not only for its antiquarian interest, but by its preventing the waste of time and talent which now constantly occurs in the re-discovery of methods long known and for good reasons abandoned.

The materials of such a collection can only be obtained by the contribution of individuals; and to the members of the Society the Council must appeal to aid them in its formation.

It has been already announced in the pages of the Journal, that it is intended to present to each member of the Society, during the current year, a copy of some photographic work approved of by the Council.

To avoid the difficulties which existed in any plan of purchasing photographs for distribution among the members, some of our number have kindly offered to contribute copies of some of their favourite works. It needs, however, still the co-operation of a few more persons before we can be sure of our power of presenting to each member of the Society, during the year 1859, a good photographic picture.

We have now passed in review the principal matters which have affected the Society during the past year. Though the result is of a mixed character, of good and bad fortune, still those who were aware of the difficulties which gathered round us in the early part of the year, and which have been met and overcome, will augur well of the future prosperity and usefulness of the Society.

The Council will continue, as they have hitherto done, to administer the affairs of your Society with the firm conviction that its growth in usefulness is the necessary condition of any increase in its prosperity.

Mr. Bishop remarked upon the auditors' statement of *their* approval of the accounts as uncalled for.

The Chairman—I am not aware whether I quite understand the scope of the member's observations. By "examined and approved," I apprehend that the auditors mean nothing more than that they examined them and found them correct—to have examined them, and nothing more, would have been useless: to approve, without examination, would have been perhaps still worse. I think it merely means, "We, the auditors appointed by the Society, have examined the accounts—that is, we have compared the statements with the vouchers, and find that there has been authority to pay all the bills; and that the receipts appear to be correct." This the individual members of the Society cannot possibly do, and that is the reason why auditors are appointed. It is impossible for this assembled company of gentlemen to go into the accounts. If any one is aware of any thing wrong, or to which it is proper to object, it is competent to him to point out to the Society that real or supposed error; but I am not aware that it is usual to do more upon occasions like the present, than to lay the accounts before the Society; and, in fact, the auditors are the judges selected by the Society to do the duty, which we are bound to suppose they have rightly and correctly performed. It is in consequence of our incapacity or our ignorance that we have appointed persons to perform that office; and they have examined the accounts, and reported that they found them to be correct: they do not mean to say that they approve of the expenditure: they do not mean to say that it is right that any of the money should be spent, but they mean to say—we have examined the accounts and we find that the money has been received, and the money has been expended as the accounts profess it to have been received and expended.

Mr. Bishop suggested, that the very clear views expressed upon a former occasion by the auditor, Mr. Marshall, who went into the subject with enthusiasm on that occasion, and laid down very clear suggestions for their guidance in future, should have been adopted and carried out, in which case every one would have been able to understand the accounts.

The Chairman—It is quite competent at any time—not merely at this annual meeting (for the Society meets much more frequently than once a-year), it is quite competent for any gentleman to give notice that at a subsequent meeting he will move a distinct resolution as to any part of the accounts. The 6th Rule is—

"The Annual General Meeting shall be held on the first Thursday* in February, each year, for the election of officers and council for the year ensuing; for receiving the report of the Council on the state of the Society, and for any other business *of which due notice shall have been given.*"

Mr. P. Le Neve Foster moved the adoption of the Report, which was duly seconded.

A Member recalled to the Chairman his statement to the meeting in March last, as to the proposed new laws, and asked whether any thing had been done with respect to them.

The Chairman—All the information that I can give upon the subject is this, that the laws, although adapted to the embryo state of the Society, were undoubtedly found to be liable to some objection. We were promised that the Council would consider the matter and amend the laws. A committee was appointed and suggestions were made; in the result the Council were not able to adopt any amended laws that were satisfactory, and the matter stands over. We are familiar with that in Courts of Law, where a matter stands over for future consideration; and it is a circumstance which occurs in larger assemblies than the present, having business of great importance. Being unable during the last session to accomplish the object, we shall give it our very best attention on a future occasion.

Mr. Bishop objected to the too sanguine remarks in the Report relative to the Journal, and asked for information whether any Bill in Chancery had been filed against the proprietor of a rival publication?

The Chairman—I believe that a Bill is about to be filed, if it has not actually been filed; but it is right to state in matters of this sort, which are like diplomatic arrangements in another assembly, it may be very prejudicial to the interests of the Society if communications are made pending the progress of a law-suit.

Mr. Bishop inquired, "Who is to pay the piper?" and wanted to know whether the expenses of litigation are to be paid out of the funds of the Society?

The Chairman—Oh! I suppose you would not object to build a bridge from here to the moon at any other person's expense; but

* Now the first *Tuesday*.

if a law-suit is to go on, it must be at the expense of the party for whose benefit it is undertaken.

Mr. Bishop — Then I must ask by whose leave and permission such a step was taken?

The Chairman — By whose what?

Mr. Bishop — By whose leave?

The Chairman — By the authority of the Council.

Mr. Bishop — Then I think they ought to let the members know what they are going to do; because then we can judge whether we are to support them in a litigation of which none can tell the end.

The Chairman — However popular that opinion may be, I think it would be very strange if the Council were compelled to ask the members to enable them to take steps to protect them. It would be analagous to the House of Commons taking steps only by leave of the country, or Ministers taking steps only by leave of the House of Commons. If you have no longer any confidence in your Council, dismiss them. Suppose that some wrong is done, which it is the interest of the Society instantly to redress, by applying to the courts of law immediately, and not to wait for any length of time; and though it may be a question, by-and-bye, for a meeting to say that all this is wrong, yet I think that the Council are perfectly right in doing what they think is for the interest of the Society.

Mr. Hughes complained of the careless manner in which some remarks he had made at a previous meeting were reported in the Journal, and asked who was responsible for the performance of this duty? He objected that the report of what he had said was given in such a manner as to throw ridicule upon him, though his observations had been quite *à propos* to the subject under discussion. He was further dissatisfied, because a letter which he had written in deprecation of this treatment and elucidation of his statements, had not been inserted, and consequently, considered that there was certainly room for improvement.

The Secretary stated that an account of the discussions was prepared from the reporters' notes.

Mr. Malone had a similar complaint to make, viz., that he had been misreported in a very unsatisfactory manner. He considered that this might arise, in some measure, from the undue haste in the publication of the Journal after the meetings, not allowing time for the necessary corrections to be made, particularly when, as was frequently the case, the speakers themselves were the only persons capable of properly amending the reporters' notes. He considered that he had good grounds for his strictures, when he found in the pages of another journal, not the property of the Society, a far better and more accurate report of what took place at the meetings.

Mr. Fenton admitted that he had sometimes winced under the same infliction, for he occasionally found the reports gave as his sentiments something precisely of an opposite meaning to that which he had stated.

Mr. Herve had also a grievance to notice, connected with another department of the Journal — that of the advertisements. He had sent advertisements for insertion in particular numbers, that had been held over from time to time, until his patience was exhausted, and he had now ceased to advertise in it at all.

The Secretary stated that he had nothing whatever to do with the advertisement department, which was entirely in the hands of the publishers. They, in fact, conducted the whole of the business arrangements connected with the Journal.

A considerable amount of further desultory discussion upon this subject ensued, in which Mr. P. L. Neve Foster, Mr. Bishop, and several other members, besides the previous speakers, took part; after which

A Member asked what is the present number of the members?

The Chairman — At the end of the year, 421, which is an increase on those at the termination of the previous year.

Mr. Foster moved the adoption of the report, and the motion having been seconded,

Mr. Bishop moved, as an amendment, that the consideration of the report be adjourned until the next monthly meeting, which was duly seconded, and upon being put to the meeting, negatived.

The original motion was then put and carried.

The officers and new members of Council were then ballotted for, and the following elected:—*President*—Sir F. Pollock, F.R.S., Lord Chief Baron. *Vice-Presidents*—Peter Le Neve Foster, Esq., M.A.; C. B. Vignoles, Esq., F.R.S. *Treasurer*—Alfred Rosling, Esq. *Council*—T. G. Mackinlay, Esq., F.S.A.; C. Thurston Thompson, Esq.; Henry White, Esq.; J. D. Harding. Esq.; N. S. Maskelyne, Esq.; Edward Kater, Esq., F.R.S.; after which

Mr. Bishop, in a complimentary speech, moved a vote of thanks to the Chairman, which was seconded, put, and carried unanimously.

The Chairman expressed a sense of the compliment.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A meeting of the above Society was held at the Literary and Philosophical Society's Rooms, on Wednesday evening, the 2nd instant, Mr. J. Parry in the chair.

The Chairman called the attention of the meeting to the subject of the *Stereoscopic Magazine*, which was intended to be published by the Society and distributed to the members, and invited members to send to the Council, as early as possible, copies of stereoscopic pictures, from which a selection would be made for the publication.

The Secretary, Mr. E. Moon, stated that Mr. J. L. Davies had presented four photographs to the Society's portfolio; these were handed round and much admired for their tone and sharpness.

Upon the suggestion of the Chairman, a vote of thanks was passed to Mr. Davies for his present.

Mr. A. Brothers presented a print, taken by him two years ago; its interest consisted in the colour being retained although it had not undergone the usual process of washing, having been only once rapidly passed through water at the time it was taken, while others printed at the same time, and well washed, had faded.

Mr. Sidebotham read a letter received by him from Mr. Shadbolt respecting the subject of developing by daylight, which Mr. Shadbolt stated he considered to be of great importance, and expressing a wish that the members of the Society would communicate to him further information of the results of their experiments.

Mr. Dorrington explained the satisfactory results of his experience of the raspberry-syrup process; the only difficulty he had to contend with was the extreme tenderness of the film; but he was glad to say that he had now discovered a method by which this could be entirely overcome; he said that he and Mr. Neville had made numerous experiments relative to coating the glass with dilute albumen and other substances, previous to the application of the collodion, and he had at last discovered a plan which was everything that could be desired, rendering the film so firm upon the glass that it would bear any amount of washing without injury, even a water-spout would not remove it. He also thought it would entirely prevent the possibility of blisters in the collodio-albumen process. His plan was to coat the plate with a solution of gelatine in alcohol, and when dry, apply the collodion in the usual way. The solution of gelatine in alcohol, he said, was the same as that recommended by Dr. Hill Norris, the formula of which is given in the number of the *Journal of the Photographic Society*, of the 22nd December, 1856, page 179, and was used by Dr. Hill Norris for coating his dry collodion plates; but he (Mr. Dorrington) thought it more advantageous to use about one-half the quantity of gelatine there stated.

Mr. Sidebotham said he thought Mr. Dorrington's discovery very important; he had tried it with a collodio-albumen plate, and had found it impossible to get blisters. He had also rubbed the glass with his finger previously to the application of the gelatine, and had not been able to observe any trace of the same on developing, he therefore thought this plan would obviate the necessity of cleaning the glasses so carefully.

A general discussion took place upon the subject, the members agreeing that Mr. Dorrington's plan would be exceedingly valuable for all processes.

A number of stereoscopic prints, on glass, taken by Mr. Dorrington, by the raspberry-syrup process, the plates being previously treated with the gelatine solution, were exhibited to the members, and were considered very beautiful, being particularly bright and clear.

A vote of thanks was passed to Mr. Dorrington for his valuable communication.

The prints by Herr Paul Pretsch's process were distributed to the members present. Any member who has not obtained his copy, can have it, by applying at the Society's rooms.

CHORLTON PHOTOGRAPHIC SOCIETY.

The following is given without comment. The proprietor of this Journal feels sensibly the kindness which has prompted the resolution and the official letter which accompanied it. The observations made by the members on the resolution, when proposed, were too flattering to be given here:—

At a meeting of the Chorlton Photographic Society, held at the Chorlton Town Hall, February 9, 1859, it was resolved —

"That this Society highly approves of the change in size and title of the now called *Photographic Journal*, and sympathizes with its Proprietor in the uncalled-for interference on account of changing the name of the Journal to one more worthy of its character."

JOHN HEYWOOD, *Hon. Sec.*

THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The usual Monthly meeting was held on Tuesday last, the 8th inst, in George Street Hall. The chair being occupied by Mr. H. Ross.

A few new members were admitted; but our Edinburgh representative was refused admission on the roll of members, under the circumstances detailed in another column.

After our reporter had withdrawn, the Society's Medals for the best two pictures in the Exhibition were awarded to the successful competitors. These were the first medals given by the Society. The medal given for competition amongst the members was awarded to the Rev. T. M. Raven, for his picture (marked No. 216) *Pierrefette: Pyrenees;* and the non-member's medal was given to Mr. Lyndon Smith, of Leeds, for his picture (No. 416) *The Rising Mist.* Both the successful pictures were noticed in our articles on the Exhibition in *The Photographic Journal* of January 1st and 15th.

After this portion of the business had been disposed of, Mr. J. M. Duncan, advocate, read a paper *On the Law of Copyright, as applied to Photographs.*

A gentleman who was present says:—

"This gentleman is not a member of the Society; but they are hard pushed for papers, and are glad to receive them from any *port.*

"It was a terrible infliction to listen to, being a mere repetition of lawyer *slang* or phrases, 'decanted' backwards and forwards, outwards and inwards, upwards and downwards, for the space of one hour, and was nothing when done, leaving the matter as dubious as ever. However, the usual complimentary vote of thanks was given to Mr. Duncan."

Our friend adds:—

"Mr. Tunny, a professional photographer, claims the merit of every discovery brought before the Society, from Archer's collodion process down to the last enumerated by yourselves — '*gin and water.*'"

Exhibition.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The Portraits.

Edinburgh, February 8, 1859.

I observe you have very liberally admitted your correspondent "Sel d'Or" space for a pretty long critique on the Scottish Exhibition; but, in my opinion, he has ended where he ought to have begun, viz., with the *Portraits*, for these are the right arm of photography, after all. Where do you get your knowledge of manipulation — your exegetics of photography — but from the plodding, practical, hardworking operator, who has a double stimulant to urge him forward? How is he employed? In taking ten or even twenty landscapes in the course of the year—one this week and another that; or, it may be, half a dozen in April, and then, with a hop-step spring over several months, as many more in August or September, that he may have something for the quidnuncs to chatter about when exhibition time comes round, and get his name emblazoned in the *Journal of the Photographic Society*, or, it may be, embalmed in your own pages. No: it is the professional photographer's daily, hourly employment, to *pose* figures and map faces all the year round; and these are criticised tenfold more sharply by the fair owners than all the landscapes that ever were or ever will be taken. Hence, this is the field for practical discoveries of the excellence of this solution, the economy of that bath, the quickness of who's collodion — in short, every process, as it is developed, is put through the crucible of the professional, from that of Archer's collodion down to the latest discovered. A portrait is also a better criterion of the photographer's knowledge of art than a landscape; because in the latter the forms are fixed, and, if the operator chooses the point from which the subject composes best, and takes his view when the finest effect of light and shade suitable for that particular subject prevails, he cannot fail to give a pleasing transcript thereof. In taking a portrait, however, there is a wide field left open for the artist, who must not allow his sitter to squat down in any position that happens, and then take what he thinks the best view presented by that position; but he must try to adapt the position of the limbs, *pose* the head, and arrange the background, so as to bring out the most pleasing characteristic of each particular sitter, unless he means to rest satisfied with the sixpenny photographer's *pose*, viz., one hand resting upon a table, the other in the lap, with the eyes staring straight towards the camera! He must keep constantly wide awake, seize every circumstantial advantage, and vary his compositions with every new subject as necessity demands.

I quite agree with "Sel d'Or" in placing Mr. Rodger, of St. Andrew's, in the foreground, as regards portraiture. He evidently studies his subject, makes the most of it, seldom failing to bring out a bold and pleasing expression, with all needful accessory details — life in the eye and light in the countenance. No. 41, *Portrait of a Young Lady*, beautifully illustrates this point. No. 113, *Marquis of Bute*, in a graceful, easy, dignified *pose*, which could not fail to please the most fastidious critic. No. 627 is another *Young Lady* by this "Homer" of photography, and is the *acmê* of perfection.

Mr. Moffat sends some heads of well-known citizens — that of H. Ross, Esq. (No. 609), is perhaps the most remarkable as an exquisite likeness, in a graceful, easy, dignified attitude; though I would not be willing to vouch that it had not made acquaintance with the brush, which brings it into the category of painting rather than photography. No. 270, *Rev. Wm. Arnot*, Glasgow, is good; so is No. 272, *Robert Dymock, Esq.*, and No. 273, *Professor Aytoun*, No. 278, *Mr. Alexander Whyte*, is an unmistakeable profile; but none of the thirty-six exhibited by Mr. Moffat are at all to be compared with his portrait of Mr. Ross, which his is *chef d'œuvre.*

Nothing daunted by their former experience, the Messrs. Hay contribute forty-nine specimens, out of which number one might surely expect to gather some precious pearls. No. 266, *Portrait of a Lady and Gentleman*, is bright and sharp, though the gentleman's figure is somewhat stiff and formal. No. 298, another *Lady*, is better. No. 363, *An Officer in Uniform*, and No. 373, *A Naval Officer*, are good pictures, denoting progress; and what especially commends them to me is, that while they are soft and pleasing expressions in commanding attitudes as regards *pose*, they appear to be free from paint—except where that is acknowledged and manifestly visible.

Mr. Scott Elliot bids fair to become as distinguished as Dr. Mark and his forty "little men," whose fame, two years ago, daily stared one in the face in every news-room and newspaper throughout the country. Mr. Elliot's two-and-twenty *old men* are very peculiar and varied in feature — a strange collection, but exquisite studies of physiognomy.

Mr. Farmer's *Portrait of Mrs. Lyon* (No. 556) is quite in the late Mr. Szabo's style. Symoni, too, follows it very closely, introducing into every picture the same stiff, formal, curtain in hard, bold, straight lines—of which Nos. 777, 781, 794, and 811, are fair specimens.

The Messrs. Truefit have in all fifty pictures, only a small portion being portraits. They consist of quaint, humourous scenes illustrating sea-side and out-door amusements, in the Wilkie style, but without the *magic touch* of Wilkie.

Mr. Tunny's frame of portraits (No. 393–401), are not what they might be, and I think he does himself injustice in not sending better, which I am certain he possesses. A critic here "is always reminded when he sees one of Mr. Tunny's pictures of the sublime and dignified *pose* of *Sir John Watson Gordon:*" if this refers to that artist's photograph of Sir John, I would say the key note was too low; and if he refers to Sir John's paintings, it is vastly too high, when applied to the frame exhibited.

Mr. Downie, of St. Andrew's, is a new contributor, and sends twenty-eight specimens, the larger number being portraits, closely imitating Szabo. I am satisfied he has a superior master of the art, as a model, nearer home. Nos. 136 and 138 are fair specimens of this artist's abilities.

Mr. Kibble's portraits, by the collodio-albumen experimental process, are sharp, but hard and inclined to woolliness [see No. 232]. However, he may improve by practice.

Mr. Lamb, of Aberdeen, has some large portraits, which look as if enlarged from smaller ones. I think that in general all efforts at large pictures are unsuccessful, and less pleasing than small ones. The same artist's picture, *Castle Street, Aberdeen* (No. 743), is beautiful; and his view in Pitfodels (No. 77) good.

His co-townsman, Mr. Wilson, has several colored pictures of a smaller type, very tastefully touched. No. 860 is a pure photograph, the gentleman having a book in one hand and an eye-glass carelessly pendant from the other—an exceedingly happy and successful picture, in *pose*, expression, and accessories.

Messrs. Kirk, Truefitt, Smith, Hays, and Miss Taylor, all exhibit pictures on glass—well enough in their way, but to my eye they have a cold, hard, grim, leaden appearance, very different to the paper, which is to them as "wine is to water."

Mr. H. Ritchie's quota is not so voluminous. He exhibits only eight, of which Nos. 82 and 103 are fair examples.

Mr. Ramage sends three, enlarged to life size, which are very

hard and uncouth-looking, but might be greatly improved by being wrought up with chalk or colours.

Mr. Valentine, of Dundee, has a good frame of small portraits of medical gentlemen, neatly mounted in a circle, with apparently the "father of the faculty," much larger than the rest, in the centre. They are hung rather high for minute inspection.

Mr. Taylor exhibits a number of nice "nick nackets," with portraits of glass positives, illustrating the application of photography to lockets, rings, watch-keys, shirt-studs, brooches, &c. These are neatly mounted in gold, and are very suitable for presents to either sex.

Padre Secchi's views of the moon are very interesting subjects, exhibited by Mr. T. B. Johnston.

Mr. Bryson's microscopic photographs of portraits, and various other subjects, are in general favour with the public. When the rooms are full it is requisite to keep a sharp look-out in order to find an opportunity for examining them. No. 740 is a frame with fine microscopic subjects, giving an insect *(Sargus cuprarius)* in its natural size, with compound eye and foot greatly magnified; also a section of *Wangha Cane* and *Exogenous Root*, which form interesting studies to naturalists, by A. J. Macfarlane.

No. 62, by W. H. Bosley, is the only frame regarding which I would be willing to lodge a protest. It contains nine small pictures — good as photographs, but in some degree administering to the prurient taste of fast young men. This class of pictures was severely but very justly criticised recently by one of your contemporaries.

The stereoscopic slides, by Mr. Wilson, of Aberdeen, are what they have ever been, the finest out; and those exhibited now are better toned and printed (by a new method) than any ever previously shown in Scotland. Those of Messrs. Ogle and Edge are fine also, but not equal to Wilson's.

I stop here. I trust you will be able to find room in your next number for these few disjointed remarks on the portraits; and, if you think them worth it, I may have a word on landscapes also on some future occasion. LIMNER.

Letters to a Young Photographer.

No. IV.

My Dear Eusebius,

If you read the last number of this Journal attentively, you will have learned something, not only very curious and interesting to you, but also very important in your present stage of initiation to photography. I refer to the letter of the Paris Correspondent, where the writer describes a box, in which sensitised papers may be kept an indefinite time without becoming either discoloured or deteriorated in their sensibility. This is a real boon to photographers, and one which cannot be too highly commended or appreciated. On dull days, in rainy or foggy weather, when you cannot use your camera, you can busy yourself with making a good stock of sensitised paper, which, preserved from free contact of air and moisture in the magic box of M. Marion, will prove a great convenience as well as a great saving of time and materials. Had I possessed one of these boxes during the great heat of last summer, it would have saved me many pounds; for paper prepared during that hot season would not keep long enough to be printed. I presume, therefore, that you are already supplied with one of these paper-preserving boxes, and that you have a supply of sensitised paper carefully stored within it. You next essay to take a proof from each of the several negatives I have sent you. I suppose it is scarcely necessary for me to tell you how to proceed, as you have seen me perform the operation so many times, and one such inspection will save many pages of description. I will, therefore assume that the negative is within the printing frame; that the sensitised paper is superimposed, and the whole exposed to the light. From time to time you lift one portion of the hinged back of the printing-frame, to see how the proof is getting on. It will be advantageous to you to expose all the negatives to the light at one given moment, so that you may ascertain the relative amount of time each one takes to yield a strong picture; and having ascertained this, to carefully examine that particular negative, noting its colour, density, &c., by comparison with another negative that yields a strong proof more slowly. This comparison must be made thoughtfully and cautiously; for you will soon find, when you come to take negatives, that the great desideratum is just that medium point between density and thinness, if I may so express it, which yields a clear strong proof with a minimum amount of exposure. Most of the negatives that have come under my notice, are what is termed over-developed, that is, the high lights are so dense and opaque that it takes hours instead of minutes for the light to penetrate through them. A good negative is one that will yield a strong proof in ten or fifteen minutes in a tolerably clear day. In an over-developed negative, the contrast of chiaroscuro is too abrupt and harsh, the half tones are lost, and a heavy blotty picture is the result. Therefore, I repeat, examine well that negative which yields a *good* proof in the shortest space of time during which it is exposed to the light. The sensitised paper should be cut a little larger than the glass of the negative; the projecting margin will become dark much sooner than that portion of the paper under the picture. When it has become of a deep chocolate colour, and exhibits a prismatic array of colours on the margin, or what from its appearance is termed bronzing, you may conclude that your picture is getting on, that is, if the negative be not too dense. I like to print the proofs pretty strong. The intensity, if too great, may be reduced in the toning and fixing operations.

I will now suppose your proofs printed, and that you are about to proceed to toning and fixing them. If you cannot attend to that operation immediately, place the proofs in the air-tight box until you are ready.

Now, as to toning and fixing, these two operations may be performed in one bath, or they may be done separately. Mr. Hardwich's formula, as given in his *Photographic Chemistry*, is the one most generally in use during the last year or two; and it is doubtless a very excellent one in the hands of a photographer well acquainted with chemical philosophy; but in the hands of a beginner, its results are likely soon to become uncertain. It requires no inconsiderable amount of experience and discrimination to recognise that state of chemical change which has been aptly described as "a state of tottering equilibrium," and you will have to work your way up to it by patient study and constant practice.

The almost universal condition of "fading away" exhibited by photographic proofs, has led to the suggestion of alkaline toning baths, and various formulæ have been proposed of late, with a view of getting rid of the dangers attendant upon an acid condition of the bath, composed according to Mr. Hardwich's formula alluded to above. This chemist has himself proposed a new formula, which you will find on page 4 of this Journal. This formula, when properly attended to, answers very well. I have lately tried one recommended in the Paris Correspondent's Letter in page 11. This formula is the suggestion of M. Bayard, a very eminent photographer. I am well pleased with the results it gives; in fact, like it so well, that I shall probably continue to employ it until a better one is proposed. It gives very rich violet tones, and preserves the whites pure.

Whatever be the composition of the bath employed, the toning agent is generally chloride of gold, and the fixing agent hyposulphite of soda. I say generally, because good results can be obtained without the employment of these agents, and such as cannot be distinguished from those produced by them; but as the use of the substitutes demands a high degree of care and skill, I shall defer communicating the process until you are further advanced in the philosophy of our art.

Before I quit this part of my subject, I may call your attention to M. Le Gray's formula for a toning and fixing process, which you will find on page 39, in the Paris Letter. This I have also tried, and found it very good, but as it is much more troublesome than M. Bayard's, I have not adopted it.

I do not now speak of other methods of printing than those dependent upon the employment of the salts of silver, because they have not yet attained to a degree of excellence that can compare with the latter. It is not at all improbable, however, that a more economical process than that requiring the argentine salts may be perfected sooner or later, and I, for one, pray for the *sooner*.

If you will come to town next week I will assist you in selecting a camera, &c.—Yours, &c.

Photographic Glossary.

Daguerreotype — A heliographic process in which direct positive pictures are obtained upon silvered metallic plates; it is the invention of M. Daguerre. By exposing the silver plate to the vapour of iodine and bromine, a sensitive film of bromo-iodide of silver is formed. After exposure in the camera, the image is developed by the vapour of mercury; the iodide is then washed off with hyposulphite of soda, and the image is fixed by chloride of gold.

Dammar Resin — A white friable resin imported from Java, Borneo, Sumatra *(Dammar Orientalis)*, Australia *(Dammar Australis)*, and other places. It is used as a substitute for mastic in making picture varnish. Although frequently recommended for making a photographic varnish for negatives, it is not adapted for that purpose on account of its brittleness.

Decolouration — The depriving of colour. The solution of nitrate of silver used for sensitising albumenised paper is apt to acquire a deep blood-red colour, owing to a portion of albumen becoming dissolved in it. Various substances have been proposed as decolourisers, such as animal charcoal, pipe-clay, kaolin, and fuller's earth, but the best is a weak solution of chloride of sodium. *Vide* page 33.

Developement — This term is applied to the process of 'bringing out' the latent photographic image, after the sensitive surface has been impressed by the action of light in the camera. A printing process, dependant upon analogous principles, is called printing by developement.

Developing Agents — In the Daguerreotype process the developing agent is mercury in a state of vapour. In the collodion process the agent usually employed is pyrogallic acid; gallic acid is also a general developing agent in the albumen, waxed-paper, and also in the collodion processes. The salts of iron are important developing agents.

Dextrine — This substance, sometimes called 'British gum,' is roasted starch, which by the action of heat acquires new properties, becoming soluble in hot and cold water, and losing its gelatinous quality. Its name is due to the property it possesses when acted upon by polarised light of turning the plane of polarisation to the right. Dextrine may be obtained by the long continued action of acidulated water at high temperature upon starch, and also by the action of diastase. It is a useful substitute for gum-arabic, and is extensively employed in 'gumming' postage stamps.

Diaphragm — Diaphragms are pieces of brass, &c. perforated with holes of given diameters, placed in front or between compound lenses, to cut off the superfluous rays of light, and to produce greater intensity of the image as well as to correct aberration.

Diapositive — A diapositive picture is a positive picture intended to be viewed by transmitted light or as a transparency.

Dipper — A simple piece of apparatus for holding the glass plate while it is dipped in the nitrate of silver bath. It may be made of silver wire suitably bent, or of a strip of plate glass, with a cross piece cemented at the bottom to prevent the glass plate from slipping off.

Distortion—When the image produced on the focussing screen is not an exact counterpart of the object in respect to proportion, it is said to be distorted. It is difficult to construct a lens that shall yield an image free from distortion, owing to the spherical aberration inherent to their spherical form. The greatest skill of the optician is directed to the attainment of that object.

Double Iodide —A strong solution of iodide of potassium is capable of dissolving a minute quantity of iodide of potassium; the mixture is termed the double iodide of silver and potassium. It is used in the calotype process.

Diactinic — A transparent body, such as blue or white glass, which allows the actinic or chemical rays to pass through it, is said to be *diactinic*. For a lens, diactinic is a better term than achromatic. Yellow glass is *adiactinic*, as it is opaque to the chemical rays.

New Books.

A Manual of Photographic Chemistry. By T. F. Hardwich, Lecturer on Photography in King's College, London, &c. Fifth Edition.

(John Churchill, New Burlington Street.)

There is a good story that has often been told, of an antiquary who possessed a pocket-knife upon which he set great store, because it had been presented by Charles II., upon some memorable occasion, to one of the enthusiastic and credulous archæologist's ancestors. The knife was always carried about with him, was in constant use, and paraded upon every possible occasion — indeed, many a remarkable incident was connected by tradition with the knife, which had quite a little history of its own existence; amongst other things, of course, the exact date of the addition of a rivet, a new blade at such a time, a new handle at another — so that on reckoning them up, it was found that there had been forty-two new blades and fifteen new handles!

Now, we do not mean to say that the identity of Mr. Hardwich's fifth edition of his manual with the first, is quite so problematical as was the case with the antiquary's knife; yet the two, when compared, bear some such relation to one another as the promising lad to the well-developed intelligent man. We find that there are upwards of 120 additional pages as compared with the fourth edition; but this alone is not a measure of the new matter, as a considerable quantity more has been substituted for that which has become obsolete, in consequence of our increased knowledge of various facts and better comprehension of the phenomena connected with the practice of the art.

We know of no more conscientious guide than Mr. Hardwich, who is indefatigable in examining, collecting, and comparing stray scraps of knowledge, besides all the more important facts in any way bearing upon the scientific branch of photography — nor is he less active in putting to the test of actual experiment the various practical suggestions which he meets with, provided they offer even the probability (not to say possibility) of improvement. This in itself is no trifling qualification for a teacher, and must entail upon him an amount of labour infinitely greater than most persons are aware of. From his position as lecturer at King's College he naturally comes in contact with a large number of devotees to the photographic passion, all the more enthusiastic and eager in consequence of the intoxicating influence (if we may use such a term) that is usually experienced by all, who for the first time find they can produce a presentable picture.

One of the pre-eminent qualifications of a teacher is his own aptitude for learning and utilising the knowledge of others — and this qualification Mr. Hardwich possesses in a very considerable degree; hence it is that in each succeeding edition of his work, we not only obtain the benefit of the author's own contributions, which are large, but also the labours of other willing workers in the field of photographic research, and these refined from the previously adherent dross, being subsequently sifted and examined by the experimental tests dictated by the skill and acuteness of such an accomplished operator as this gentleman has proved himself to be.

In the present edition, amongst the alterations and additions, we find particulars, given in a popular style, of all the new forms of photographic lenses introduced into use during the past two years.

One of the most important novelties will be found in Chapter VI., on the production of pyroxyline, and on the chemistry of the nitrate bath; to those who make the production of collodion a matter of business, the mass of valuable information (we had almost said *in*valuable) contained in pages 95 to 110, will repay them many times the whole cost of the book, while to every photographer it is satisfactory to know how to do this work properly, even if he prefers to perform the operation by deputy.

In the pages we have quoted, the author has freely published the experience he has gained during the past two years in manufacturing collodion, not upon a small scale, but what is much more difficult to do with any thing like uniformity of result, in very large quantities, many hundreds of gallons having been prepared by him; and this fact of the increased difficulty of operating upon a large scale will be acknowledged by every maker of collodion.

There is new and valuable information relative to the production of collodion positives upon glass, as also with reference to the correct application of different developing agents, and the circumstances under which each is most useful.

A few pages are devoted to the various modes of paper printing, by aid of bichromate of potash and the organic and other substances lately associated with it, in order to avoid the use of silver salts.

There are hints on the construction of glass operating rooms, on taking instantaneous pictures, and some very useful ones on photography in hot climates, including advice upon packing apparatus and chemicals for long journeys.

In Chapter III. of Part II, we have the excellent method of toning, by alkaline chloride of gold, recently given in a paper by the author at the Photographic Society; and Chapter V. of the same part contains particulars of several preservative processes, amongst which that with collodio-albumenised plates finds most favour, and elaborate details are given for practising the same.

The above are mere indications of the good things to be found in Mr. Hardwich's *Manual*; and it is not too much to affirm, that no professional operator or amateur, desirous of pursuing the scientific branch of photography, can *afford* to go without a copy of the work in its present form.

Practical Photography on Glass and Paper. By Charles A. Long. Third Edition.

(Bland and Co., 153, Fleet Street.)

There is, perhaps, no greater proof of the general and increasing spread of the photographic *furor* than is evinced in the publication of a large number of elementary manuals, some of them extending to several editions.

It will not be necessary for us to enter particularly into any detailed description of the contents of the present work, seeing that as this is the

fourth edition the public must already be pretty well acquainted with it; we may, however, remark, that a chapter upon "colouring positives upon glass" has been added on the present occasion.

We regret to notice, that the system of toning paper positives by means of the old hyposulphite of soda bath—a system now almost exploded —is still recommended. This will probably make way for more recent improvements in the next edition; when we hope, also, to see the acetic acid left out of the chloride paper sensitising bath.

Of course, there are many points to which a practised manipulutor might object; but *manuals* are not intended for skilled operators, and certainly the novice will find much in this pamphlet that will be of service in initiating him into the mysteries of the "dark room," and the mode of conducting photographic incantations.

Foreign Correspondence.

Paris, February 10, 1859.

THE beautiful specimen of Herr Pretsch's photolithographic process, presented with the last number of your *Photographic Journal*, has excited a most vivid interest and intense curiosity among our photographic *savants*. I regret that you did not forward to your agent a larger supply of copies; I was literally besieged for mine, and could have sold it many hundred times over for what would have produced thrice its weight in gold. The one topic in photographic *salons* and *ateliers* is now "photographic engraving;" and although new processes are announced daily, "the cry is still they come." Photographers must consider themselves under great obligations to your enterprise and liberality, in thus providing them with so interesting a specimen of the applicablity of photography to book-illustration, &c.

Apropos of this subject, a communication from M. Jobard, made to the *Acadèmie des Sciences* so long ago as 1840, but only now divulged, of a method invented by him for obtaining lithographic impressions from heliographic images. As the process is very ingenious I shall quote it *verbatim*. He says, "In my first experiments with the daguerreotype, which art I introduced into Belgium, I recognised the possibility of lithographing heliographic images, by exposing a stone or plate of zinc coated with iodine. Being myself a lithographer, it was natural that it should occur to me among the first. The stone or zinc plate, instead of being developed by exposure to the vapour of mercury, must be immediately covered with a thick solution of gum-arabic, blackened with lampblack, and put away in the dark until the gum water becomes dry. The stone is then plunged into a bath of water to dissolve the gum, and washed. It is next placed on the printing press, and an inked roller passed over it. The portions of iodine which have been decomposed by the light are found to have been removed by the gum which has been placed upon it, which has, in fact, *prepared the stone* for printing from, that is to say, has communicated to it the property of repulsing the particles of oily ink, but which are attracted, and attach themselves to, the portions in which the iodine is undecomposed, whether the iodine be allowed to is remain or removed with a soft sponge. In this way we may obtain proofs perfect in every part, with the whites quite pure; but this is a very delicate operation, and can only be successfully performed by a very skilful lithographer. The zinc plate is treated in exactly the same way as the stone. The main point in obtaining a successful result consists in applying as little ink as possible to the roller." M. Jobard has kept his secret nearly twenty years, but with what motive it is not easy to divine, as his process is ingenious, and has not been anticipated entirely by others.

Like the other sciences, photography has its martyrs. I will relate the tragic fate of one who fell a martyr to photographic engraving. Whoever has moved within the magic circle of Art in this city, must have encountered one of its noblest and most devoted enthusiasts in Hurleman, the engraver with a wooden leg. How he gained this member history sayeth not; but neither he nor his friends would have parted with it, nor exchanged it for a better on any account. There was a wonderful power of expression in that amorphous wooden leg: it was the index of his feelings and emotions, the confidant and interpreter of his thoughts. It imparted a supernatural eloquence to the music of his steps. Was he happy? It rattled along the pavement in bounding steps, expressing the joy of the owner's heart in all sorts of fantastic curves and quirks. Was he sad or melancholy? Then it came upon the ear like the solemn sepulchral tread of the statue-ghost in Don Giovanni. Unfortunately, the latter phase was too often apparent: Hurleman was poor, miserably poor, in this world's goods, but rich, unspeakably rich, in genius and devotion to his art. He had one bosom friend as poor and as rich as himself—one Carl Muller, a true genius, but who fell an early victim to the assaults of poverty. Hurleman never truly felt his poverty excepting when it stood in the way of his enjoying good books and the treasures of the world of art, or the pleasures usually indulged in by artists. Gratuitous exhibitions were never missed by him; but only those that attacked his purse. As an engraver his talent was truly remarkable; no less so was his skill and delicacy of handling. In the manipulation of his art he had no equal; while the fertility of his inventive resources was unlimited. When, in 1846, photographic engraving engaged the attention of the learned, to whom should they so naturally apply as to poor Hurleman? Great was his delight when he received from M. Fizeau the commission of engraving a daguerreotype plate, with the congratulations of his friends upon his success in his delicate task. But when the *Acadèmie* decided upon intrusting M. Fizeau with the engraving of an important series of daguerrian plates, with a view of encouraging similar researches, and of giving the artist some testimony of the interest his labours had excited, then Hurleman's joy knew no bounds. On the day when Hurleman left the sitting of the *Acadèmie* charged with this important commission, he was like one demented. He could not remain in one place two minutes at a time, but rushed from one quarter of the city to another to announce his good fortune to his friends and to purchase materials. Then, truly, the wooden leg appeared to perform St. Vitus's dance; nothing else could describe its eccentric gyrations. It is supposed that he must have travelled on his unequal members some thirty miles in the latter half of the day. This was more than his frail nature could endure. Under a weight of fatigue, care and anxiety, he mounted to the top of the lofty staircase leading to his humble lodgings, and throwing himself exhausted on his bed, was soon attacked by typhus fever, and in a couple of days breathed his last sigh upon the bosom of his wife, with his only child, a son, clinging piteously to his side. The cemetery of Mount Parnassus was near by, and there they made his grave. But the tragedy was not yet concluded: his poor, loving wife, exhausted with the terrible woe and grief that had so suddenly fallen upon her, succumbed, in her turn, to the stroke of the disease. She sank into the bed from which the cold corpse of her husband had just been removed, with the conviction that her last hour had arrived. To the entreaties that she should be removed to a hospital, her reply was,—"No! let me die here, where he died!" On the following day she was interred by the side of her lost husband, and the same funereal cypress waves over their graves. In the room, so lately redolent with their humble joys and happiness, there remained, stupified with grief, their orphan son.

Hurleman was beloved by many who would have flown to his side at the first hour of his illness, had they known of it, but this sad drama was enacted only in the presence of the performers themselves. On the day succeeding the catastrophe, my friend Baldus thought he would call upon the poor engraver, to see how he was getting on with his work. He mounted up to the sixth storey and gaily jerked the bell. But in vain, no response! He continued to ring, until an old woman, who occupied a neighbouring apartment, attracted by the noise, came to offer an explanation, leading the little orphan by the hand. A few words explained all the sad story, and she opened the door of the deserted apartment. It was nearly empty: the poor artist had been obliged to part with every thing to sustain his family, save one — an engraving after Raffaelle's *Madonna*, which his poor friend Muller had given to him with his latest breath. M. Baldus took away this engraving, and made up a little lottery to dispose of it, by which means he raised a sum sufficient to bind the orphan apprentice to M. Lerebours, the optician.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N. All* ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this* Journal, *should be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

Correspondence.

BOTTLE DIAPHRAGM.

To the EDITOR.

SIR,—Having tried the form of aperture in the diaphragm of a lens for landscapes, mentioned by Wm. Ross in your valuable *Journal*, I beg to state that the effect produced is a beautiful clearness over the whole picture. By placing the diaphragm within the lens, instead of externally, still greater clearness is, in my opinion, thus produced.

I am, yours, &c.

January 2, 1859. DAWSON CAMPBELL.

CLOSE PHOTOGRAPHIC SOCIETIES.

THE PRESS EXCLUDED.

To the Editor.

Sir,—As correspondent of your Journal from Edinburgh, I request a little space to make public the proceedings of the Photographic Society of Scotland, in connection with my presence at their monthly meetings —proceedings which I consider to be at variance with liberal and open conduct, and not calculated, by any means, to raise that Society in the estimation of the scientific public. The facts are briefly these —

Being requested by the publisher of your Journal to send up reports of the papers read at the meetings of the Photographic Society here, I attended the last meeting of the season, held in July, and that in November when the new session commenced; I took short-hand notes of the proceedings, which I transcribed in an abridged form, and duly forwarded to you for publication. At the close of the November meeting I was questioned by the Secretary as to the capacity in which I attended the meetings, and informed that gentleman that I was there as reporter for an Edinburgh newspaper and also for your Journal. The Secretary thereupon explained to me that he would be only too happy to see me present in the former capacity, but that in consequence of a special arrangement which the Society had entered into with the *Journal of the Photographic Society*, the presence of a reporter for another photographic newspaper was contrary to the wishes of the members generally. The arrangement alluded to he stated to be as follows:—that the *Journal of the Photographic Society* had agreed, in return for an *exclusive* and official report of the Society's proceedings furnished to their paper, to supply the members of the Society with copies of the Journal at prime cost or at a reduced rate. He went on to state, that if my presence at the meeting was under the sanction of the managers of the *Journal of the Photographic Society*, the Society would not object to my taking notes, but as matters stood, the presence of any reporter for a rival journal was objected to.

In a few days after the November meeting, I called upon the Secretary at his office, and after a lengthy conversation, requested that he would insert my name on the business circular for the December meeting of the Society as a candidate for admission as a member, in which character I considered I would have an undeniable right to take notes of whatever transpired at the meetings. This course, Sir, appeared to me to be my only alternative, after hearing, personally, the opinions of the Secretary. Through some informalities, my name was not inserted in the circulars either of the December or January meetings, but it appeared in the programme of the last meeting held on Tuesday. I thought it my duty to attend that meeting to see how matters turned, and the result I will briefly narrate. In answer to a question by a member, as to how my presence would affect the special arrangement with the London Journal, the Secretary, after reviewing the circumstances of the case, and the conversation which passed between us, intimated, that if the Society did not adhere to the arrangement with the London people, the copies of the Journal would of course not be supplied at the reduced rate in future, and moreover, the Society would not have acted in an honourable manner with the other parties to the agreement. A discussion afterwards ensued, and the result of the ballot was, that twenty-three black balls were thrown in against my admission to the Society, and two white ones in my favour. The President, in acquainting me with this condition of things, gave me an assurance, on the part of the Society, that in proceeding as they had done, the members acted solely on the principle of the aforesaid agreement, without any consideration whatever of a personal nature.

This exclusion from the Society I consider to be both unfair and impolitic. In the first place, I will venture to assert that there are many members who, up till the last meeting of the Society, were entirely ignorant of the agreement referred to. That all persons joining the Society should, without intimation of any kind, be bound down under an arrangement of which they know nothing, appears to me to be a system of secret tyranny. Why should not the members of a society — formed for the purpose of forwarding a certain art — have the privilege of taking whatever notes they please in their private capacity, and transmitting them to any quarter? Are they to be prohibited from exercising this right? If so, it is manifest injustice. If an arrangement such as this really exists, why is there no mention of it in the Society's laws, so that members joining may fully understand, before sending in their names, the peculiar conditions under which they attach themselves to the Society. Several gentlemen on Tuesday evening expressed themselves strongly against a reporter being allowed to take *verbatim* notes of every paper read at their meetings; upon which I thought it well to state openly that such was not my intention, and would not be my practice if admitted on the roll, and that I should restrict myself to sending condensed notices — though not limiting them to any specified extent— of the business that transpired. Now, how is it that the Society has so strong an objection to any report sent up to other than their patron journal? Simply because they receive copies of the paper "at a reduced rate." For a few pence, then, saved per week or fortnight, here is a leading scientific society placing itself, body and spirit, under the sway and guidance of the organ of a distinct association, located four hundred miles away. Do they gain by it? Yes, assuredly, by the pence in question. Is there any sacrifice to the "filthy lucre?" is there any loss of independent action? I leave you, sir, to judge — I leave you to weigh in the scale, against the coppers, the result of this mean motive, for the exclusion of the public press. But it is an agreement, and it would be dishonourable to break through it! Is it, I ask, an agreement on any real solid principle? By no means. The Society send their papers to one public scientific journal. Is not publicity a benefit to all well-organised associations? The Society admits this, by the very fact of sacrificing so much to print. In what respect, then, would the Society not gain by wider publicity? Really the Photographic Society of Scotland must have been (to use a popular phrase) "bamboozled" by their friends in London — their ingenuousness must have been largely imposed upon. Surely it would be more honourable to cancel so absurd an arrangement than to preserve it — more advantageous to the science they seek to make known — more just to themselves as a society, if scarely so profitable as otherwise to their pockets. As it is, the mysterious agreement comes to an end on the 1st proximo. May I ask the obliging Secretary whether the interesting event will be recorded on the minutes, or endorsed on the back of the *parchment certificate of compact*, so that the hundred or more members may have some idea of the approaching crisis? That it is an important event who can doubt? The Secretary himself took the trouble to inform the forty or fifty gentlemen present on Tuesday night, that by the arrangement no less a sum than *Twelve Shillings per annum* was saved to each of them. Undoubtedly these worthy gentlemen never before supposed that their balance sheets were so largely affected by their membership. Were it not for distressing the Secretary, I think, sir, I could show that the twelve shillings is a shilling or two *beyond* the mark. Perhaps the Society will, after March, raise its terms with the *Journal of the Photographic Society*, and get the cost per copy of that paper further lowered by one penny or twopence. What an immense influx of members would the Society then experience! Why, sir, it would surely induce some thirty out of the forty professional photographers of Edinburgh to join it, instead of the miserable, but "dauntless *three*," who at present represent the profession in "Modern Athens" on the Society's roll. It may possibly be *principle* which keeps these thirty-seven professional gentlemen aloof from the Society—not principle on *their* part, sir, but on the part of the Society; for, if you recollect, it was principle that induced the "committee of bachelors," last year, to discard Rejlander's glorious work, *The Two Ways of Life*, which would have carried everything before it in any exhibition, and set up in its stead—strictly on *principle*, mind—a *nude* Niobe, who, assuredly, must have been "all tears" on the occasion!

Now, sir, I do not intend to take up space by recounting how the matter of my exclusion has been "worked" by the Secretary, or by noticing the preliminary "meetings of council" to get up the brief for the prosecution—these immense efforts being so well represented in the attendance on Tuesday night, which was much larger than usual. I am content to believe that the black clique of "twenty-three" is only the majority of a meeting, and not of a Society. The members could not have objected to my admission on the ground of not being a professional photographer or an amateur; for, like many other members who have never divided the Society in submitting their names as candidates for entrance, I am simply an "admirer of the art." I do not know, sir, what the rules in such questions are with other kindred societies; but I am bold to affirm, that few would adopt the course which the Scottish Photographic Society has taken in this instance. The society is "close" and exclusive—beyond the periodical "paragraphs" they forward to local journals here, and beyond the lengthy MS. they forward monthly to their fostering mother,— *The Journal of the Photographic Society*. Members must not take notes and use them at discretion — or at *indiscretion* — on pain of blackballs and exclusion!

Let the scientific public, then, shun an association which is dependent and so excessively "honourable" to its agreements; for it never can, while existing under the trammels of an opposition society, and working under such mean conditions — conditions too mean to figure in the laws and regulations — secure that respect to which otherwise its eminent position might lay claim.— I am, yours, &c. P. M. F.

Edinburgh, February 8, 1859.

[We think our correspondent errs in his selection of the vulnerable point:— the Society has made a *defensive* treaty; there is no reason why it should also be *offensive*. — Ed.]

HONEY PROCESS, &c.

To the Editor.

Sir,—I am extremely obliged to you for the kind way you have helped me out of numerous difficulties. The only way I have of showing my gratitude to you, is in advocating your very ably written and valuable Journal to my friends, both amateur and professional, which I do with my utmost power. I have met, I am sorry to say, with some failures in your simple and beautiful honey process which has succeeded so well in other hands. I find, on developing, that the picture acquires a disagreeable *red* tone, and is covered with minute holes. I do not know where to find a detailed account of the process, which would remedy the evil complained of, and give me some idea of the length of exposure required in comparison with the humid collodion process. There is an account of your process in Mr. Sparling's book, in "*Orr's Circles*," succeeded by a paper on the same subject, by Dr. Mansell, of Guernsey, which I suppose you know. Do you consider his modification of your process as good as the original?

Accept my apology for trespassing on your time, and, with sincere thanks, believe me to be yours, &c., ELY.

P.S.—Will you also please to tell me how I could get sufficient intensity with iron developer.

[We thank you heartily for your kind expressions.

The red tone in the negative is rather an indication of over-exposure. If the collodion be suitable, that is, moderately *old* and spongy in structure, and the syrup well filtered, you ought not to have the minute holes. Dr. Mansell's modifications are good, especially the use of steam before developing, and the pictures taken by that gentleman bear undeniable evidence of his success.

For *ordinary* dry plates we prefer Dr. Norris's or collodio-albumen, that is, if we have to prepare for use at an *indefinite time;* but if for use the following day, we still stick to our old *sticky mess,* as we have seen it designated. For interiors we know it to be first-rate, better even than wet collodion.

We find that, at this season of the year, the iron developing solution recommended by Mr. Hardwich is also good for syruped collodion, viz., distilled water six and a-half drachms, Beaufoy's acetic acid one and a-half drachms, protosulphate of iron fifteen grains—dissolve; then add acetate of soda ten grains. After exposure (lens fourteen inches focus, aperture five-eighths of an inch) for four minutes, steam the plate by holding it over a dish of hot water, then pour on the above-named developer; the image will appear rather slowly and very likely in patches, but this is of no consequence; keep the solution gently flowing backwards and forwards until the whole is *evenly* developed, and as soon as this has come about, *immediately* wash away the iron solution, no matter how weak the picture may be. Fix with hyposulphite of soda, wash well with common water, drain slightly, and then wash with a *few ounces of distilled water*, again drain, and pour on some of the following, namely, distilled water one ounce, pyrogallic acid two grains, citric acid one grain, to which you must add about twenty drops of pure solution of nitrate of silver (about thirty grains to the ounce), but *not that which has previously been used for baths* or any other purpose.

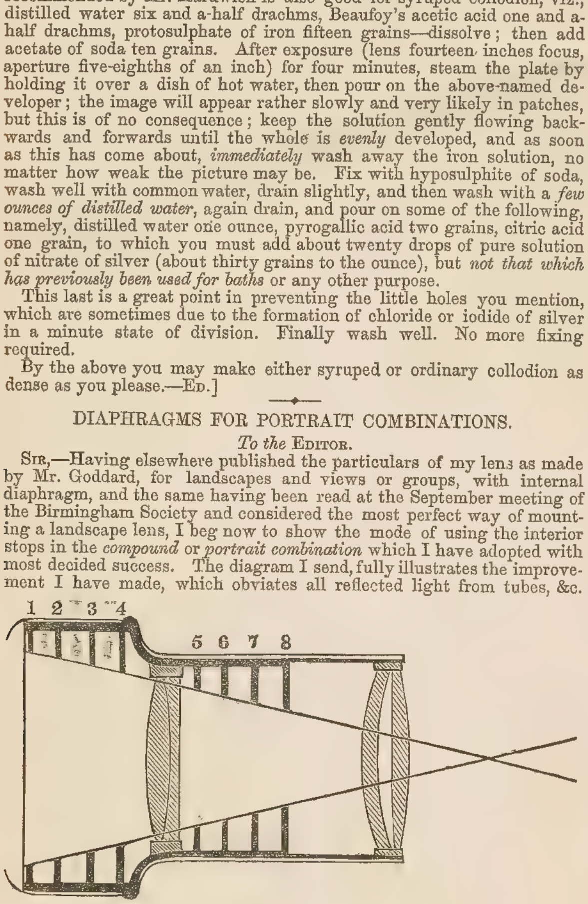
This last is a great point in preventing the little holes you mention, which are sometimes due to the formation of chloride or iodide of silver in a minute state of division. Finally wash well. No more fixing required.

By the above you may make either syruped or ordinary collodion as dense as you please.—Ed.]

DIAPHRAGMS FOR PORTRAIT COMBINATIONS.

To the Editor.

Sir,—Having elsewhere published the particulars of my lens as made by Mr. Goddard, for landscapes and views or groups, with internal diaphragm, and the same having been read at the September meeting of the Birmingham Society and considered the most perfect way of mounting a landscape lens, I beg now to show the mode of using the interior stops in the *compound* or *portrait combination* which I have adopted with most decided success. The diagram I send, fully illustrates the improvement I have made, which obviates all reflected light from tubes, &c.



The figure shows the stops as Nos. 1, 2, 3, 4, in the funnel or projecting front, 5, 6, 7 in the tube, and 8 the central diaphragm, which for $3\frac{1}{4}$ lenses may be $2\frac{1}{4}$ without any loss of active light or of definition, which will be greatly assisted by the whole. All false glare will be removed, and any one may easily make the addition with cardboard, well blackened; it can be made to draw out, a tube being constructed of cardboard first, then the stops fixed in by rings of cardboard glued between each, which holds them fast in.—I am yours, &c.

69, Blenheim Street, Newcastle-on-Tyne. JOHN BROWN.

For a $3\frac{1}{4}$ lens No.	5, is $2\frac{3}{4}$ in opening.	The front,	or No.	4,	is $3\frac{1}{4}$	in opening
„	„	6, „ $2\frac{1}{2}$	„	„	„	3, „ $3\frac{3}{4}$	„
„	„	7, „ $2\frac{1}{4}$	„	„	„	2, „ 4	„

AN OPEN QUESTION.

To the Editor.

Dear Sir,—I think that if the Photographic Society has another exhibition next year there should be some arrangement so as to evince an aim beyond mere show and sale. Classify and specify, if you like, and keep each class in a separate division or compartment. For instance:—

1. Portraits.
2. Sea and landscapes.
3. Architecture.
4. Still life representations.
5. Scientific illustrations and machinery.
6. Studies from cattle—all sorts (no studies from man or woman allowed, unless in becoming habiliments !).
7. Made-up groups and manufactured pictures.
8. New methods of printing, or different manipulations for silver prints from those in ordinary use.
9. Novel applications improvised during the year.
10. Copies of prints or pictures, or sculpture (altogether, for I see no more difficulty in copying a good print than a bad one).
11. Instruments.

It might then yet be a novelty and rest to the mind, since there would be less confusion.—I am, yours, &c.

Wolverhampton. O. G. REJLANDER.

PASTE-BOARD CAMERA BACKS.

To the Editor.

Sir,—From the report, contained in your last number, of Mr. Rogerson's observations on the subject of paste-board camera backs, at the last meeting of the Chorlton Photographic Association, your readers are at liberty to infer, that the Macclesfield Photographic Society has been the means of bringing forward the article to which he alluded. Permit me to say, that although this form of back was introduced, probably for the first time, at the meeting of the Macclesfield Society in June last, and has since met with considerable favour amongst its members, the credit of the idea is due to Mr. W. B. Osborn, treasurer of the Birmingham Photographic Society, who will, doubtless, be able to give any information your readers may desire respecting it. I trouble you with these remarks, in consequence of inquiries having been made from us as to the slide, as well as from a sense of what is due to the gentleman just named.—I am, yours, &c.

C. R. JESPER,
Treasurer to the Macclesfield Photographic Society.

Macclesfield, February 9, 1859.

VALLANTIN'S LENSES.

To the Editor.

Sir,—In answer to a query of your correspondent, "Dublinensis," in your last number, regarding M. Vallantin's lenses, I notice you say that you have never heard of them.

As agent in Scotland for M. Vallantin, will you allow me to inform you, that he has been a manufacturing optician for thirty-five years, and that he has received two medals for his lenses—one (of the first class) at the Paris Exhibition in 1855; and all my experience goes to prove, that his lenses are uniformly very good.—I am, yours, &c.

Glasgow, February 4, 1859. JOHN SPENCER.

WANTED—A SOCIETY.

To the Editor.

Sir,—I wish you would give the Glasgow photographers and amateurs a hint that they are not up to the times—that they, like those in other large cities, should have an extensive Photographic Society and occasionally an Exhibition. I am aware that there is a Photographic Society in Glasgow; but it is a very quiet one. I know, also, that there is the Photographic Society of Scotland; but its head-quarters are at Edinburgh, and few photographers can afford to lose a day, and spend about ten shillings, to see the Annual Exhibition. Hoping that my suggestion will meet with approval, I am, yours, &c. J. R. A.

Glasgow, Feb. 8, 1859.

ANSWERS TO CORRESPONDENTS.

K. R.—Thank you for the news.

James Burns—Have an adjustable front to your camera by all means. We have a scheme for a cheap swinging-back that we may very likely publish shortly—also one for a very steady folding tripod.

T. S. S.—We have never tried lenses by the maker you name—but *report* does not speak very favourably thereof. We think you must be somewhat confused in your ideas about Petzval's new form, which is *not a portrait* combination, as your remarks about the diaphragms seem to imply you imagine it to be.

A Young Beginner—Ammonio-ferric-oxalate is better known as the *ammonio-oxalate of iron;* it is a double salt of a crystalline nature, and of a light yellow colour. It is analogous in composition to the *ammonio-citrate of iron*, which is kept by most druggists, and which latter for photographic purposes may be generally substituted for the former. *Ammonio-oxalate of iron* can be obtained from most good operative chemists, *not druggists*, or may be made as follows:—Into a solution of oxalic acid, pour some per-chloride of iron (kept by druggists), when a yellow precipitate will be formed; pour off the fluid and dissolve the yellow powder in liquor-ammoniæ; evaporate and crystallise.

"R. T. W."—"A hater of Personalities"—"W. Housley"—"Veritas"—"D. W Hill"—"Doubtful," &c., in our next.

Received—"J. S."

THE PHOTOGRAPHIC JOURNAL.

No. 89, Vol. VI.—MARCH 1, 1859.

It is with no small amount of regret that we feel called upon to repudiate the responsibility for anything that appears in these columns; but as regards the last report of the meeting of the Photographic Society of Scotland, given at page 47, we are constrained to do so most emphatically, a portion of it having been couched in language that we cannot at all approve, and would most certainly have declined to sanction for publication under any conceivable circumstances, had the same been submitted to us as usual. Fortunately we were in Edinburgh on the day of publication, and going into the shop of our agent in that city the same evening, we discovered the inadvertence, and lost no time in *immediately* calling upon the gentlemen whose proceedings are commented upon so unceremoniously, in order to express our regret for the occurrence, and to explain how it had taken place. Although the gentlemen alluded to were good enough to accept our explanation as satisfactory to them, we feel that our readers also are entitled to know how the matter occurred, as we should be very sorry to allow it to be supposed that any one with whom we have relations should be liable to similar contumelious treatment, the recurrence of which we have taken stringent measures to prevent in future.

The facts are as follow:—In consequence of what we must still regard as the ill-advised exclusion of our reporter from the meeting of the Society, a member who was present and who dissented from the policy pursued, furnished us with a statement of the proceedings, with comments thereon in the light in which they were regarded by him, but intending the facts only to form the basis for our report.

It unfortunately happened that at the time when the communication came into the hands of our printer (a few hours only before going to press), *we* were wandering in the "Land o'Cakes," and our movements were unavoidably somewhat eccentric, so that no proof for correction reached our hands. Knowing that reports of meetings are valueless unless published within a moderate time after the meetings are held, our printer, with more zeal than discretion, inserted it just as he had set it up and without any editorial supervision at all—hence the somewhat startling form in which it appeared.

There are few matters that have not their comic side, and this is no exception:—so to show how differently the same thing strikes the various parties concerned, we may instance that the culprit in the offence above noticed coolly remarks, that he sees no objection to describing the expressions used by an advocate as "lawyer's slang," *and thinks it not half so bad as calling his assistant a* Printer's Devil. This ought to be conclusive.

In our report of the last meeting of the Manchester Photographic Society, some observations will be found from Mr. Dorrington, relative to the advantage of employing a thin film of albumen or gelatine upon glasses previously to coating the same with collodion.

It is somewhat singular, that on the very day on which we received our copy of that report, being then at Glasgow, we were informed by a local professional photographer, that he had for nearly a year and a half been in the habit of coating all his plates with albumen, whether intended for positives or negatives, upon collodion; and this was without our having previously named to him the communication to the meeting at Manchester. On the following evening, we again met with similar information from an amateur photographer. So that, although in each case a considerable difference in the manipulatory details was recommended, the *principle* was identical; and the concurrent testimony to its value occurring in three different directions appears to us as highly satisfactory.

The Manchester report speaks for itself. Of our two Glasgow friends, the first named, Mr. McNab, described his method of operating as follows:—The glasses being cleaned, some albumen from a new-laid egg having been first mixed with about five or six times its volume of water, is to be lightly rubbed all over one side of the glass by means of a small piece of thoroughly clean sponge, then a quantity of the dilute albumen poured on and off again (the previous sponging being to cause the albumen to flow readily when poured on); and having been drained pretty closely, assisting off the superfluous quantity at the lower angle with blotting paper, the glasses are to be immediately dried in front of a brisk fire, which operation is accomplished in a few minutes' time. The plates can be stored away in racked boxes, and are then ready for the collodion. The film is so thin and brilliant, that it is difficult to ascertain which side has been coated; it is therefore advisable to place them in the boxes with the coated side always turned in one particular direction.

Mr. Church, our other friend, proceeds in a different manner as regards the preliminary operations; and he states, that some dilute albumen with which he coats the plates has been in use for *many months.* To a quantity of white of egg, say one ounce, half a drachm of liquor ammoniæ and six ounces of water are added, and the whole shaken together. The glasses are cleaned with a little dilute nitric acid (acid one part, water three parts), rinsed under a tap, slightly drained, and immediately, while still wet, coated with the dilute albumen, and then dried as above described. By this plan, in course of time, the albumen becomes a trifle more diluted; this, however, causes no inconvenience, and the strength is easily restored by the occasional addition of a small quantity of undiluted albumen.

In the exhibition of the Photographic Society of Scotland, now open at George Street, Edinburgh, we noticed some pictures by Mr. Kibble, of a character very much out of the common way, some being portraits and others landscapes, but all taken with a single combination lens of long focus, and all in a very short space of time, upon dry plates; the exposure varying from the one-fortieth part of a second of time to five seconds for some of the views, in which the ripple on the water, the clouds, the houses, and trees, are all included; the portraits ranging from five to fifteen seconds of exposure. These productions are not without some faults, the landscapes being scarcely as sharply focussed as we should like, for instance, but are highly interesting and valuable, as indicative of accomplishing a great desideratum—the introduction of living objects into our landscape subjects, and that, too, upon dry plates.

We had the pleasure of an interview with Mr. Kibble, but are not at liberty to state more at present, than that his success in this direction is chiefly owing to long-continued and careful developement of the impressed film, well protected from light of

any kind. Mr. Kibble is still actively engaged in the prosecution of his experiments, and as soon as they are completed he has promised to publish the results.

Mr. Kibble's productions are unlike most instantaneous pictures in one very important particular, being of large dimensions; and some idea of the labour undertaken by him may be conceived when we mention that he has coated plates five feet in length, and in one instance has occupied *ninety hours* in the developement of a single picture, the solutions requiring frequent renewal.

We think that the last few months have been prolific in the publication of important points in connection with the dry processes.

We have so many inquiries just now in connection with the toning of paper positives, partly in consequence of a remark we made lately, "that we had considered the use of the *old* hyposulphite bath for that purpose quite exploded," that we presume a few remarks upon the subject may prove acceptable to some of our readers.

Our reason for the supposition expressed arose from the fact that we feel convinced the majority of our professional photographers are desirous of producing proofs that are *permanent* in their character; and as it has been demonstrated beyond a question that proofs toned with gold instead of with sulphur are undeniably more stable, and the manipulation thereof moreover by no means more difficult, we presumed that none knowing the better course would resort to the worse. It appears, however, from the letters we receive, that there are some who are not familiar with the more approved methods of toning with gold.

This material was first employed for the purpose in an acid condition by M. Le Gray; the chief inconvenience experienced being the necessity for an enormous amount of over-printing in order to preserve the proofs from total destruction of the half tones. Mr. Sutton recommended the substitution of sel d'or, or double hyposulphite of gold and sodium, and this avoided the great destruction of the half tints; but, as was demonstrated by Mr. Hardwich, the reduction of the gold was due to the formation of sulphide of silver, and thus the lights sometimes suffered and became of an unpleasant yellowish hue. In order to obviate this yellowness we employed a bath of carbonate of soda between that of the sel d'or and hyposulphite of soda. Subsequently our friend Mr. Forrest, of Liverpool, gave a formula for the use of chloride of gold with an excess of carbonate of soda in one bath, to be applied to the proofs with a brush. In the *Journal of the Photographic Society*, for 22nd of November, 1858, page 88, we find the Editor quoting a bath, suggested by Mr. Waterhouse, in which the addition of citric acid to the preceding is recommended.

On the 7th December last, Mr. Hardwich read a paper, at the Photographic Society, *On Toning with an alkaline chloride of Gold*, an abstract of which appeared in our No. 85, p. 4. We may remark that a typical error (subsequently corrected) there quotes the strength of the gold solution at one grain to the *ounce* of water, instead of to the drachm. The principal novelty introduced is the elevation of the temperature until commencement of reduction of the gold is indicated by a bluish tinge in the solution, in which condition it is exceedingly active. After toning, the proofs are fixed in an alkaline solution of hyposulphite of soda, in order to prevent the chance of liberating sulphur. This is a process that cannot be too strongly recommended as efficient, permanent, and certain in its results; neither is it more troublesome than other methods, especially if performed, as employed by Mr. Church, as follows, viz.:— Take of solution of chloride of gold (eight grains to the ounce of water) one fluid drachm, sesqui-carbonate of soda (commonly called bi-carbonate) one drachm, citric acid twenty grains, water six ounces, and dissolve. Then add to the preceding six ounces of boiling water, and use it immediately. After all redness, when viewed by transmitted light, has disappeared, rinse the prints in common water, and fix in a bath of hyposulphite of soda six ounces, carbonate of soda half an ounce, water one pint — wash as usual after about ten minutes immersion.

We believe that by this process gold is substituted entirely for silver in the formation of the image.

Another very excellent method has been published by Mr. F. Maxwell Lyte, which is very analogous to the preceding, and also produces beautiful results. Ten grains of neutralised chloride of gold, with three drachms of pure phosphate of soda, are to be dissolved in one pint of distilled water. The mixture should be neutral to blue litmus paper; if not, a little soda must be added. In this, as in Mr. Hardwich's method, all free nitrate of silver must be washed away, and the proofs immersed in a weak solution of salt and water before submitting them to the toning bath. Bi-borate of soda (borax) 108 grains, may be substituted for the three drachms of phosphate above indicated. Any quantity of this bath may be prepared and kept in stock, as it does not deteriorate; but only so much of it as is requisite should be employed for toning any prints, and the residue *not* returned to the stock bottle, but any remaining gold, &c., precipitated by any convenient method. The toned prints may be fixed in the bath previously recommended, or in one having a little chalk diffused throughout it — the latter preferred by Mr. Lyte. Either of the above processes is applicable to albumenised as well as to plain paper proofs, and we are convinced that photographers will find much advantage in their use.

We have been favoured by an inspection of specimens of Mr. Hooper's turpentine waxed-paper pictures, which are clear, sharp, intense, and full of half-tone; the process will be found in another column.

Mr. Forrest has also sent for our examination some of the cardboard dark slides alluded to in his note, published in the present number; they are very ingenious, and, in our opinion, so convenient, that we purpose adopting them, with some trifling modification, for dry collodionised plates.

We are informed by M. Martin Laulerie, Acting Secretary of the French Photographic Society, that an extension of twelve days for sending in specimens for exhibition at the forthcoming Exposition at the Palais de l'Industrie will be accorded in favour of foreign contributors, who give notice of their intention to exhibit on or before the 20th instant. Communications to be addressed to M. Laulerie, No. 11, Rue Drouet, à Paris.

OBSERVATIONS ON THE DRY COLLODION PROCESS.

By Charles Heisch, F.C.S.

I am not about to bring forward another new process, and possibly not to say any thing new; but I think one of the objects of societies like our own is, that each member should give the others the benefit of any observations he may make.

During the past seasons I have been working at dry processes; and, like most others, spoiled many plates before I got any good results, and it is the hope of preventing other beginners from spoiling so many, which has induced me, in the absence of any more important paper, to make a few observations this evening. Until last season I had never tried any of the dry processes, because I had not seen any pictures from dry plates which were not hard black or white things, as compared with those from wet plates;* but at the beginning of last summer, Mr. Heath showed me some pictures taken by the Rev. Mr. Cleaver, which equalled any thing I had seen from wet collodion negatives. Mr. Heath kindly procured for me particulars of the process employed by Mr. Cleaver, which I found to be Maxwell Lyte's metagelatine process, with the addition of a little honey and citric acid to the gelatine solution; but the collodion contains a large proportion of bromide, and in this I believe the beauty of his results depends. In No. 76 of the *Journal of the Photographic Society*, Mr. C. has published his process, which differs in one or two points from that he originally sent to Mr. Heath.

* I do not under the head of dry processes include the honey, as that is rather used as a means of preventing the plate from drying.

You are all aware that I advocate the use of two equivalents of iodide to one equivalent of bromide of ammonium, for landscape collodion, wet or dry. I believe the condition of things to be just about this:—that you may take six views on a wet collodion with only iodide, and by a proper arrangement of stops, &c., five out of the six will be very good, but the sixth will not, though by the use of a proper proportion of bromide it may be taken well and easily; while on a dry collodion, if it contain only iodide, for one view that you can take you will find five that you cannot—that is, if you look for any thing like delicacy of half-tone and proper effect. I now always employ the same collodion for dry plates which I before described to this Society, using nothing but iodide and bromide of ammonium.

Some difference of opinion exists as to the kind of collodion best suited for dry plates—some advocating a pyroxyline made at a high temperature, others as expressly directing a low temperature to be employed. My own experience is in favour of a pyroxyline, made at as high a temperature as possible, without producing an explosion, and using plenty of it in the collodion. It is but little use giving formulæ for making pyroxyline, as many very good ones are already published; but it is impossible to communicate the one great requisite—experience; and every one must make up his mind to produce a good deal of bad pyroxyline before he makes any uniformly good. I make my collodion as follows:—

Pyroxyline	8 grains.
Ether	5 drachms.
* Alcohol	1 ditto.

Iodising solution:—

Iodide of ammonium	18 grains.
Bromide ditto	6 do.
Alcohol	1 ounce.

Two drachms of this solution to six of the collodion. This makes a very strong and highly iodised collodion, and requires a bath of proportionate strength; for, in collodion, as in paper, if the bath be weak in proportion to the collodion, the iodide is not firm in the film. This is the case to even a greater extent when bromides are employed than with a simply iodised collodion. The bath I find to work the best is made thus:—dissolve one ounce of nitrate of silver in three of distilled water; to two ounces of this add about three grains of iodide and one grain of bromide of ammonium, previously dissolved in a little water, making the whole up to nine ounces by the addition of water and half-an-ounce of spirit of wine; filtering, and finally adding the remaining ounce of solution of nitrate of silver. It will be observed, that the iodide and bromide are added to the bath in the same relative proportion as to the collodion. I have tried using them in different proportions, but never then got the bath to work so satisfactorily. It is just possible that this may be accidental, but so it is.

The salts of potassium may be substituted for those of ammonium in the bath, preserving the same relative equivalent proportions. I have been led to enter into these details concerning bromised collodion, because some of my friends have been troubled with streaky plates, &c., when endeavouring to use it; and as I believe it to be the proper thing for dry plates, they are not altogether out of place here.

With respect to the various substances that have been proposed for coating the plates, I do not know that, as far as the results are concerned, any one is very superior to the others. The great points seem to be to use it as thin as possible, so as to form a coating at all, and to put it on the plate in a proper manner. I prefer the use of metagelatine, because of its convenience. It will keep any time when well prepared, which renders it superior to albumen, which must be used pretty fresh, and it may be employed cold, which makes it much more convenient than gelatine.

What I have used was according to Lyte's formula, only with the addition of more spirit. It consists of one ounce of gelatine, eighteen of water, and two of spirit of wine. This ensures the keeping of the solution, and makes it run very limpid. The addition of citric acid I am inclined to think no improvement; it appears to have a tendency to produce that excessive intensity which is the great evil of dry plates. With respect to the addition of a little honey, I can hardly yet make up my mind; but I think it may give increased sensibility.

For washing I have used the vertical bath, as recommended by Mr. Cleaver, and believe that it is better not to wash the plates too much: a quart of water will wash a dozen stereoscopic plates quite well.

* The alcohol is distilled first from chloride of calcium, and then from potash, and the ether from potash, so that both are anhydrous, and free from all products of oxidation. They should be preserved in small bottles, quite full.

Much has been said on the necessity of drying the plates in an oven before coating them with the collodion, to prevent blistering. I have no doubt it is a good plan for those who have convenience for it; but if the collodion be kept for some little time after iodising, and the metagelatine be thin enough, I have not found it necessary. I have found the collodion work well after keeping a fortnight or so.

The coating the plate with the metagelatine is the most important part of the process, and it is the proper management of this that enables one to dispense with so much washing. When I first began I did as is usually directed—drained the plate after washing, poured on the preservative solution, and worked it backwards and forwards on the plate for some time before draining it off—and nine-tenths of my plates turned out bad. The preservative solution has, of course, a much higher specific gravity than the film of water on the plate, and when thus mixed with it, makes those whirling sort of marks which always accompany the mixing of solutions of different degrees of density; and even if the movement of the plate be continued till all these whirls cease to be visible, the sensitive coat is often marked indelibly; moreover, whatever nitrate of silver may remain in the film of water on the plate, is thus mixed with the preservative solution, which renders it necessary that the washing of the plate should be very perfect before the said solution is applied. By proceeding in the following manner I have never had a marked plate:—

After the plate is removed from the water bath, let it drain well with its lower edge on some blotting paper, and dry the back of the plate also with blotting paper. When well drained, hold it quite horizontal (a pneumatic plate-holder is the best thing for this purpose), and pour some of the metagelatine all along one of the shorter edges of the plate (about two drachms does for a stereoscopic plate); then tilt the plate very slightly, so as to make the solution flow in one slow even wave to the other end of the plate—not slanting across it. The solution being more dense than the water on the plate, forces the latter before it, and leaves only what is actually in the pores of the collodion; it is quite curious to see the quantity of water thus pumped out, as it were, from a plate which seemed perfectly drained. When the solution has all collected at the lower edge of the plate, tilt it very slightly towards one corner, and allow the excess to flow off; then pour on a second quantity of the metagelatine in precisely the same way, and at the same end of the plate as the first, and let it flow off in the same manner. This second quantity does over again for the first coating of another plate. The plate should then be placed up on end to dry, when it is ready for use. The only other point on which I have anything to remark is the developing, and much depends on doing this sufficiently slow. First make a developer as follows:—

Pyrogallic acid	6 grains.
Spirit of wine	½ ounce.
Glacial acetic acid	½ drachm.
Water	5½ ounces.

After the plate has been well wetted with distilled water, pour over it a solution, made by mixing half an ounce of the above, with half an ounce of water, and two drops of a thirty-grains solution of nitrate of silver. This developes the picture very slowly, and of a feeble light brown colour, but the developement may be continued till all the details are brought out in the deepest shadows. When this is the case, wash the plate and cover it with the undiluted developer, with four drops of silver solution to the ounce; with this any degree of intensity may be obtained, but a rather feeble looking negative prints best, as the peculiar colour of these dry negatives arrests the chemical rays very perfectly—much more so than would be supposed from their appearance. If you begin developing with a stronger solution, or one containing more silver, the high lights develope so much more rapidly than the rest of the picture, that they become quite opaque before the detail is half out. The plates are, of course, washed and fixed in the usual way.

TURPENTINE WAXED PAPER PROCESS.

By W. Hooper.

The paper should be thoroughly dried before it is immersed in the following solution:—

I.

Turpentine or camphene	20 ounces.
White wax	1 ounce.
Iodine	2 drachms.

Dissolve by the aid of heat, placing the bottle containing the above

mixture in a vessel of water kept warm. When the wax is completely dissolved, filter through bibulous paper.

The paper may be left in this solution from five minutes to as many hours, without any difference being perceptible in the result. When it appears thoroughly saturated, it may be taken out and hung up to dry. Make a second solution as follows:—

II.

Water	20	ounces.
Iodide of potassium	300	grains.
Bromide of potassium	50	"
Chloride of sodium	30	"
Sugar of milk	200	"
Iodine......Sufficient to tinge the mixture of a deep sherry colour.		

Or this formula may be varied as follows:—

III.

Serum of milk	20	ounces.
Iodide of potassium	300	grains.
Bromide of potassium	50	"
Chloride of sodium	30	"
Iodine	qu. suf.	

Immerse in either of the above as many sheets of the paper, prepared according to the first formula, as the solution will cover, and allow them to remain about an hour. Let them drain, dry between blotting paper, and then hang them up to dry.

The sensitising solution is composed of—

IV.

Water	10	ounces.
Nitrate of silver	300	grains.
Acetic acid	5	drops.
Citric acid	5	grains.

and the mixture saturated with iodide of silver.

Float the papers on this solution in the usual manner; then wash them in water, in the proportion of *three ounces of water* to each quarter sheet of paper, and preserve the washing water for subsequent use. Make a saturated solution of gallic acid, and take

V.

Gallic acid solution	2	ounces.
Water	1	ounce.
Washing water	1	"

This forms the developing solution.

Any convenient quantity of papers may be placed at one time in this solution, which must be in the proportion of three ounces of solution to every sheet 11 × 9, adding fresh solution in that proportion when every new sheet is immersed in it. Fix in hyposulphite of soda of the usual strength.

As compared with the ordinary collodion process, the time required in the camera is, of course, much greater, say five to ten minutes, with a lens of sixteen inches focus and half-inch stop; but it is much quicker than the ordinary waxed-paper process. The rapidity of the turpentine waxed-paper process depends mainly on the washing.

The only objection to this process lies in the smell of turpentine, which to many persons is particularly disagreeable; but this inconvenience may be partially avoided by the use of camphene.

Printing with this paper may be done by gas-light; in about five minutes the details come out, if the light is sufficiently strong.

In washing the sensitised papers the water employed for the first lot, in proportion as above given, may be *added* to an equal quantity of fresh water for the second lot of papers, thus gaining the convenience of a larger quantity to manipulate with; while the *strength* of the dilute nitrate of silver, thus washed off the papers, *remains the same*—an important feature in obtaining uniform results. A third and any subsequent number of additions to the first quantity of water may be added in a similar manner; hence one of the objects of preserving the washing waters.

Too great a proportion of bromide reduces the intensity of the skies.

I have never kept my papers more than two days, so cannot speak as to their quality in this respect; but by immersing any not used in the solutions II. or III., they are restored to a condition ready to sensitise on a future occasion, and I fancy they then give even better results.

HINTS ON THE FOTHERGILL PROCESS.

By John Glover.

I have for some time worked this process with great satisfaction, and have just developed a negative on a plate prepared about eighteen weeks ago, giving proof of not the least deterioration from keeping. I am, therefore, constrained to add my quota of experience in favour of this beautiful and certain process; the more so, as I conceive I have simplified the means of preparation and fathomed to the very bottom the causes of failure. I shall therefore enumerate the main points to be most carefully and undeviatingly attended to, and the reason for each.

First, on removing the plate from the bath, *allow it to well drain, and lie on the levelling stand half a minute before pouring on the washing water.* This will allow the æther to evaporate, and the film will be in a condition *not to repel the water*, the pouring on of which is the most delicate part of the operation, and unless done as above, the negative will be liable to patches more or less sensitive than others.

Secondly, *drain off the washing water most thoroughly at one end of the plate,* using blotting paper to absorb the last portion; then pour on the albumen *at the contrary end to the one at which the plate was drained,* slightly inclining, so as to flow steadily across. When it reaches the opposite end, *allow one-half to run gently over into the waste dish;* this carries away the last portion of the weak silver solution, which, if allowed to mix with the albumen in quantity, would coagulate and *be carried back over the other portions of the plate,* tenaciously adhering to the film, and preventing the subsequent action of the developer: semi-transparent, wavy markings, are the result.

And now comes the washing away of the albumen, which must be completely done.

The simplest and quickest mode is as follows:—have ready a large vessel of common water, and a good sized bottle of distilled water; into each, drop a quarter-inch india-rubber syphon, weighted so as to be held near the bottom. Near the opposite ends of the syphons place clips to stop the running at will, and insert glass tubes, three inches long, and five-sixteenths of an inch in diameter, into the extreme ends through which the water makes its exit; these being larger than the bore of the body of the syphons diminish the velocity of the stream. To wash away the albumen, lay the plate across the mouth of any earthenware jar, the whole standing in an empty wash basin, the roundness of the bottom of which allows the plate to be inclined in any position. Elevate the bottoms of the water-containers to the level of the plate to be washed, the syphons being sufficiently long to reach every part. Commence washing with the common water, the plate being slightly inclined, beginning at the uppermost edge. Bring the glass tubes as near the film as is consistent with safety, liberating the water with a movement from side to side, gradually advancing towards the lowermost edge; this takes about ten seconds for a stereoscopic plate. Stop the water and lift up the plate to drain for a moment, and repeat the washing, this time elevating the end last washed; again drain a moment, incline the plate at a considerable angle, and flush with distilled water from the other syphon, then rear up on blotting paper to dry spontaneously.

Contrary to the theory already propounded, I find that whether this last washing be continued for a long or short period the sensitiveness is not affected, nor do I perceive any difference between the plates washed in the dish as directed by Mr. Keene or as above, only that the latter is most certain to remove the surplus albumen and is sooner and easier accomplished. It is obvious that washing with a stream in the first instance, on removal from the bath, would interfere with the sensitiveness; but from my experiments I find that the compound of silver and albumen is not easily disturbed, unless undue mechanical action is allowed to take place in the washing. This is a fact well worth knowing and I hope will prove useful to many who are now perplexed as to the amount of labour to expend upon the plates.

The print I enclose is from the plate eighteen weeks old, exposed on the 28th of January, two minutes, Ross's four-and-a-half-inch focus lens, usual stop. I was anxious to know what it would turn out, and like most other photographers, in a frenzy, I am sorry to add, and sometimes photographers in earnest too, rushed at the first subject that presented, the point of sight chosen being the balcony of the back kitchen. King Fog was holding one of his levees; a yellow January sunlight was peeping over the houses behind, leaving the foreground in shadow and scantily lighting up the principal object, viz., an unbroken line of broken railings geometrically parallel to the horizon. The distant tenements were merging on obscurity, all but enshrouded in the garments of his majesty aforesaid, and if it were possible to look beyond the veil, your editorial eye would revel in the mysteries of the Mersey and the great ships on her bosom; so that my picture, as the knowing artist would say, "leaves a deal to the imagination," and his brother exhibition critic might exclaim at the same time, "altogether presenting a charming composition."

[Notwithstanding the drawback of a subject chosen as described, the result is decidedly favourable to the *modus operandi.*—Ed.]

HINTS ON THE FORMATION OF PHOTOGRAPHIC SOCIETIES.

Scarcely a place on the map of Great Britain but what can boast of its photographer, amateur or professional; and where one true disciple of the art exists, others by the force of his persuasion or example may become such. In all small towns the elements of a photographic society, association, or union, may be said to be lying dormant, and only require the quickening spirit of an enthusiast to bring them together. To such an one the task is simple and easy. Let him first give a popular lecture on the subject, explaining the principles of the art, in as simple and as non-technical language as possible, adding a brief sketch of its history, and illustrating the subject with as many varied specimens as he can make, beg, or borrow for the occasion. Lecture over, let him contrive something of a *conversazioné*, or get up a little discussion, so as to "bring out" the latent photographers, and when the proper degree of interest is excited, then will be the time to propose the formation of a "Society."

The Society formed — How shall it work? We must beware of making it too formal or too cumbrous in its working machinery. At first its business may be limited to weekly or other periodical social meeting, at which each member may contribute his quota to the evening's entertainment, either by carrying photographs for exhibition, by raising some useful point of discussion, or by undertaking to explain certain features in the art with which he may be best acquainted, or in which an unusual degree of interest may be excited. It is very probable that the brunt of the labour may at first rest upon the shoulders of the enthusiastic promoter of the society; but if he possess tact and patience, he may soon shift a portion of his burden to other shoulders. If several societies were to form a "Union," and exchange periodically their photographs, the interest and usefulness of the individual societies would be greatly increased. It is important for the success of such infant societies, that the promoter be a well-informed practical photographer, and he will be the fit person to appoint Secretary. As there may in many cases be a difficulty in the way of forming a governing body of President, Vice-President, Treasurer, &c., these may be advantageously dispensed with — a good working Secretary is worth them all, as they too often prove only "pompous nobodies." The subscriptions from the members may be regulated according to circumstances, from five shillings to a guinea per annum; and if it can be contrived that they shall get something for their money in the way of a photograph so much the better. The expense of rent may in most cases be avoided: for if the Society consists at first only of a few choice spirits, let them meet at each other's houses, and discuss actinism over their tea and toast. It must not be forgotten that photography includes many clever ladies amongst its votaries, and their aid and countenance must on no account be overlooked.

The error committed in forming many Photographic Societies that now exist, or have existed, consists in modelling them on the pattern of regular scientific societies, in which it is expected that original papers shall be read on the evenings of meeting. Now photography is not a subject that admits of that mode of treatment: its real discoveries, such as prove of general interest, are few and far between each other; the little modifications and variations of processes are of interest only to the photographer, who is "deep in for it" in the black art. A much more useful course of proceeding would be, for the Secretary to make up a summary of the progress of photography, which he might collect from the various photographic and scientific journals, and so keep the members *au courant* with the advances made in the art. This would afford an opportunity for interesting discussion, and serve to keep an interest that might otherwise flag. These photographic journals should be subscribed for by the Society, and after they are examined and used by the Secretary for the purpose indicated, might circulate among the members.

In large towns, the business of societies of this kind might assume wider proportions; still, it would be better, in the first instance, to engraft them on some existing literary or scientific asciation, and when they have gained sufficient strength to "go alone," to do so. The social and æsthetical elements, rather than the scientific, are those most likely to conduce to success; all may however be judiciously combined, but the feature most necessary to success and progress is that which secures a distribution of photographs amongst its members, after the fashion of many book societies.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

At an ordinary monthly meeting, held at Myddelton Hall, Islington, on the 23rd ultimo, George Shadbolt, Esq., Vice-President, in the Chair, after the minutes of the previous meeting had been read and confirmed, notice was given that the following alterations and additions to the rules would be submitted for confirmation at the Annual Meeting, in March:—

1. In Rule 6, there be inserted—"That at the ordinary meeting, in February, the officers for the ensuing year be nominated, any member being at liberty to propose names."
2. In Rule 4 — "That instead of one, two Vice-Presidents shall be elected."
3. "That the payment of Five Guineas in one sum shall constitute a Life Member."

Officers for the ensuing year were then nominated for election at the next meeting.

Mr. Hannaford practically demonstrated his iron printing process, and a vote of thanks was accorded to him.

A discussion then ensued.

Mr. Hislop doubted if iron prints *were* permament, as he had a few days ago seen some written papers where the ink had decidedly faded and turned yellow.

Mr. Hannaford was of opinion that this might have been owing to the presence of sulphur, which need not occur by the iron process.

Messrs. C. J. Hughes. J. Spencer, G. Shadbolt, and other members, took part in the discussion on printing and toning generally which ensued.

Mr. Shadbolt exhibited some paper transparent positives and negatives, taken by the turpentine waxed-paper process, by Mr. Hooper, of Manchester, giving very excellent results.

Mr. Shadbolt also exhibited some card-board single and double backs, designed by Mr. Forrest, of Liverpool, and improved by Mr. Hooper, of Manchester.

Mr. C. J. Hughes called the attention of members to vulcanite as a substance preferable to wood or paper for the like purpose, and would wish to know if it had been or could be introduced into use.

Mr. W. Hislop, F.R.A.S., exhibited and explained the use and working of a portable stereoscopic apparatus, made by Mr. Rayne, having a dark box containing a dozen plates, to which the back of of the camera was fitted, and by means of a slide and spring the plates could be transferred from the box to the back, and, after exposure, from the back to the box again, each plate being transferred in rotation. The weight, including the iron top of the stand, plates, and case, being only seven and a quarter pounds, and the price about £3 10s.

Mr. Hill exhibited a beautiful glass transparency, produced by Fothergill's process, by Mr. E. Heseltine.

Mr. Legg presented a card of admirably executed photographs of microscopic objects for the portfolio of the Association.

At the next meeting, on the 30th instant, Mr. W. Hislop has promised to exhibit his lantern for photographic diagrams and pictures.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

A meeting of the above Society was held at the Golf Club House, on January 17th, 1859; the President, J. Glaisher, Esq., F.R.S., in the chair.

After the usual business had been disposed of, a paper was read by Charles Heisch, Esq., F.C.S., on *Observations on the Dry Collodion Process.* [See page 54.]

CHORLTON PHOTOGRAPHIC ASSOCIATION.

[In our last we omitted full particulars of the following report, from motives of delicacy, in consequence of the complimentary nature of some of the remarks; but, finding from a communication that our forbearance has been regarded as a slight upon our kind supporters (an offence of which we certainly had no intention of being guilty), we have no option but to insert the whole, as furnished to us.—Ed.]

The usual monthly meeting of the above Association was held at the Chorlton Town Hall, on the 9th February, 1859, the Vice-President, Mr. J. A. Deane, in the chair.

Mr. Hooper exhibited to the meeting the syphon that he employed for rapidly changing the water when washing prints

thereby thoroughly removing the hyposulphite of soda from them in a short time.

Mr. Wardley stated, that a print washed quickly by a continual changing of the water is more likely to be a good one than when the washing is continued for a long space of time; but that different samples of hyposulphite of soda have different effects on the print, even when toned by the same process.

Mr. Deane highly approved of the method of washing recommended in *The Photographic Journal*, and had, some time ago, taken his prints out of the water to drain and again washed them, as he considered they required, say about six hours in all, and none had yet faded.

Mr. Rogerson was precluded by indisposition from attending to read a paper he had prepared for the meeting.

Mr. Whaite called the attention of the members to what he considered the very unfair treatment which Mr. Greenwood, the proprietor of the late *Liverpool and Manchester Photographic Journal*, had experienced at the hands of the London Photographic Society. He briefly stated the facts of the case, and added, that he thought it a question which concerned photographers generally, and one on which the Society might properly express its opinion. He therefore begged to move —

"That this Association highly approves of the change in the size and title of the now called *Photographic Journal*, and sympathises with its Proprietor in the uncalled-for interference to which he has been subjected on account of changing the name of the Journal to one more worthy of its character."

Mr. Hooper said that photographers were much indebted to Mr. Greenwood for the enterprise and ability displayed in his Journal, and he thought they should lend him their moral support when he had been unjustly interfered with.

Mr. Nicholson hoped some modification might be made in the motion before it was put to the meeting. It embodied two distinct propositions: first — an approval of the change made in the size and title of the Journal; second — an expression of sympathy with Mr. Greenwood under the treatment he had met with. To the latter he made no demur whatever, considering that Mr. Greenwood, in the exercise of his undoubted right to select any unappropriated name for his Journal that he might think proper, had been somewhat hardly dealt with; but he thought it would be imprudent of the Society to commit itself to any expression of opinion on the title which Mr. Greenwood had selected. One was a question of a public nature, which they might very properly deal with; the other was one proper enough for the exercise of individual opinion, but which a public body had nothing whatever to do with.

Mr. Fawcett did not see the force of Mr. Nicholson's objection. He thought they could not properly express their sympathy with Mr. Greenwood, unless they were convinced that he had acted rightly in the change which he had made.

Several members spoke to the excellence of the Journal, and thought the Proprietor was quite justified in adopting his present title.

Mr. Nicholson said that he had no desire to withhold his testimony to the value of the Journal; he believed it was not inferior to any of the photographic serials in point of usefulness or respectability. *He did not even call in question the propriety of the change in title;* it might be good or it might be bad; it was simply a matter for Mr. Greenwood to exercise his own judgment upon, and he thought that the Society, instead of expressing its approval of the particular title which Mr. Greenwood had selected, would exhibit greater wisdom and better taste by limiting its expression of opinion to a *disapproval* of the course pursued by the London Photographic Society. As he could not support the motion, he should submit the following amendment:—

"That this meeting, without expressing any opinion as to the appropriateness of the change made in the title of the *Liverpool and Manchester Photographic Journal*, desires to express its warm sympathy with Mr. Greenwood in what it conceives to be an unwarrantable interference on the part of the London Photographic Society."

Mr. Heywood thought the question of the title a very unimportant matter. What they had to consider was—Had Mr. Greenwood reason to complain of the way in which he had been treated? The members seemed to be agreed on this point, and as the amendment expressed that opinion without entering upon matter which in no way affected the case, he should second it.

The Chairman thought the amendment expressed a very lukewarm sympathy indeed with Mr. Greenwood. For his part, he felt that a great wrong had been put upon him, and if legal proceedings were commenced against him as threatened, he, for one would willingly subscribe his guinea to a defence fund.

Mr. Wardley expressed the same sentiments, and said the Journal was not surpassed by any for valuable information.

After some further discussion,

The Chairman remarked that it would be very desirable that the expression of opinion which emanated from the meeting should be unanimous, and as there was no difference amongst the members as to the unjust proceedings of the London Society, he hoped Mr. Nicholson would withdraw his amendment.

Mr. Nicholson was sorry to put himself in opposition to the Chairman and many members whom he greatly respected; but he looked upon the point at issue between them to be a very important one. He said it was very remarkable that not one of the speakers to whom he was opposed had addressed themselves to the question which he had raised, but had confined their remarks to a point on which his opinion did not differ from theirs; he therefore felt that he had no objection to answer. As his amendment contained nothing to which an objection had been offered, and the original motion did, he should feel it to be his duty to press the matter to a division.

The amendment was accordingly put, and subsequently the original motion, when the latter was declared to be carried.

A vote of thanks to the Chairman was carried by acclamation, which concluded the business of the meeting.

LIVERPOOL LITERARY AND PHILOSOPHICAL SOCIETY.

At the usual fortnightly meeting of this Society, held at the Royal Institution, Colquitt Street, on Monday last, the 21st ultimo, Mr. William Keith read the following paper:—

Photography: Past, Present, and Prospective.

In treating upon the subject of "Photography: past, present, and prospective," he said he proposed to consider, first, the early discoveries in this science, which had paved the way to its present state; secondly, its present position; and thirdly, the probable future application, and the assistance we might reasonably expect from its more extensive application. We did not now regard the productions of the camera with that curiosity and astonishment which were bestowed upon its earlier efforts, on account of the daily and intimate acquaintance which we now had with its results. The most indifferent of its productions were not, however, without their value in the diffusion of knowledge, and an increased appreciation of the beauties of nature and art. We might reasonably infer that the old alchymists, in their search after the philosopher's stone, became acquainted with the fact that some of the preparations of silver were darkened by the action of light. The earliest date, however, which we found was 1777, when the illustrious Scheele made the first philosophical examination of the decomposing action of light upon compounds containing silver, and pointed out what we might consider one of the fundamental principles of photography, without which all our knowledge would be capable of producing very little practical result, namely, the fact that chloride of silver was most sensibly acted upon by the blue ray, while the red and yellow rays produced comparatively little result. His experiments were repeated in 1801 by Ritter, of Jena, who discovered the existence of powerful actinic ray beyond the visible spectrum; and about 1802, Wedgewood and Sir H. Davy attempted the first practical application of photography, and published "a description of a method of copying paintings upon glass, and making profiles by the action of light upon nitrate of silver;" but although these and similar experiments appeared at the outset to promise so well, they were checked by the experimentalists being unable to discover any means of fixing the pictures so obtained. In 1814, M. Nièpce, of Chalons, discovered that certain resins were acted upon by light, in such a manner that they became hardened and insoluble. He coated a metal plate with a solution of bitumen, and exposed it to the action of the light; the parts acted upon became insoluble, and the parts representing the shadows were then dissolved out. Ten years afterwards he entered into a partnership with Daguerre, who, in 1839, published the details of the daguerreotype process upon silver plates, which, however, was not perfected until the subsequent discovery, by Goddard, of the accelerating action of bromine.

The fixing processes employed up to this time were very imperfect, and the matter was not set at rest until the publication of a paper by Sir John Herschel, on the use of liquid hyposulphites for fixing the photographic impressions. In 1840, Mr. Fox Talbot published a paper in the *Philosophical Magazine*, in which he gave directions for the production of both negative and positive pictures upon paper prepared with chloride of silver, and in February, 1841, he took out his patent for the calotype or talbotype process. To Sir John Herschel we were indebted for the first employment of glass plates to receive sensitive films, although he (Mr. Keith) believed it might, with equal justice, be attributed to Mr. Towson, of this town. In the present advanced state of the science of photography, it might be urged that all these processes are obsolete, but in them they might trace the germs of all the processes

at present practised. Without the knowledge of the different actions of the various coloured rays, we could not avail ourselves of the processes which required developement in a chemically dark room. The chloride of silver, the first substance experimented upon, was still used for nearly all the printing processes; and in the later discoveries of Daguerre and Talbot, we had the processes which depend upon the property which certain substances possessed of receiving a latent image, to be subsequently developed. In the bitumen process of Nièpce, and the chromotype of Ponton, we had the basis of carbon printing, and also the known processes of photoglyphy and photolithography. Having described the various kinds of apparatus employed by photographers, Mr. Keith proceeded to say, that the discovery in 1851, of the application of collodion to photography, might, he thought, be considered to commence the present era. The daguerreotype could not be applied with advantage to small portraits.

The talbotype was not sufficiently sensitive, and was, in addition, wanting in delicacy and fine detail, while the collodion was found in practice to combine the excellencies of all previous methods, and to possess besides some peculiarly its own. It had more rapidity of action than even Daguerre's process. It was applicable to pictures of a much larger size, and capable of almost unlimited reproduction; and it surpassed Mr. Talbot's, not only in sensitiveness, but also in superior descrimination of texture and minuteness of detail. There had been considerable difference of opinion as to whether Archer or Le Gray was entitled to the merit of the discovery. Le Gray certainly proposed its use in 1849 or 1850; but to Mr. Archer we were indebted for the first details of the practical mode of using it. The improvements since that time had been very rapid, and its extensive application might be inferred from the fact, that in a recent exhibition, out of 700 subjects, 600 were due to collodion. By its aid we were enabled to look upon the face, as it were, of all that was great, good, and noble, in this and other lands; the stupendous monuments of antiquity were brought to our own firesides. It really almost did away with the necessity of travelling. India, China, Egypt, Palestine, France, Germany, Italy, and Switzerland, had been ransacked, and we were no longer left in doubt as to the accuracy of the artist's pencil, for we knew that photography could not lie.

In considering the various uses to which photography could be applied, Mr. Keith gave some interesting instances of its practical value. During the building of the bridge of Kieff, photographs were taken every week for the information of the late Emperor Nicholas; in the Ordnance Survey Department of the Sappers and Miners, all the maps are reduced by photography, thus effecting a saving of about £2000 per annum; and it was also extensively used in the Royal Military Repository at Woolwich. In fact, there is scarcely a business or science to which photography might not render valuable aid. To the naturalist and botanist, how valuable must the faithful transcripts of nature be? To the astronomer it offers a ready method of mapping the starry firmament. Photographs of the moon had been taken, which showed very clearly the mountains and valleys which marked her surface; Jupiter, with his belts and satellites, had also been taken, and a series of very interesting experiments, to ascertain the comparative illuminating power of the various planets, had been instituted by, he believed, Mr. Warren de la Rue, and there was no doubt that our knowledge of the wonders of the celestial world would be materially increased by its use.

The transfer of the photographic picture upon stone or metal, for the purpose of ready and cheap multiplication, had occupied the minds of some of the greatest men of the day. M. Fizeau attempted to etch daguerreotypes with a mixture of nitric, nitrous, and hydrochloric acid. The white portions resisted the action of the acids, and the black portions were bitten in. It was then inked, and the surface covered with a thin film of gold, deposited by the galvanic battery. The ink was then dissolved with a caustic alkali, and the plate again bitten in either with acids or by being made the positive pole in a battery arrangement. Mr. Talbot patented, in 1856, a process for engraving on steel, in which he used a mixture of gelatine and bichromate of potash, subsequently improved and further patented in 1858. By his new process the plate was prepared as in his former specification. After exposure to light, an aquatint ground was laid upon it, and it was then bitten in with a solution of perchloride of iron. The photogalvanographic process of Herr Pretsch was capable of producing very beautiful results, although, from the number of repetitions, the cost was considerable. He also used the bichromate of potash and gelatine, but spread upon a glass plate. After exposure the plate was wetted, when the parts unacted upon swelled up sufficiently to admit of a mould being taken in gutta percha. This was placed in the battery as a mould, and copper deposited upon it, which served as a matrix from which the working plate was obtained. In a specimen recently issued by Mr. Greenwood, the process was still further lengthened out, by printing from the copper plate upon transfer paper, and printing from the stone. Photolithography had also its votaries. Mr. Macphearson, of Rome, coated the stone with a solution of bitumen in ether. Exposed to the light under a negative, the bitumen was rendered insoluble, and a wash of ether removed the unchanged portion. The latest and most promising process was that of Messrs. Cutting and Bradford, patented in the United States and England, which consists in preparing the stone with a mixture of gum-arabic, sugar, and bichromate of potash. It was then "lighted," and washed with a solution of soap, which attacked the stone, removing the coating, and fixing itself, or an insoluble soap formed by the mutual decomposition of the soap and the stone upon the stone, in place of the coating removed. Where the gummed surface had been entirely protected from the light, the gum was easily removed, and the soap had free access to the stone. The consequence was a thorough union of the soap with the surface. Where, on the contrary, the lights were strong, the gum having been rendered much more insoluble, was protected from the action of the soap, and at all intermediate points the effect of the soap upon the stone was inversely proportionate to the extent to which the gum had been affected by the light.

The uncertainty attending the old methods of silver printing had set many experimenters upon the process of carbon printing. Of these, two were before the public — that of Messrs. Salmon and Garnier, who prepared their paper with a strong solution of citrate of iron, exposed, and then applied the carbon, by means of a pledget of cotton wool; and that of Mr. Pouncy, in which finely-prepared carbon was mixed with gum-water and bichromate of potash. After exposure the unaltered carbon was washed out, but neither of these processes have yet produced pictures equal to the silver process. M. Sella and Mr. Perry had also brought out a process of printing, in which the picture was formed of the ordinary colouring matter of writing ink, gallate of iron. It had been improved upon by Mr. Hannaford, who had made public a proces of ink printing which promised well. He mixed albumen with bichromate of potash and ammonio-citrate of iron, with which he coated his paper. It was then exposed to the light, and after exposure washed in water to remove the unchanged bichromate. It was then immersed in a weak solution of ammonia, and afterwards in a weak solution of chloride of gold. It was then developed with gallic acid. Mr. Burnett had furnished us with a number of highly suggestive experiments in printing with the salts of cobalt, copper, uranium, and other metals, which would no doubt before long bring forth their fruit. As regarded the future of photography, he had not much to say. Its application to calico printing, and to all the arts and sciences, were numerous, and likely to become more so every day.

Professor Archer, though not a practical photographer, had been much surprised that manganese had never been used as a photographic agent. The effect produced by light on glass containing manganese was very powerful, rendering it a deep purple. In consequence of this, every particle of glass had had to be removed from the roof of the Chester railway station. Where the glass had been covered by putty it was found still unchanged.

Mr. Keith said, experiments were being made relative to this part of the subject, and so far they had been attended with very satisfactory results. In his new room he had employed glass coloured with cobalt, which had been found quite unchangeable under the influence of light.

Professor Elliot drew attention to some curious facts illustrative of natural photographic processes. In taking a picture to pieces which had been exposed to a strong light, he had found a perfect photographic impression of the subject imprinted on the panel underneath. Trout, it had been observed, on being transferred from one stream to another, accommodated themselves to the different colour of the water in the course of four or five hours. He had read some interesting remarks on this subject by the gamekeeper to the Duke of Buccleugh.

Mr. Foard remarked that it had been mentioned in *Notes and Queries*, and instances given in which trout had taken a photographic image of leaves, &c., with which they had been in contact while lying on the bank.

The Chairman thought this might be explained by the fact that the colour of the whole body of the fish had changed in dying with the exception of the parts which had been in contact with the leaves.

Professor Elliot said, still it was the action of light; but in the living trout the effect was more striking. In Scotland, on one side of a lake red trout would be caught, and on the other side black, and people supposed they were different species; but the difference was no doubt owing to the colour of the stones at the bottom.

Mr. Bell observed that there was such a thing as bottling-up light. Water absorbed a large portion of light, and it was very possible that being thus retained it might act powerfully upon the trout, and produce the changes that had been described.

Dr. Collingwood, in allusion to the specimens of chromo-photography which were said to have been produced, expressed his opinion that the future of photography was the taking of pictures in natural colours. The author of "Two Years Ago" had spoken very strongly on the subject.

Mr. Keith did not feel very sanguine as to this part of the future of photography. If the products of metals which in burning gave fourth coloured flames, such as strontian, sulphur, &c., were deposited by the galvanic battery on metallic plates, those plates might give the power of reproducing the same colours.

Mr. Bell had worked for many years with the daguerreotype, and had frequently had the plates with all the natural colours upon them; but with the slightest action of light, or a little increased vapour of mercury, they were all gone.

Mr. Foard considered it altogether an accidental circumstance. All such statements must be received with considerable doubt. It was easy for those who were not very correct in their observations to make mistakes of this kind. Persons had come to him, and told him they had succeeded in producing a blue sky, which was nothing more than a defect in the picture, occasioned by decomposition under the action of light. Others believed that they had produced green foliage; but these effects

were not at all to be attributed to the pictures being transferred in their natural colours.

Professor ARCHER spoke of the effect produced by placing in the dark two highly polished silver plates, one engraved and the other not. The result would be, that the engraving would be transferred to the unengraved plate, which, by being exposed to the fumes of iodine or bromine, would exhibit a picture having all the character of a photograph. This experiment had been produced by our own countryman, Möser, to show the effect of latent light.

The CHAIRMAN asked what was supposed to be on the surface of the unengraved plate to produce the effect?

Mr. BELL would call it a film of light.

Professor ELLIOT, speaking of photographs of the moon, said, it had struck him as possible that another curious result might be attained by the employment of photography in connection with astronomy. There might be stars giving out only actinic rays, and, consequently, not visible by our present means of observation; but by presenting to them different coloured plates, they might be discovered.

In reply to an observation by the Chairman,

Mr. KEITH said, many substances besides cotton had been used for the purpose of producing collodion, but none appeared to answer so well. It was an interesting fact that Mr. Hardwich, in the last edition of his "photography," stated that cotton was the material first tried, and after experimenting upon many other substances, he had come back to cotton.

Professor ARCHER said, the experiments had proceeded in a wrong direction. Instead of going from a finer to a coarser substance, the object should have been to go from the coarser to the finer. There was silk-cotton and various other products, which were too fine to spin, because they had not that ridge on the edge of the fibre which cotton had, and consequently they would untwist again; but they would probably answer admirably for collodion. They were very cheap, and easily obtained; they were almost all finer than cotton, and transparent, which cotton was not. Consequently, they were well worth experimenting upon.

Mr. BELL said, what was wanted was something that the ether would take up without leaving a residuum.

The thanks of the Society were voted to Mr Keith.

Exhibition.

MACCLESFIELD PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Exhibition of Photographic productions which was noticed in our number for January 1st, as being about to be held in connection with the Macclesfield Society, has since taken place. We then observed, that the Society thought well not to occupy a thoroughly independent position, but to join another institution; and although this course involved some inconveniences, as for instance a considerable curtailment of the time allowed for viewing the pictures, yet under the peculiar circumstances of the case, it appears to have been the best, and indeed the only one that could have been pursued.

The opening took place on Monday, the 17th of January, and although it had been intended, in the first instance, to continue the Exhibition for two or three weeks, it was found necessary to bring it to a close on the evening of the 21st ult. A good deal of local interest appears to have been aroused, and by the assistance of the catalogue of the photographic department, we are enabled to place the more noteworthy features of the collection before our readers.

It was hardly to be expected that a new Society, entirely free from patronage, and only depending on the energy of workers and that liberal spirit which characterises the followers of our art, should have been able to collect into its first Exhibition much that should be new to the photographic world; even though its aim was not so much to test the progress and photographic status of its own members, as to give them and their townsmen an opportunity of judging, by comparison, of different processes, and of the present capabilities of the art when skilfully employed. Accordingly, we are not surprised to meet again with the often-shown but not on that account less beautiful sea and cloud pieces by Le Gray, Nos. 136, 146, &c., whose *Fortifications of Brest* (155), and two pictures of *Brest Harbour, with French and Russian Fleets* (182 and 184), are also not less excellent.

The Society of Arts contributed about thirty pictures, upon a varied range of subjects, many of which afforded ample materials for study.

Mr. Fenton's series of *Views from Welsh Scenery* was well represented; though we are informed that it was found impossible to show all that were contributed, some strikingly beautiful ones being brought forward for the first time for the inspection of the Society at its February meeting. Of those exhibited, perhaps *Pont-y-Pant* (185), and *Miner's Bridge over the Llugwy* (158), may be named as the most striking.

Of photographs of paintings, engravings, &c., we may note a number from pictures in the late Art Treasures Exhibtion at Manchester, contributed by Mrs. Legh, Lyme Hall, being Nos. 93, 98, 118, 120—3, 125, 129, 132, 133, 152; a large frame of beatifully copied engravings (22), by Mr. A. Brothers, Manchester; also a copy, *The Three Apostles* (56), by Mr. F. M. Mercer.

Another series of *Welsh Views* were contributed by Messrs. Mudd, Manchester, of which Nos. 41, *Pont-y-Lledr*, and 38, *A Mill near Trefriw*, elicited general commendation; the former from the beautiful rendering of the gradations of distance, the latter from its artistic effect. No. 41, *Pont-y-Pant*, however, contributed by the same gentleman, was less effective than Mr. Fenton's picture taken from the same point. We may also make honourable mention of Mr. Osborne's *Views of the Interior of Aston Hall, near Birmingham*; of *Carnarvon Castle*, from a negative by Mr. W. Jackson (84); and especially of the *Views of Whitby Abbey* (Nos. 134 and 139), from negatives, by Mr. W. Pumphrey, York.

Of views of local interest, chiefly contributed by the Society's own members, the best were—*Old Moreton Hall, near Congleton* (106), the negative by Dr. Hill Norris's dry process; and *Chorley Hall, Cheshire* (45,) by Messrs. Mudd; as well as several very beautiful scenes from the neighbourhood of the Earl of Shrewsbury's seat at Alton, contributed by the Rev. W. F. Ribbans, of Leek, and printed by developement from waxed-paper negatives. The pictures of *The Fountains* (92 and 102), speak well for the capabilities of this process.

There were also good specimens in stereoscopic views and copies from statuary, but none calling for notice from us. In portraiture we observe a copy, enlarged with good effect, by Mr. John Eastham, of Manchester, from one taken in India, of Captain Stanley. Many other specimens were also not without merit.

If there be such a thing as antiquity in photography, we fancy it is approached by No. 1 of the collection, a talbotype print of *The Seine at Paris*, contributed by Mr. Wilson, of Preston; and ample means were afforded for appreciating the progress which the photographic art has made since these were the order of the day, by inspection of the photoglyphs by Fox Talbot, 74 and 75, the photogalvanographs, 165, &c., and the new carbon prints by Mr. Pouncy, Nos. 85, 89, &c., one of the latter of which, an *Abbey View*, was minutely criticised in one of our recent numbers.

We cannot but regret that the Exhibition was so speedily closed; but doubtless the Macclesfield Society will have learned much by this their first lesson that may be of use to them in future years: all that we have to do, therefore, is to encourage them to make progress, really and not pretentiously, in the path which they are already treading.

Letters to a Young Photographer.

No. V.

MY DEAR EUSEBIUS,

Who shall decide when doctors differ? Photography has as many knotty points as medicine, and the ways of unravelling them both are devious and uncertain. In my communications to you I carefully avoid speculative suggestions, and endeavour to limit myself to the fruits of my own experience. You say you find much discrepancy in toning and fixing processes: we have to modify our practice by experience. Experience has clearly shown to me that the toning bath made according to Mr. Hardwich's original formula, is unsafe if used after the gold is eliminated from it by more proofs than it can colour. When this condition arrives, the proofs are toned by sulphur instead of gold: hence their instability. It is a mere matter of calculation how many proofs of a given size a given quantity of chloride of gold will tone. Every picture 9 × 7 consumes about one grain of chloride of gold in the process of toning, and yet, when one such picture is burned in a crucible, the residue yields only 0·12 grain of chloride of gold, showing a loss of 88 parts out of every 100 employed. This fact shows the necessity for looking after the residues of baths, washings, &c. Now, the quantity of so expensive a commodity as chloride of gold required for toning, induces amateurs to pursue a false economy; and they frequently continue to use a bath long after all the gold is abstracted, being satisfied with their proofs becoming coloured, no matter how. Herein lies the danger and uncertainty of the compound toning and fixing bath. If it be allowed to stand exposed to the atmosphere a few days undisturbed, the gold may be observed floating on the surface in a bright metallic film, showing complete decomposition; and still such a bath will tone as well as ever. The de-

teriorating influence of this decomposed bath upon proofs toned in it, is thought to be due to the presence of free acid, which liberates the sulphur from the hypo, and toning the proofs by converting the chloride of silver into the sulphide of that metal. Now, to show you that sulphur-toned prints are not entitled to sweeping condemnation, I may as well tell you at once that I have toned and fixed many hundreds of proofs by sulphur alone, without the use of chloride of gold at all. I proceed in the following manner:—

I first wash my proofs to remove the free nitrate of silver, and then immerse them for about half an hour in a bath of hyposulphite of soda, of the strength of sixteen ounces of hypo to five pints of water. Upon removal from this bath the proofs are carefully rinsed, and then placed, for a few seconds, only in the following:—

Water	40 ounces.
Hyposulphite of soda	9 drachms.
Sulphuric acid	36 minims.

Stir the mixture with a glass rod; it soon becomes milky and disengages the odour of burning sulphur. The washed proofs are immersed in it, one at a time, and very carefully watched. The red hue quickly disappears, and violet, purple, and black tones supersede each other in rapid succession; but as the tones are much deeper when the proofs are dried, they must be removed before they acquire that depth of tone it is desired they should ultimately possess. When taken out of this bath, the proofs must be immediately immersed in clean water and well rinsed. The only precautions to be taken in adopting this method of toning are, to strictly limit the quantity of sulphuric acid to the proportion of hypo indicated; and not to allow the proofs to remain an instant longer in the bath than is necessary to impart the desired colour. The bath soon loses its property of toning, and proofs immersed in it after it has been prepared for an hour, become yellow and grey in the lights and shadows. This method is as sound in theory as it is good in practice; but I shall not afflict you with philosophical explanations at present. You may take my word for it, that proofs toned in this manner are just as brilliant and permanent as those toned by any other process in general use, and are moreover quite undistinguishable from those toned in the ordinary gold bath. I have no idle fears in the employment of acids in the process of toning, the point to hit is to apply it at the right time.

When we employ separate baths for fixing and toning there is but little risk that the proofs will be toned by sulphur instead of gold. You may easily discover when the bath is exhausted of its gold. In the bath composed according to M. Bayard's formula, decomposition sets up in a few days if the solution is left exposed to the air, the gold floats in a thin pellicle on the surface; but I obviate this inconvenience, by keeping the bath when not in use in a bottle filled up to the stopper the atmosphere being excluded, the liquid is preserved unchanged. I do not think it necessary to lay much stress upon the advantages of an alkaline bath; it is certainly safer than an acid one; the danger appears to consist in the liberation of free acid in the presence of so unstable a compound as hyposulphite of soda. And yet this would appear to be contradicted by what takes place in the method by acid hypo indicated above, when sulphur is set free and does the work of toning. The danger may be in the protracted time of immersion; for this method requires but a few seconds contact with the free acid and sulphur. I have found its quick action very advantageous when there has been many proofs to tone at one time; and although there may be a great consumption of hypo, there is a corresponding saving in time

Photographic Glossary.

Dry Collodion Process — A modification of the ordinary collodion process, in which the sensitive film is exposed in the camera in the dry state. It is sometimes confounded with *preservative processes*, from which it differs somewhat, as the object of some of the *preservers* is to keep the collodion in a moist condition.

Dynactinometer — An instrument invented by M. Claudet for measuring the intensity of the actinic power, and for comparing the relative quickness of lenses.

Efflorescence — Certain salts, such as sulphate of soda, when exposed to a dry atmosphere, part with their water of crystallisation, and fall into a state of powder, or effloresce. Others absorb moisture from the atmosphere, and become liquid; these are said to *deliquesce*.

Elliotype — An application of the property possessed by chloride of silver of darkening by exposure to light. It cannot be called a photographic process, as it acts without the use of the camera. A painting is made in transparent and opaque body colours upon a piece of plate glass, which is then placed in the ordinary printing frame, and pictures are obtained which may be produced in outline or in *chiaroscuro*, and are fac-similes of the drawing. This invention is guarded by a patent!

Engraving — Heliographic engraving consists in the preparation of a sensitive surface on a steel, copper, or zinc plate, or on lithographic stone, which, when acted upon by light, allows an etching or inking effect to take place, so as to admit of impressions on paper being taken from the plate or stone, as when they are engraved in the ordinary manner. Various processes have been invented by Mr. Talbot, M. Poitevin, Herr Pretsch, Mr. Newton, and others, for full details of which see various articles in the pages of this *Journal*.

Energiatype — A photographic process possessing very great sensibility, invented by Mr. Robert Hunt, which is better known under the name he has substituted for it — *Ferrotype*.

Ethers — Ethers are named after the acids by whose action on alcohol they are produced. When ether is prescribed in photography, sulphuric ether is indicated. There are nitric, acetic, hydrochloric, oxalic, and other ethers. Sulphuric ether is a very volatile, fragrant, colourless, combustible fluid. Its vapour is exceedingly heavy; it may be poured from one vessel into another like water; it forms a very dangerous explosive mixture when mingled with atmospheric air and ignited, and should be handled with extreme caution in the presence of an open light. Ether is extensively used in photography as a solvent of gun-cotton in the preparation of collodion. The specific gravity of pure ether at 60° is 0·724. The chemical expression for ether is oxide of ethyl. It is of the same composition as alcohol, minus one equivalent of water.

Equivalents — Chemical equivalents are those relative quantities in which bodies combine to form new compounds. All substances combine with each other in definite proportions, or in multiples of a given number, thus the proportion in which oxygen unites with other elementary bodies is 8, or its multiples, 16, 24, 32, &c. The equivalent of sulphur is 16. When this quantity of sulphur is combined with two equivalents of oxygen, 16, there is produced one equivalent of sulphurous acid (32). When the same quantity of sulphur is combined with three equivalents of oxygen (24), one of sulphuric acid is produced (40), therefore the numbers 32 and 40 respectively, are the equivalents of sulphurous and sulphuric acids. These equivalent numbers may represent any given quantities, such as grains, ounces, or pounds, so that the proportions continue the same. The law of combining proportions is as important to the chemist as the loadstone is to the mariner.

Foreign & Colonial Correspondence.

Paris, February 22, 1859.

THE time for receiving photographs intended for our next Exhibition is fast approaching, and will extend only from the 1st to the 15th of March. I hope, therefore, that your readers will bestir themselves, and not allow their pictures to arrive here too late, as happened to many on a previous occasion. The Exhibition will continue open from the 1st of April until the 15th of June, and rumour is already very busy in announcing what gems of art and evidences of industry we may expect to behold. There would be some advantage resulting to the Committee of the Exhibition if artists would at once notify them of the pictures they intend to send, without waiting until they are actually despatched. A concession has just been made in favour of foreign exhibitors, whose productions will be received twelve days later than those of native artists— that is, up to the 27th of March — provided notice be given prior to the 20th proximo. The names of the jury include many of the most distinguished professors and amateurs of photography; and, as it may interest you to know them, I will enumerate them here:— There is the Count Aguado, M. Bayard, Bertsch, Cousin, Delessert, Davanne, Foucault, Hulot, Jean-Renaud, Lemaitre, Count Leon Laborde, Le Gray, Moreau, Peligot, and Robert, besides the officers of the French Photographic Society. I must explain, that all the names enumerated are not photographers, but some are artists, and

others are scientific professors. There is a good mixture of varied talent, that must go far to secure a competent and impartial jury.

At the last meeting of our Society some proofs were exhibited, sent by M. Asser, of Amsterdam; but as he does not communicate his method of producing them, I can only notify you of the fact of their appearance. M. Brebisson explained his method of carbon printing, which includes some points worthy of notice. He prefers to make use of a highly glazed paper, floated on a mixture of bichromate of potass and gelatine. This paper, although kept in the dark, will not preserve its sensibility longer than two or three days. The gelatine appears to lose its solubility, and the proofs taken on it lack vigour. The exposure in the pressure-frame he states to be required is one-fourth more than given to paper sensitised with chloride of silver. The proof is removed as soon as the deepest shadows come out of a light red colour. We must not wait for the appearance of the half-tones and minor details. Taken into a dark room, the proof is fastened at the corners by gum to a glass plate, and then the powder is dusted over it with a piece of cotton wool. He employs blacklead, lamp black, or red chalk, all in a state of impalpable powder; but he prefers a black pigment prepared by M. Delahaye, which I suspect to be the fine carbon produced by the combustion of coal gas. When the black is spread evenly over the surface of the proof by means of a slight friction, the sheet is placed blackened side uppermost in a dish, and a stream of boiling water poured over it, gently agitating the dish. The water dissolves the greater part of the bichromate of potass. A fresh quantity of water is then poured over the proof, so as to clear the picture: this operation must be performed with a soft brush, or a pencil may be made with a piece of fine muslin rag. The layer of gelatine unacted upon by the light is easily removed; but this operation is very delicate, and must be guided by the nature of the design, so as not to remove the delicate parts by too much friction. If the exposure has been too prolonged, the adherence of the carbon is diminished, and the deep shadows will have a disagreeable red tint. On the other hand, if the exposure has been insufficient, the gelatine comes off in large flakes, and the picture loses its chiaroscuro. A cloudy but light sky is is more favourable to exposure than strong sunlight. It will be remarked of this method that the carbon is applied to the gelatine after exposure to light. A complicated machine for cleaning glass plates, invented by M. Richardin, was exhibited. It will admit of as many as five hundred plates being cleaned with it in one day; but, from its dimensions and complexity, it must be regarded in the light of a curiosity.

I have seen a stereoscope constructed with a double frame at the part where the picture is placed, for the admission of pieces of coloured glass, which impart a tone of colour to the transparent slides. Our photographic world is very much astonished to find the reasearches of M. Nièpce so coldly received in England, being, in fact, almost ignored. They console themselves by thinking, that as the sun seldom shines upon London, no opportunity has occurred for repeating the experiment of storing up light. M. Nièpce lately invited Mr. Wheatstone to his laboratory to witness the experiment of producing a photograph by the agency of light stored up in a tin canister. Mr. Wheatstone accepted the invitation, when M. Nièpce took a piece of card, previously impregnated with tartaric acid and rolled up since last June, in a tube hermetically closed. In company with Mr. Wheatstone, M. Nièpce proceeded to a dark room: he then took a piece of paper sensitised with nitrate of silver, upon which he placed another to serve as a positive, merely a piece of paper inscribed with large characters; he then opened the tube held vertically, with the open end downwards, then placing this orifice upon the positive which covered the sensitised paper, and left the tube in this position for about ten minutes, then removed it. The paper became blackened in a circle in the parts corresponding with the opening of the tube, and the letters of the positive were distinctly traced in white on a black ground. Mr. Wheatstone will take some specimens with him to London, and exhibit them there. J. P.

Geelong, Australia, Dec. 14*th*. 1858.

I HAVE been making some experiments with an old plan of Fox Talbot's, which he used for paper, and which is, I believe, in his first specification, but I have never heard of its being applied to collodion; it is to produce a positive instead of a negative by the first operation in the camera.

I took a positive collodion and prepared the glass plate in the usual way, and after immersion in the bath, well washed it and exposed it for half-a-minute to the direct light* of the sun (if now developed it would blacken all over). I then take a solution of iodide of potassium, thirty grains to the ounce of water, and let it flow over the plate several times, returning it to the bottle, expose in the camera, and give it rather longer than usual that the light and hydriodate may *bleach* the part previously acted on by the light.

* It may be exposed first and washed after.

I now return to the dark room and well wash the plate under the tap, immerse in the bath and drain, then pour on the positive iron developer, when the picture comes out as a transmitted positive (negative superficially), and from it any number of negatives can be made.

Sometimes, however, I find the bleaching has not acted enough, and a negative is produced. Here is a wide field open to us to find the quickest bleacher; this will perhaps surpass in celerity the quickest exciter.

I have made several experiments on varnishes for positives. I have used Mr. E. T. Hobson's and Mr. Maddison's, and find Maddison's the best, but his recipe makes it too thick and it cracks; it is better made thus:—

In a two ounce bottle, put

Gum Juniper .... $1\frac{1}{2}$ drachms.
Gum Thus .... 1 drachm.
Fill up with spirits of wine.

It will now be plenty thick enough; it is much whiter and brighter than Mr. Hobson's. The plate must be warmed before it is applied or it chills.

I expect that from five to ten grains of mastic would bind it and prevent it cracking, this being a soft gum and used as a binder by varnish makers; but the above I have tried and it answers. I have found out a varnish that protects the positive picture from air and water, and is *invisible*, slightly improving the blacks by cleaning them, the whites *not* turned grey or altered (the picture can be tinted first), then the skies and draperies coloured (dusted in) in *dense* colour (it is highly adhesive), or painted in oil if required on *it*, and it will have the appearance of an ivory miniature in a remarkable degree (no spots ever occur). It can then if required by the customer be made vitrious by the use of the ordinary white varnish. I have sent the recipe to my wife, Mrs. Sparke, 50, Chapel Street, Devonport, and if any of the trade likes to arrange with her they can bring it out. I have tried long to get it, as the small quantity of free nitrate, or cyanide of silver, after a time absorbs water and produces black spots in our strong light here.

A. K. SPARKE.

Jersey City, New Jersey, United States of America, January 20*th*, 1859.

CAN you, in the plenitude of your wisdom, or from the abundant sources of information you have access to, inform me if any of the *bromides* were used in *collodion* previous to July, 1854? This question is of the gravest importance to all the photographers of the United States of America. You are aware, that a patent was granted to one Cutting, of Boston, for improvements in photography, one improvement being the use of *bromide of potassium* in the collodion. This patent has been tried and sustained in a court of law; not, however, by argument but by default, the defendant choosing rather to pay a penalty than litigate the matter.

Now it does appear monstrous that after the liberal manner in which both English and French philosophers have given their discoveries in this art to the world, a man in the United States of America should be so lost to generosity as to trammel the art by patents for what may fairly be doubted he ever discovered.

I need not ask you to aid our fettered art. I am sure your heart is open to every solicitation, and that you will set the ball in motion to gather as it rolls the information required.

Who was the first to use bromide in collodion? or was it used previous to July, 1854?

W. CAMPBELL.

[The evidence is as clear as daylight that bromides were used *before 2nd June*, 1853, as on the evening of that day papers were read at the Photographic Society (at the Rooms of the Society of Arts, Adelphi, London), one by Sir John Herschel, *On the substitution of Bromine for Iodine in Photographic Processes*; and a second by Mr. Crookes, in which he details the results of experiments he had made with *bromised collodion*, in consequence of the suggestion of Sir J. Herschel. Mr. J. B. Hockin, of Duke Street, Manchester Square, London, is stated to have made the collodion alluded to by Mr. Crookes. These papers were *published* 21st June, 1853, in the *Journal of the Photographic Society*, pages 70 and 71, and in the succeeding number for 21st July, 1853, Mr. Crookes published, page 86, a formula for the bromised collodion which he had employed.—ED.]

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, George Shadbolt, 2, *Upper Hornsey Rise, London, N. All* Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

Correspondence.

TONING, &c.

To the Editor.

Sir,—I was very much pleased to see in your "Letter to a Young Photographer," a recommendation to use M. Bayard's mode of toning, for strange to say, I picked it out to tone some prints I was about to present to our Society's folio, and in your report you will read the opinion of our members with regard to their *tone* and sharpness; it was what I am fond of—an experiment, and I am glad to find my choice backed by yourself. I am told that it is but a neutral bath, and not *alkaline*, what do you say? Do you think it permanent? It is certainly very quick and simple, and I find that if I fix or finish the prints in a new hypo and gold bath, I obtain even finer results; will this, in your opinion, affect their permanency? How long do you find that you can keep the bath in working order? I find after two days a red prismatic scum covers the surface, and indelibly stains a print where a particle touches it. There is, I think, a large proportion of gold in it, and should tone more than an amateur can do in two days, otherwise it is not an economical toning bath.

I should be glad of your opinion and assistance in your next on this matter, as many of our members, after seeing my pictures, are trying it. Would you also kindly inform me where I may find a description *(practical)* of card-board backs for holding dry plates; for a long journey they would be lighter and cheaper than the wooden ones. Can they be purchased? I am, yours, &c.

Manchester, February 16*th*, 1859. JOHN L. DAVIES.

[The article mentioned is not our own, but from the pen of a co-adjutor, a practical hand at photographic printing. The bath is not *alkaline*, and the red hue first produced on mixing the ingredients is indicative of the presence of free acid, or at least of a compound, acid to test paper. The permanency of the prints we should consider unquestionable if toned in a *new* bath, but problematical in an old one. The scum is an indication of the bath being exhausted. See our leader, also Mr. Forrest's letter in the current number.—Ed.]

CARDBOARD BACKS, &c.

To the Editor.

Sir,—I noticed in your last *Journal* a letter from Mr. Jesper, claiming for Mr. Osborn, of Birmingham, the credit of inventing card-board slides for cameras. If you will refer to THE *Journal* for 1854, you will find I brought forward the same thing five years ago, and that Mr. Atkinson of this town made card-board cameras about the same period.

An improvement has been made in my slide by my friend Mr. Hooper, of Manchester. I send you both plans for inspection, and take this opportunity of sending you several communications I have received from him on the turpentine waxed-paper process, with illustrations. He is so throughly practical in all he does, that I am confident my brother photographers will find his statements to be exactly correct. The portability of waxed-paper is certainly greatly in its favour.—I am, yours, &c.

Liverpool, February 18*th*, 1858. J. A. FORREST.

GOOD TASTE.

To the Editor.

Sir,—I have just now read, in an over-the-sea contemporary of yours, a bitter attack on you, on sundry grounds, but primarily because you have seen fit to modify the title of your periodical. What, however, I especially remark in the article in question, is his daring impertinence in calling your "good taste" and "gentlemanly courtesy" in question, as if he possessed the smallest share of those qualities himself, or had any idea what constituted either the one or the other. Anybody who happened to read the unwarrantable personal attack he made on the editor of a contemporary in his paper, a little more than a month ago, will have formed an opinion of his taste and courteous feeling not likely to be effaced; and it is absolutely disgusting to find such a man presuming to lecture another on the want of qualities of which he himself can have no more conception than a Gorilla.

What makes his attack on the gentleman I have mentioned still worse, is the fact, that he not only published a letter from a man boasting that he had by a falsehood successfully imposed upon the former, but headed it by some observations of his own, proving that his moral perceptions were as blunted as those of his correspondent.

As a specimen of what this individual considers "good taste," I quote a passage from the last number of the periodical under his direction. After enumerating a lot of articles, which he chooses to call novelties, he goes on—"We (I) shall always be happy to back the efforts of any firm in bringing forward a useful novelty, by calling attention to it in this Journal—*provided always that a specimen of the article be forwarded for our inspection.*"

Begging that you will do a constant reader of your Journal the favour to publish this letter, I beg to subscribe myself as

A HATER OF PERSONALITIES.

RE BOTTLE DIAPHRAGMS.

To the Editor.

Sir,—Southey has written in his "Doctor" a motto that I would commend specially to photographers—

"May my candle go out in a stink if I refuse to confess from whom I lighted it."

I have no desire to discourage the *revival* of old inventions *acknowledged as such*, which certainly may be useful, or to render any amateur accountable for all that has been done or invented in the subject he takes up as his hobby, and still less do I expect him to read all that has been written on this particular pursuit; but I would simply suggest a little research.

The above diaphragms, claimed by Mr. Ross, were invented by Martin, of Paris, for obtaining clouds in his panorama camera, one of which I purchased certainly twelve years ago.—I am, yours, &c.

222, *Regent Street.* W. E. KILBURN.

[We are always glad to have an opportunity of rendering credit to the originator of any thing useful, and thank our correspondent for his intimation; but, at the same time, we must express our conviction, that Mr. Ross was equally an inventor of the arrangement. We had never met with it before, and it is, therefore, not at all surprising that it was unknown in the United States of America.—Ed.]

MAGIC LANTERN SLIDES.

To the Editor.

Sir,—Being desirous of obtaining information on the following, of a reliable character, I take the liberty of requesting replies in your valuable Journal—

1st. Wanted, formula for the best negative process for portraiture, including collodion.

2nd. Wanted, formula for the best process for the production of magic lantern slides.

3rd. A friend of mine recommends the introduction of a small piece of nitre into the developing solution for positives *on glass*, for the production of brilliant whites. Do you think it calculated to effect the object? If so, what quantity will answer?

4th. Wanted to know how to prepare paper positives for the reception of oil paint; also, please inform me the diameter of quarter, half, and whole plate lenses, and oblige, yours, &c. R. T. W.

Liverpool, February 10, 1859.

[1. For this we must refer you to Hardwich's *Manual of Photographic Chemistry*, or to Horne and Thornthwaite's, Hennah's, Squire & Co.'s, or Bland & Co.'s shilling pamphlets. It would take far too much space to reply to this query in detail.

2. Any of the dry processes will give this desideratum, or you can copy from a negative in the camera. Remember, however, that in any case the pictures should be slightly *over-exposed* and *under-developed*, to give transparency.

3. Yes. Protosulphate of iron fifteen grains, water one ounce, nitrate of potash (nitre) ten grains.

4. Immerse the proofs in a solution of isinglass, three or four grains to each oz. of water; the solution should be quite warm—hang up to dry.

You do not state whether you mean portrait or landscape lenses; but in either case there is no *definite* size for the diameters; the size of picture depends more, but not solely, upon the focal length of the lens.—Ed.]

PRINTING DIFFICULTIES.

To the Editor.

Ssr,—Allow me as a reader of your *Journal* from the first, to trouble you for aid in some photographic difficulties. As I pursue this art only for pleasure, I have been too ready in following the recipes of various operators, only to spoil my chemicals.

I take much pleasure in the printing of positives, using albumenised paper, say 10 grains chloride of ammonium, and nitrate of silver 60 grain solution, three drops of acetic acid to each ounce of the latter; but of late my views have been rendered doubtful by a communication in your last No., addressed to a Young Photographer, recommending 5 per cent. of the chloride of ammonium, and that no acetic acid be added to the silver solution.

As I understand, 5 per cent. is ten grains of a chloride to a fifty-grain solution of silver, also that the addition of acetic acid to the silver solution tended to keep the whites of the print pure. Your opinion is earnestly wished for on these points:—

1. What is really the best chloride, sodium, barium, or ammonium, for salting albumenised paper?

2. Is 5 per cent. ten grains to fifty-grain silver solution?

3. Is the addition of acetic acid, say three drops to the ounce of the nitrate of silver solution, advisable or not?—I am, yours, &c.

Glasgow, February 9*th*, 1859. DOUBTFUL.

[Chloride of sodium for albumenised paper is that which we prefer, but for the plain paper, chloride of ammonium. 2. Five per cent. of chloride means thirty grains to the ounce of albumen, or albumen and water. If the albumen be *undiluted* we think twenty grains enough, as the film will be thicker. The letters you name are written by a skilled practical photographer. The per centage is not intended to apply to the sensitising solution. 3. The addition of an acid to the silver bath *retards* the action of the light, but otherwise does no harm. If the lights remain pure without it, leave it out; but some kinds of paper imperatively demand it, owing to an impurity in the manufacture.—Ed.]

VALLANTIN'S LENSES. TONING PROOFS.

To the Editor.

Sir,—In the last number of *The Photographic Journal*, a correspondent wished for your opinion of "Vallantin's" Lenses, of which you had not heard. Having tried several, I find them all that can be desired; they quite equal Lerebours, and have the advantage of being much cheaper. Mr. Bolton, of Holborn Bars, is the agent.

I differ from you respecting Hardwich's toning process; the prints should be slightly over-printed, as the toning bath reduces them a little, and if *not* sufficiently toned, they will lose considerably in the hypo, which I think one cause of "Dublinensis'" failure, and the lights not being clear was owing to the paper having become discoloured from keeping before it was toned.—I am, yours, &c.

Islington, February 9th, 1859. D. W. HILL.

COVERING MICROP-HOTOGRAPHS.

To the Editor.

Sir,—You have always shown in your *Journal* such great liberality in making known your methods of micro-manipulation, that I am induced to ask you to favour me in your next number, with the best method of fixing the small glass disc upon the micro-photograph. My plan has been, to dilute the Canada balsam with an equal part of spirit of turpentine, then drop from the point of a pin one drop over the photograph, and bake for some time on a copper-plate over a spirit lamp. The objections to this plan I find to be—

1. If not baked long enough, the disc does not set firm. If too long, it discolours the photograph, and air bubbles appear underneath.

If this is the only method of doing it, how am I to know the exact time to allow, or is there a better mode?

2. What is the best material to employ, in order to clean large plates that have photographs upon them, that have been varnished with the American ambrotype varnish.

3. What do you consider the best developer for very small locket portraits, for giving firmness combined with density?

Trusting you will not consider I am taxing your kindness too much,

I am, yours, &c. VERITAS.

London, February 8th, 1859.

[1. You can procure Canada balsam sufficiently fluid for the purpose of mounting without the addition of turpentine; it should be about the consistence of molasses. It is better without than with the turpentine, though the latter can be used. Proceed thus:—take a spirit-lamp, and cut the wick *very short and conical in form*, which will cause it when lit to produce a short small blue flame, which consumes but little spirit and is very manageable. Hold your glass slide over the flame and in contact with it, so as to flatten out the flame a little, and keep the glass moving in a circular direction so as to warm about a *circular inch* of the glass, otherwise it will probably break: the heat should be about as hot as can be borne by the back of the hand without flinching, *then* drop from a pin a little of the balsam, and allow it to evaporate until nearly solid, warm the *thin* glass over the flame and apply it to the balsam, not flat, but a little slanting; it will generally settle itself at once and drive out any bubbles of air, but if any be enclosed, a little heat cautiously applied by the aid of a spirit-lamp will drive them out.

2. We do not know the varnish you mention, but expect that soaking in solution of soda and water for a few days will soften it. Try also benzole as a solvent.

3. Do you mean for positives or negatives? If the former see answer to *R. T. W.;* if the latter, pyrogallic acid three grains, citric acid one grain, water one ounce, at this time of the year; but in Spring use two grains of the pyrogallic acid instead of three.—Ed.]

COLLODIO-ALBUMEN PROCESS.

To the Editor.

Sir,—As I find I am not up to the mark in the collodio-albumen process, I shall be glad of your valuable assistance—that is, if you think a reply to this will be useful to others as well as myself.

1. In several formulæ for the process, I have seen a large quantity of glacial acetic acid recommended in the baths. I should like to know if this is necessary, and why?

Mr. Robinson, in the *Journal of the Photographic Society* for May, 1857, recommends only one minim to the ounce of bath, and only uses one bath; and he says in the same Journal for July, that his bath is, after six months' use, as colourless as when first made.

2. I scarcely understand Mr. Riley's letter, in your Journal of July 15. Does he float the plate with uniodised albumen? and if so, is it better than if iodised? and are the pictures as good as by the old process, as they seem to be taken in a deal less time?

3. I think if you would give a formula that you know to be good, it would be useful; and, for my own part, I shall be glad of any advice on the subject you please to give. If there is anything in back numbers, please say in which, and I will get them, as I have only been a subscriber since June last.

4. I should like your advice respecting the buying of a half-plate portrait lens; I want one to take landscapes as well. Do you think I may reasonably expect the front lens to take pictures 9×7 good to the edges? Are French lenses worse than English, as I find they are sold for less? I shall be obliged for any information on the subject you please to give.

I am, yours, &c.

Bakewell, Feb. 9, 1858. WILLIAM HOUSLEY.

[1. The acetic acid is intended to prevent discolouration of plates in darkness.—Mr. Robinson is, however, a skilful photographer.

2. Uniodised albumen. Two specimens exhibited to us by Mr. Riley were very good. We have some doubts, however, about the length of time his plates would keep before being exposed.

3. You will find in our volume for 1857 full particulars, at pages 58, by Mr. Sidebotham; 137 and 145, by Mr. Ackland; 209 and 222, by Mr. Draffin.

4. You cannot have a landscape and portrait combination in one, without sacrificing some excellence in one capacity. We could not, with fairness, recommend any particular maker, but may safely say, that as a *rule*, English lenses are better than foreign ones; but this is by no means without exception.—Ed.]

ANSWERS TO CORRESPONDENTS.

Wilhelm — We have carefully examined the photographs, by the late Robert Howlett, to which you allude, taken with the orthographic lens, and certainly must admit that they are as sharp and perfect as can possibly be desired, but we have no means of knowing the size of the aperture employed.

T. B., Leeds — For information about Vallantin's lenses, see letter of John Spencer, in our last, and D. W. Hill, in the present number.—Those of Derogy we have never tried, but we examined one recently at Glasgow, and were informed that it worked satisfactorily. The bayonet joint, instead of a screw, we like; but some sort of *spring* is wanted to prevent a slight amonnt of "shaking" at present existing.

K. B. B. — Chloride of lime is a misnomer, as there is no such chemical compound; the substance known by that name is simply lime, impregnated mechanically with chlorine gas. The compound would be chloride of *calcium*, the metallic base of lime.

One in a Fix — Like many others who use dry plates, you have forgotten to add some nitrate of silver solution to the developer before pouring it on to your plate, and, consequently, there is nothing to form the expected picture — "*ex nihil nihilo fit*." Remember that the picture is formed out of the nitrate of silver alone, by the agency of the insolated iodide, and as dry plates have the nitrate washed away, it must be restored before, or at the time of, developement.

Thos. Markham — See replies to Wilhelm and T. B.

Medicus — 1. To make a bath of sel d'or, take eight grains of terchloride of gold, and dissolve in half an ounce of water; add to it solution of carbonate of soda, stirring well after each addition, until all effervescence ceases, and litmus paper is no longer reddened when immersed therein; make up with water the quantity wanting to measure *one fluid ounce* in all. You will now have a solution of the double salt, known as chloride of gold and sodium, containing one grain of the gold salt in each fluid drachm of liquid. (Should a precipitate be formed, it is in consequence of a slight excess of soda, and the defect may be rectified by the addition of a drop of hydrochloric acid). Next make a solution of hyposulphite of soda twenty-four grains, water one ounce. To prepare your bath proceed as follows:—Add one fluid drachm of the gold solution to two ounces of water, and one drachm of the hyposulphite solution in a *separate vessel* to another two ounces of water; pour the former (the gold), into the latter, stirring all the time; the sel d'or bath will then be ready for immediate use.

2. Quite possible to take stereoscopic pictures with a half-plate square camera, but it would require to have a front piece for the lens specially adapted to *shift its position*, and the dark slide would want a plate frame to take glasses, $6\frac{3}{4} \times 3\frac{1}{4}$.

3. Plenty of half-tone is easily obtained if the exposure be sufficient in the camera; if the collodion be too dense, add about half a grain of bromide of ammonium or cadmium to each ounce.

4. Glacial acetic acid is not *absolutely* necessary for a positive iron developer, but it is better to use that than any of a lower strength for this purpose, as it generally contains fewer impurities.

Stereoscope — You will find Burfield and Rouch's dark box for manipulating in the open air all you can desire. A bi-lens camera by all means; we are not so sure that it is really more expensive than the other arrangement named. You can give any amount of distance when you desire it with a bi-lens camera, as well as with a single lens one, by simply using one lens at a time. See pages 130 and 169 of our last volume.

A. K. Sparke — At page 206 of our last volume, you will find the process given by Sir William J. Newton, for transferring the collodion film to paper.

London — See our leader.

A Constant Reader — Your diaphragm is identical in principle with that of Mr. Sykes Ward, described in our last, but not so simple in construction.

R. B. R., Simon, Emma Knight, T. P., and Lux — You will find replies to your queries in our Leader.

T. C. D., and several other correspondents we are constrained to postpone until our next.

THE PHOTOGRAPHIC JOURNAL.

No. 90, Vol. VI.—MARCH 15, 1859.

During our recent visit to Edinburgh, we had, by the courtesy of Mr. Kinnear, the Secretary of the Photographic Society of Scotland, an opportunity of inspecting the silver medals recently awarded by that Society to the Rev. Mr. Raven and Mr. Lyndon Smith, as prizes for the best photographs exhibited by members and strangers respectively. If we were to state that the awards had given universal or even general satisfaction, we should be making an assertion that would tax rather severely the credulity at least of those who have had any, even the smallest experience in such matters; but in the instance before us, the mode of selection adopted (by general vote of the members) is peculiarly open to the liability of causing dissatisfaction.

We express no opinion upon the merits of the productions selected: the donors are of course the best judges of what they wish to encourage; but if they must give prizes, a proceeding which we by no means recommend, we strongly advise that for the future the votes of the general body of members be taken, for the purpose of determining, not the pictures entitled to obtain the reward, but the individual to whose judgment the selection shall be left; or, if preferred, three arbitrators might be chosen. At the first glance this arrangement may appear to amount nearly to the same thing, but it is not so in fact. It is easier far for the uninitiated in science or art to select a person in whose judgment they can place confidence, than it is for them to exercise discrimination upon points respecting which they themselves are only imperfectly informed. Moreover, competitors are more likely to be satisfied, as they have more certainty regarding the special points upon which they are called on to contest.

In a mixed assembly like any photographic society, many members will be found to give a vote upon the most extraordinary grounds; for instance, one gives it for what he considers the "sharpest" picture, without reference to subject, point of view, or in fact anything else; while another, having a great notion of size in a photograph, because he finds the manipulation of large plates troublesome, accords his vote to the picture covering the most extended surface. A third, having an eye *only* for artistic selection of subject, chooses one good in that respect, but perhaps having every fault possible in a photograph excepting that one avoided; whilst a fourth, having an antiquarian propensity, is so taken with the fidelity of representation as regards some coveted specimen, that he cannot conceive the possibility of anything of a higher character existing. Now, by the plan we propose, these dilemmas and absurdities are avoided, while by voting for the arbitrators each member has a voice in the matter.

An arbitrator or arbitrators being appointed, the selection of the pictures can be made, and at the same time the *reasons given* for the choice decided on. Successful candidates will then know the points in which their special excellence is supposed to consist, and unsuccessful ones will at least have the satisfaction of being made acquainted with the cause of their failure.

It appears to us that this method of proceeding would be far more likely to encourage that which is deemed desirable of attainment in our art, than the rather haphazard one adopted in the present instance.

We trust that these remarks will not be regarded in the light of fault-finding interference; they are addressed to our readers generally, to whom we feel bound to express an opinion upon all matters photographic that we have carefully considered; and as the giving of prizes for photographic skill appears to be a practice coming into vogue, we consider it is our duty to offer such suggestions as we think likely to further the progress of photographic science and art.

There is a matter of serious importance to the interests of photographers generally, but to professionals especially, that calls for speedy attention; we mean the daily increasing propensity amongst a certain class to impose restrictive limitations to the free use of various processes and materials in connection with photographic pursuits. This is an evil of much greater magnitude than appears at the first blush, and one likely to interfere materially with the progress of our art. The Council of the Photographic Society would do well to take into consideration whether any legitimate means might be adopted to obviate the continuance of a practice likely to prove seriously obstructive.

If any person, by patience, perseverance, and industry, succeeds in introducing an improvement, either in a process or piece of apparatus, although it may be brought about in consequence of suggestions unreservedly communicated to the public by others, he may, if he be so minded, secure to himself the exclusive privilege of its enjoyment by means of a patent; and although we may not in such a case approve of his illiberality, we cannot question his *right* to act as he may please with what is undoubtedly his own; but what we do complain of, and what photographers will do well strenuously to resist, is the now too frequent attempt to secure by patent that to which the pseudo-patentee *has no right whatever*. That this evil is a daily increasing one we have abundant evidence before us; and we will, by way of illustration, call attention to a few cases in point.

In our last impression we published a letter from a correspondent in the United States, desiring information relative to the period when bromides were first used in collodion in this country, as a patent had been obtained in America in July, 1854, to secure amongst other matters the exclusive use of this class of material, which supposed right has recently been enforced by legal proceedings. Now we cannot say exactly how long prior to the date mentioned, bromides had been used in collodion in this country; but the fact of their having been used both by Sir John Herschel and Mr. William Crookes, was made public not less than *thirteen months prior* to the date of the patent, and within a month or two of that announcement, bromized collodion was extensively employed in London, Liverpool, and elsewhere.

We have noticed that the same parties lately obtained a patent in this country for a photolithographic process, and this brings us to another observation: how is it possible, considering the number of patents granted in which the use of bichromate of potash with organic matter forms the essential principle of action, that more than one of them can be good; and if this be the case, why are applicants for letters patent involving the principle mentioned allowed to obtain them? Again, if the use of bichromate of potash with organic matter be not the exclusive

right of any one, then it follows that the most trifling variation in the *modus operandi* is sufficient to evade the infringement of a patent.

A third instance we may cite, in a patent recently obtained, viz., in June, 1857, by Messrs. Glover and Bold, of Liverpool, for what they please to term "the extended uses of photography as applied to dials, tablets, and pictures," these said "extended uses," consisting in the employment of *opal glass*, instead of the ordinary colourless kind, and the rendering the surface slightly dulled by the use of fluoric acid. Now if such obvious trivial variations can be the subject of a patent, it is by no means difficult to show how any infringement may be avoided while the same end is attained; but what renders the matter still more ridiculous is the fact that a patent was granted for *precisely the same thing* to Mr. John Ure, of Glasgow, in 1854.

It may be contended, that if a person obtain a patent improperly, he is liable to have it rendered void, and thus suffer damage; but granting this to be the case, what reparation is made to the public? If a photographer, knowing that the subject of a patent is and has been for some time public property, determines to act upon that knowledge and use the privilege, he renders himself liable to an action, to which he would not have been subject but for the improper concession of letters patent. It is not to the purpose whether he gains his cause or not eventually, he ought not to be placed in such a position by the wrong doing of another.

We cannot but entertain the opinion, that it would be well worth the while of photographers generally to attempt to devise some kind of supervision relative to the granting of patents upon all matters photographic.

We are rejoiced to find that our photographic friends in Glasgow have determined upon holding an exhibition in that city in April next, and we have much pleasure in affording space for the regulations adopted, which will be found in another column.

There are many earnest workers in Glasgow, and it is a thousand pities that the Photographic Society there should have been dormant for so long a time as has been the case. We trust that it will however now rouse itself like a giant refreshed. We recommend our professional brethren especially to respond to the invitation of the Glasgow Society, as we feel assured that their works will be duly appreciated.

We have been asked to give a description of the box recently brought out by M. Marion, of Regent Street, for the preservation of sensitised photographic paper without deterioration.

It will be as well to state all that we know of the subject. At one of the meetings of the French Photographic Society, a gentleman exhibited a box for which he claimed the quality of preserving, unaltered, the sensitised printing papers, but as he proposed to obtain a patent for the same, declined to give any information relative to its construction and mode of operation.

MM. Davanne and Girard, whose labours with regard to the investigation of the phenomena connected with photographic printing are so well known, in the course of their experiments, sought for a solution of the problem of the rapid deterioration of sensitised paper even when not exposed to the light, and found it due principally to the presence of moisture, favouring chemical action between the organic matter contained in the paper and the free nitrate of silver, with which it was impregnated. Under these circumstances, they very naturally concluded, that if the paper were properly protected from the access of moisture, it would keep good, if not for an indefinite, for a very long time at least.

In order to attain the end in view, these gentlemen recommended the use of tin boxes with closely fitting lids, and with the insertion of some substance greedy of moisture, in order to absorb even the small quantity enclosed with the air in the said box. The material selected in preference for this object is the *chloride of calcium*, one analagous in composition with the well known photographic chemical—the chloride of barium. For the purpose of dessicating the atmosphere contained in the box, the salt should be previously fused, which renders it more absorbent of moisture. It is easily prepared by the action of hydrochloric acid upon marble, and crystallising the compound formed, subsequently subjecting the crystals to a high temperature to drive out the contained water of crystallisation.

Acting upon the hints thrown out by the eminent French chemists above indicated, M. Marion has constructed a rectangular box of tinned iron, that shown to us being of sufficient capacity to contain many half sheets of Canson's or Marion's paper without being folded. Its dimensions were therefore about twenty inches long, twelve inches broad, and one-and-a-half inches thick. The lid is at *one end*, hinged to the box, and made to fit over tightly, and internally one of the large sides is seen to be covered with a kind of canvas, held in place by a fillet of tin soldered to the box itself—the purpose of the canvas is doubtless to confine the chloride of calcium, and yet allow it to exert an effect upon the air contained in the box.

We have heard that the form of box first adopted was cylindrical, having a loose smaller cylinder of perforated zinc, to contain the chloride of calcium, around which the excited papers were rolled.

We think that for amateurs a japanned cylindrical box would be most convenient, the length of which should be about an inch or so greater than the breadth of the papers desired to be preserved. The lid may be hinged or not, but must fit closely. *In the lid* a store of chloride of calcium may be readily confined, by a ring covered with some textile fabric, and the chemical can thus be easily renowed from time to time. Of course the papers must be loosely rolled up before insertion.

It is not improbable that with a little care the tin box without any chemical whatever, may be sufficient to preserve the sensitive papers sufficiently long for all practical purposes.

At the last meeting of the Photographic Society, we were shown by Mr. Rippingham an interesting specimen, produced by that gentleman, of a *transmitted positive* upon glass, taken direct in the camera from an engraving. It was of large dimensions, about twelve inches by ten inches, and seemed to possess due gradation of tone. The production of direct transparent positives of this kind was mentioned in our last number by our Australian correspondent, but whether the one shown by Mr. Rippingham was effected in a similar manner to that then described we are not aware, as the gentleman alluded to acted upon "strict conservative principles."

We believe, however, that he is of opinion that the process, whatever it is, may prove valuable as a means of glass ornamentation for windows, &c., and also for the production of stereoscopic transparencies without the necessity for printing of any kind.

We have little doubt, that if desirable, this feat may be accomplished without any more labour than necessary in taking negatives.

We learn from the *Shields Gazette* that, upon the occasion of the opening of the Jarrow Docks, Messrs. W. and D. Downey, of Market Place, South Shields, took a series of interesting photographs of the ceremonial, at the request of the contractors for the construction of the docks, by whom they had been employed previously in taking views of parts of the works from time to time during their progress. We are informed that these records of the opening ceremonial were taken by means of a *dry* collodion process, but for some of the plates with an exposure only of *three or four seconds of time*.

Our object in drawing attention to the facts above stated, is to show the steady advance which we appear to be making in bringing to perfection *dry* processes, a point of such importance to the art that it can hardly be overrated. It is but recently

we had to notice the feats of Mr. Kibble, of Glasgow, whom we regard as the apostle of instantaneous exposure with dry plates: his labours have evidently not been in vain; for though he has not yet communicated his ideas upon the subject, a simple display of what he has accomplished has been sufficient to set others at work in the same direction.

There are several obvious advantages in the use of dry plates for instantaneous pictures, namely,—1st, No necessity to expose them until the *exact* moment desired, as there is not any fear of their losing sensitiveness, as is the case with humid collodion. 2nd, No necessity for an assistant, as one person can do all that is required until convenient to develope. 3rd, Many more dry plates can be exposed in a given time than it would be possible to do with moist ones, and thus a larger number of records obtained of any interesting event of short duration.

We are most heartily sick of personal matters, and so far as concerns ourself individually, intend entirely to ignore such as may be directed against us for the future. We have, however, received from the Birmingham Photographic Society, a copy of a "resolution" for insertion that demands some notice at our hands. In the "resolution" alluded to we are accused of having made "an attack" upon the editor of the official organ of that Society, and then proceeds as follows, viz.:—

"This Society having always entertained the most friendly feeling towards Mr. Sutton, indignantly denies the imputation contained in the said attack (!), viz., that the Council had any intention of transferring the reports of the meetings from the 'Notes' to the 'Liverpool Journal.'"

Truly some people have a singular notion of what constitutes an "attack"— we were under the impression that our remarks were but a mild protest against "an attack" made upon *us* by the individual named by the Council. We made no such statement as is attributed to us, nor intended any such insinuation. We simply asserted, in terms somewhat vague it may be, that the "withdrawal of his objections" was a *wise proceeding*, seeing that, as he could not help himself, it was scarcely worth while his retaining them.

There are several other inaccuracies embodied in the "resolution" with which our readers will not care to be troubled, any more than they do about that noticed, but as the object of the Birmingham Photographic Society appears to be to exhibit cordiality of feeling on the part of its members towards the gentleman named, and their "antagonism" to ourself personally, much as we regret the existence of the latter circumstance, we do our best to carry out the views of the Birmingham gentlemen by publishing their remarks.

POSITIVE PRINTING.

Mr. Maxwell Lyte's Gold Toning Formula.

This formula answers equally well for plain or for albumenised paper; but it is more especially suited for the latter, which is sometimes difficult to tone by ordinary methods. The proofs, printed darker than they are required to appear when finished, are first laid to soak in a dish of clean water, then removed to a dish of salt and water, in which they must lie at least five minutes, with the view of converting any free nitrate remaining in them into chloride. The degree of strength and time of immersion in this bath are unimportant. An ounce or two of common salt to a pint of water will answer. This bath is essential to preserving the gold bath from decomposition. The latter is prepared as follows:—

Chloride of gold	10 grains.
Phosphate of soda	3 drachms.
Distilled water	1 pint.

This mixture should be neutral to blue litmus paper. The proof, so soon as it is placed in this bath, changes colour, and passes rapidly from red, through various hues of purple, to a rich black or rather grey; while the green solarised parts darken and develope their half tones in a surprising manner. The toning may be stopped at any particular point: if at the purple hue, the picture, when dry and finished, will be of a rich deep sepia; if at the black, the picture will be more inclining to black and grey. Upon removal from this bath, the proof is placed in pure water, and afterwards in a fresh solution of hyposulphite of soda, twenty per cent., where it should be allowed to remain an hour at least, then washed as usual. It loses but little of its strength in the hypo, but becomes clearer and better defined.

The principal advantages of this method appear to consist in the colouring bath being perfectly neutral, and consequently it produces no decomposing effect upon the hyposulphite, thereby ensuring greater stability for the proofs. The colour is produced solely by the gold without the aid of sulphur or other deleterious agents; and moreover, no organic matter being present in the bath, spontaneous decomposition, causing the gold to become precipitated, is avoided. The gold bath may be prepared in any quantity; the portion used must not be returned to the stock-bottle.

For proofs which require to be over-printed, a few drops of syrupy phosphoric acid, if added to the above bath, will bring out the details of the deeply solarised parts: but then more than ordinary care is required in washing the proof before it is put into the hypo, to which a little carbonate of soda or chalk is a useful addition. The phosphate of soda in the above formula may be replaced by one drachm of bi-borate of soda—common borax.

DARK SLIDES *versus* LATENT LIGHT.

By John Glover.

There are, without doubt, greater enemies to the photographer than are ever dreamt of in his philosophy, but I dare venture to assert that the subtle agent by which all his results are obtained is one that presents the greatest variety of phases, and is the most dangerous because least understood. It therefore behoves us, who wish to advance the interests of our art, to take up this most difficult and delicate subject, to investigate the facts in all their bearings.

A few months ago, the startling theories of M. Nièpce de St. Victor, and still more wondrous results, took the world by surprise, but we now hear whispers of failures in other hands but his, and by some, experiments in "bottled up light" have been placed in the category with the bottle tricks of other conjurors. Probably, if it had not been for an accidental stumble which precipitated the writer into the well, at the bottom of which truth is said to be concealed, the reader would not have had his patience tested by scanning over the attempt to embody these ideas.

The directions given by the fathers of photography, were, "take every precaution to shut out every ray of white light from your operating rooms, cameras, dark boxes, &c., and in manipulating use very little of the yellow," but since the astounding discoveries previously alluded to, our caution should extend still further than that of our predecessors when light is in question. Take care that in an unguarded moment he does not enter your apparatus, and lurk in a dark corner, to play fairy-like pranks, dashing out with his invisible brush the pencillings of his visible brother on the outside. Perhaps our scientific friends may think that the writer is *drawing* on their imaginations, but to speak in language very commercial, but very unphotographic, to make the draft *valid* I will at once *endorse* it with something practical.

My experience during the past season was principally in dry collodion, which in my humble opinion is *the* process for the professional tourist or persevering amateur. In working with dry plates, it was my custom to prepare them in the evening, and when dry to place them in separate dark slides, expose them during my rambles on the following morning, the plates remaining in the slides till the evening, when I developed them; and now I come to the remarkable phenomenon which it is my present object to describe.

On most of my negatives, a dark but regular line could be observed, running from end to end, not far from the upper edge of the plate; this was most distinguishable when foliage or other shadowy substance came within its range. For a long time I was unable to trace this to its source, looking in vain for some minute crevice in my slides or camera, till at last it struck me that the appearance was due to *latent light*, and my suspicions, as I shall presently prove, were not groundless. The dark slides were new and the same as are commonly used, having a lifting shutter with a hinge to fall flat on the top of the camera during exposure. The hinge in this instance was constructed of light-coloured leather, and being lifted entirely out of the slide, would be exposed to the full glare of the sunlight, and again drop unto its former position close to the sensitive surface, though of course not in contact, giving off the latent light which it had just absorbed. On

developing some hours afterwards, the first deposit of reduced silver was along that portion of the plate that had been in a line with the light-charged hinge, showing that of the two influences the action of the latent light had been the more energetic.

Let me ask, how many dry plates have been ruined, and perhaps processes discarded, from want of proper precautions being taken in keeping out or carelessness in admitting this invader? Perhaps we have drained our plates against a whitewashed wall, or other light-absorbing substance, or rested them on white blotting paper, which before the intervention of our yellow medium had been subjected to the continued influence of actinic light. May we not legitimately look in a new direction for many of those additions, not improvements, to our pictures, to which the most skilful manipulator is liable and for which he has never been able to account?

I would urge in conclusion, that every one who has time and talent at his disposal, should continue the research that M. Nièpce has opened up, and with such an instance as that I have described before us, let us not form hasty conclusions and discard theories, which have been the result of well directed experiment, because they do not at once prove successful in our hands. I had nearly omitted to state, that some of my negatives have a peculiar circular transparent mark, which could always be traced to one particular slide, and corresponded with the head of an iron screw in the shutter. I satisfied myself there was no contact, and, strange to say, the screw head is in such a position as never to be exposed to the light. I am at present at a loss for a solution of this phenomenon.

PHOTOGRAPHY ON PAPER.—QUICK PROCESS.

By M. Vernier, Jun.

Photography on paper has gone somewhat out of fashion since the introduction of collodion, and for very good reasons. Collodion is quicker and yields sharper pictures. Still, if we compare two positive proofs of the same landscape, of large dimensions, the one taken on collodion, the other on negative paper, we shall perceive that the latter is richer, softer, more aerial, and with more depth; in fact, more artistic than the first. This difference in results has induced me to make new experiments with paper, with the view of obtaining the sharpness and rapidity of collodion.

The method which I now submit to the attention of your readers will, I hope, fill up that gap, and restore negative paper to the high place it once occupied in photographic processes.

As a basis for my new experiments, I have selected the gelatine employed by M. Baldus, one of our most accomplished artists. This substance does not produce any change in the nitrate of silver bath, nor impair its limpidity. In following his method I obtain greater finish by sizing the paper before iodising it, and greater rapidity by immersing it in an ethero-alcoholic iodide bath before sensitising; besides these two operations, which are not in M. Baldus's process, I develope the image with sulphate of iron, which, as is well-known, is the most energetic developing agent.

I select a paper of very equal texture, marking one side with a pencil, then float it on the following for about two minutes:—

Rain water	12 ounces.
Gelatine	80 grains.

When removed from this bath, the sheets of paper are suspended by an angle and allowed to drain and dry; then placed in a portfolio and pressed flat.

Iodising — Take of the above gelatine solution 12 ounces.

Iodide of potassium	3 drachms.
Bromide of potassium	36 grains.

Warm the mixture, and when the ingredients are dissolved, filter through muslin into a dish kept warm on a water bath. In floating the paper on this solution, the usual care must be taken to avoid bubbles, and the placing the gelatined surfaces in contact. When dry, they must be kept in a box in a dry place.

This double preparation gives a greater fineness to the proofs, renders the paper unchangeable, preserves its whiteness, and keeps it free from spots, because the iodine is not in contact with the paper, which often contains substances that neutralise its action, and produce spots upon developing, which injure the proof irreparably. The preliminary sizing is then of undoubted utility.

Sensitising — To sensitise this paper I take it by a corner with a pair of horn forceps, and immerse it in the following solution:—

Ether	1 ounce.
Alcohol	3 ounces.
Iodide of potassium	130 grains.

The paper imbibes this solution. If I intend to use it *wet*, I float it immediately on a collodion negative bath; after a contact of two or three minutes I remove the paper at once to the camera slide. If I use the paper when dry, it is only necessary to suspend it in the dark, and preserve it out of contact of the atmosphere.

Exposure — The time of exposure in the camera is nearly the same as with collodion. I have observed that when the sensitising bath is acidulated with acetic acid, the paper becomes more sensitive. In every other process the presence of acid retards the luminous action, while in this it has a contrary effect. The acid opens the pores of the gelatine, causes it to swell, and consequently renders it more permeable to the chemical action of light.

Developing — Upon removing the paper from the camera I immerse it in a mixture of alcohol and water; then pour over it a filtered solution of sulphate of iron, which has already been used with collodion. The image appears immediately in all its details. If from too little exposure it is deficient in vigour, I let the paper drain, then lay it upon a glass plate, and pour over it, from an upper corner, a weak solution of nitrate of silver, and then apply, for the second time, sulphate of iron. This simple method of strengthening an image will give all the intensity desired.

With a good stock of iodised papers the manipulation of this process is very simple, requiring but little time, and no new complication of baths; but its chief recommendation consists in the facility it offers for obtaining very good proofs by the dry method. With reference to what I have said above, relating to drying the iodised papers by suspending them in the air upon removal from the iodising solution, I may remark that it is not absolutely necessary for the dry process. I prescribed it because I found it convenient to operate in that manner. Usually, I prepare eight to ten sheets at once, and by the time I have floated the last, the first is sufficiently drained to admit of its being placed on the nitrate of silver bath. After the two washings that must follow the sensitising of the papers, the other operations are the same as with the wet method.

One day I took two pictures of the same object, and treated one with sulphate of iron and the other with gallic acid. The proof treated with sulphate of iron developed rapidly, and yielded a very good picture, as usual; that put into the reducing bath of gallic acid gave, after the lapse of half an hour, no signs of a picture; yet I was sure the paper was properly exposed in the camera, and with exactly the same time as with the other proof developed with sulphate of iron. To accelerate the development of the image I added some drops of nitrate of silver to the gallic acid, and waited another hour without obtaining any results. At length, impatient with waiting so long for a picture, I took a bottle containing an old bath of nitrate of silver, which had served for many experiments, and contained ether, alcohol, iodides, acids, and a little sulphate of iron. I decanted the clear portion of the liquid, and then poured a quantity of it into the gallic acid solution. My attention being engaged, I left the proof to itself, as an experiment from which I did not expect much. Upon looking at it an hour afterwards, I was surprised to see the picture completely developed; but what surprised me still more was, that the developing bath had undergone no change.

I ask my fellow photographers and chemists, what substance in the old bath was it that kept the gallic acid in good condition? and I beg also to submit other questions.

Why is collodion the most rapid of all photographic agents?

Is this rapidity due to the pyroxyline which enters into the composition of collodion, or is it due merely to the two substances dissolved in it?

Without presuming to decide upon these questions, I venture to atttribute to the ether and alcohol combined this accelerating property. In the method described above it is shown that the ether and alcohol, being imbibed by the paper instantaneously, facilitate the combination of the photogenic products, and consequently opens a freer access to the chemical action of light. These substances are, therefore, two powerful agents in photography.—*La Lumière.*

GLASGOW PHOTOGRAPHIC SOCIETY.

Exhibition Regulations.

The following Regulations have been laid down for intending Exhibitors at the forthcoming Photographic Exhibition, to be held in the Gallery, No. 67, Buchanan Street, Glasgow, during the month of April, 1859.

1. Every description of Photographic Pictures will be admissible, but not more than twenty portrait specimens to be admitted from any one exhibitor. It is recommended that all pictures be framed and glazed. The name of the subject, the process, the artist, the owner, and if for sale, the price, to be marked upon the back of each picture.

2. A list of the photographs sent must be enclosed in the case, and a duplicate list forwarded by post to Mr. Barr, the Acting Secretary, No. 1, Renfield Street, Glasgow.

3. Pictures touched by the brush to be so described.

4. A commission of ten per cent. will be charged upon all sales of pictures.

5. It is requested that all works intended for Exhibition, be sent carriage paid, to the Rooms, No. 67, Buchanan Street, on FRIDAY the 25th, or SATURDAY the 26th March; and, at the close of the Exhibition, they will be carefully repacked and returned carriage free.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of the above Society was held at the Literary and Philosophical Society's Rooms, on Wednesday, the 2nd instant, Mr. NIELD in the chair.

A large collection of photogalvanic engravings, by Mr. Paul Pretsch, were exhibited to the meeting by the SECRETARY.

Mr. SIDEBOTHAM exhibited one of Captain Foulkes's compact cameras for taking pictures 9 × 7.

Mr. PARRY exhibited a very compact and simply constructed camera, designed by himself.

Mr. KERSHAW exibited a stereoscopic camera, and dark box for plates, containing a yellow glass window, so that the plates might be seen without injury from light.

Mr. SIDEBOTHAM called the attention of the meeting to this arrangement, as he thought it would be of great importance when passing the custom-houses, and said he should adopt the idea, having previously thought of the subject. He said he had been several times annoyed by the custom-house authorities wishing to open his dark box.

The CHAIRMAN called the attention of the meeting to a very satisfactory negative, taken by Mr. Patterson, simply with dry collodion on the coating of gelatine, as recommended by Mr. Dorrington.

Mr. SIDEBOTHAM read a letter he had received from Mr. Hardwich, who stated that he had succeeded in making a very suitable collodion for the dry process. Mr. Sidebotham also remarked that he had lately been through the London Exhibition, and was much disappointed to find a great scarcity of collodio-albumen pictures, and few of those exhibited being good ones.

Mr. WARDLEY, however, stated that he had seen the Exhibition, and had observed some very good collodio-albumen pictures.

Mr. SIDEBOTHAM made a suggestion to the meeting that an album should be procured, and that each of the members of the Society should send his portrait for insertion, as he thought it would form a very interesting record. The suggestion was approved of by the meeting, and a resolution passed that the Honorary Secretary be authorised to obtain a suitable book for the purpose.

Mr. BROTHERS promised to send a copy of the portrait of the Lord Bishop, the President of the Society, and volunteered to take the portraits of any members gratuitously who would call upon him at his rooms, and it was proposed that a portrait be obtained of the late Mr. Archer and other eminent photographers.

Mr. SIDEBOTHAM exhibited a large lens, by De Rogni, which possessed several advantages: it was possible, by changing some of the glasses, to arrange the foci to various lengths, and instead of the troublesome screws, bayonet joints were supplied, which were highly approved of by the members.

After a vote of thanks to the Chairman, the proceedings closed.

LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary general meeting of the above Society was held on Tuesday, the 1st inst., P. LE NEVE FORSTER, Esq., V.P., in the chair.

The minutes of the last meeting were read and confirmed.

Mr. BISHOP tendered a notice of motion, that the Council should be required to send to every member a printed copy of the accounts of the Society, and a statement of the names in which the funds of the Society are invested.

The CHAIRMAN decided that Mr. Bishop's motion could only be made at an annual general meeting of the Society, or at a special general meeting, convened in pursuance of a requisition signed by twenty members; the only business of the ordinary meetings being simply the discussion of matters connected with the art and practice of photography.

Mr. RIPPINGHAM, on the part of the Council, denied any desire to conceal the accounts; they were laid before the members present at an annual general meeting, and an extract printed in the Journal of so much as is generally considered sufficient. An application by any member to the Council for permission to inspect the books had never been, or ever would be, refused.

Major COOPER, after a few prefatory observations, read a paper on *The use of Malate of Silver in Photographic Printing*, illustrating the same with specimens.

Mr. HARDWICH was exceedingly glad of opportunities for the discussion of new printing processes. It struck him, however, that there would be a difficulty in Major Cooper's; because, even if one employed *pure* bicarbonate of potash or soda, he would not secure the absence of chloride of silver, owing to the presence of chlorides in the fabric of the paper; and in attempting to get out the malate of silver, by simple malic acid, the chloride of silver would be left behind. He thought all processes for fixing albumenised proofs without the use of hyposulphite of soda radically defective. He had tried ammonia, and did not succeed in perfectly fixing a picture upon albumenised paper, although he had accomplished it upon plain paper.

Sometime since, he had spent a great deal of time, and took great trouble, with malic acid, and found it liable to be contaminated with other substances—there was a difficulty in obtaining it free from oxalic acid, and acids of a similar kind, which pervade vegetable substances.

He (Mr. H.) was not prepared to understand, that the reduction by light by the Major's process would be sufficiently rapid; for although there is a certain amount of sensibility in his compounds, especially when the amount of free nitrate of silver is large, still the process must be slow and the prints rather faulty. He (Mr. H.) usually found that without the aid of chloride of silver he could not obtain a rapid and intense reduction on the parts exposed to the sun's rays; and, therefore, did not at present imagine that Major Cooper's process could be successfully carried out as described.

Major COOPER called attention to the first part of the process—viz., the floating in *distilled* water, to prevent the formation of any chlorides in the paper. He admitted his printing was rather slower than the usual processes, although no one of the prints upon the Society's table had been exposed more than an hour or an hour and a-half.

Mr. HANNAFORD handed to the Chairman some slips of paper as bearing upon some of the remarks made by Mr. Hardwich, and stated that they were printed by the ordinary process upon albumenised paper, with the exception of the omission of the salt, and consequently the absence of chloride.

Mr. SHADBOLT stated that Mr. Hannaford had overlooked the simple fact, that no paper could be obtained which was perfectly free from chloride, and that, consequently, some portion of chloride of silver must be formed. He thought that Mr. Hardwich was a little too fearful that ammonia would not dissolve out all the chloride of silver. He (Mr. Shadbolt), as a member of the printing committee, made many experiments in that direction, and went to the extent of subsequently soaking a print so fixed in a weak solution of hydrosulphate of ammonia, which did not blacken in the lights, proving unquestionably that all the chloride of silver had been removed. The only real objection to the use of ammonia, was its suffocating effluvium; but if it be a *sine qua non* to get rid of hyposulphite of soda, the means of so doing are in our power. It struck Mr. Shadbolt, that by using bicarbonate of ammonia, the ammoniacal fumes would be avoided. By bicarbonate of ammonia he meant the sesqui-carbonate after exposure to the air, which thus lost its pungent quality. He should like to know whether chloride of silver is soluble in a solution of this salt.

Mr. HARDWICH stated that it was not the chloride of silver but the oxide of silver which he feared. The oxide of silver associated with the albumen, or with the animal matters in the paper.

Mr. SHADBOLT begged to be allowed to make the further remark, that Major Cooper was a little out in his chemistry, when he stated that carbonate of silver is soluble in malic acid. It was not that the carbonate of silver is soluble, but simply that the malic acid displaces the carbonic acid; and hence malate of silver is formed.

Major COOPER stated that the carbonate of silver remained in suspension a considerable time, and that the whole was eventually perfectly dissolved, and that what remained in the paper was perfectly soluble in boiling water. The Major then read a memorandum which he had made, to the effect that malic acid must not contain tartaric acid, lead, nor colouring matter; that malic acid does not precipitate bright metallic silver from the nitrate, as had been stated, but bright, highly refractive crystals, so brilliant that they might easily be mistaken for metallic silver spangles; but

they could easily be dissolved in boiling water. The Major stated, that he had precipitated some nitrate of silver by malic acid, and observed that which at first sight he considered metallic silver falling; but upon close inspection, he found it to be a precipitation of crystals, which he afterwards boiled, in a Florence flask, with some water, and the solution was perfect. He thought when the carbonate of silver was dissolved, though a malate of silver remained in the paper, it was removed by boiling.

Mr. SHADBOLT thought that Major COOPER had mistaken the point which he (Mr. Shadbolt) had alluded to. The Major had stated that *carbonate of silver* was soluble in malic acid; but he must have meant, not that carbonate of silver, as a carbonate was soluble in malic acid, but that the malic acid displaced the carbonic acid, forming a malate of silver, which is soluble in water.

Major COOPER: "Just so."

The thanks of the meeting were then accorded to Major Cooper.

The SECRETARY then read a letter from Mr. Hardwich, asking for a committee of examination to inquire into the doubtful points in connection with the manufacture of collodion, and offering, if it were accorded, to lay before it, unreservedly, all the minute details of his experience in its preparation.

The SECRETARY stated that the council had considered Mr. Hardwich's proposition, and resolved that a committe of the Society should be appointed to examine and report on the various formulæ for making collodion, and that members of the Society and makers of collodion be invited to send samples of collodion, such samples to be accompanied, unconditionally, by a full statement of the manner of its manufacture.

The SECRETARY then read a letter from Mr. Penney, of Cheltenham, accompanying some specimens of carbon printing by Mr. Pouncy's process, in which sepia, indigo, and other pigments were substituted for carbon in a state of mechanical division.

Mr. FRITH stated that he had tried the carbon printing, as had also several of his friends, without any success, and they had all given it up as comparatively hopeless for general purposes.

Mr. SHADBOLT had not before heard of Mr. Hardwich's suggestion, and did not quite understand exactly what had been decided upon. The French Photographic Society had long been in the habit of referring to a sub-committee, certain questions upon which it was thought advisable to pronounce an opinion, the names of the members of the sub-committee being published, and that system had worked well. If he did not misunderstand Mr. Hardwich's suggestion, it was, that a committee should be formed for the purpose of testing collodion by different manufacturers, who might be willing to subject their collodion to the test, and give unreservedly their formulæ for its production to the committee. The proposition appeared likely to be beneficial to the photographic art, as it would probably clear up several obscure points connected with collodion; for instance, he might mention, that some persons entertained the opinion, that collodion, containing a great mass of pyroxyline, is most sensitive, while others consider, that in order to be extremely sensitive, it must be exceedingly thin; and it may turn out that both parties are right under certain circumstances.

There was another very great difference of opinion existing of very considerable importance, now that the dry processes were, as it were, upon their trial; and the difference arose upon the question, whether the collodion made with acids at a high or a low temperature is the best. Mr. Shadbolt's object in alluding to this matter was because it very frequently went abroad, that if a committee were formed to investigate any particular point, it was apt to be thought that everything connected therewith, submitted to the Society, must of necessity be tested by the sub-committee. The committee should confine itself to testing those samples which the makers requested to be tested.

Mr. HARDWICH confessed he did not precisely understand Mr. Shadbolt's observations; but if he had intended to have said that the committee should examine the great number of specimens of collodion that may be sent to them, he (Mr. Hardwich) thought that it would be utterly impossible for the committee to do the work; but he, having experimented upon collodion for two years, and collected a mass of information which had never been published, had by degrees, and by the assistance of many friends, arrived at one formula, which was on the whole a sound working formula. He did not think it an unfair proceeding to ask the Society to appoint a committee of practical men to examine it, and to say whether it will do what it is professed to do. He would withhold nothing, and would describe exactly how his collodion is to be made, and what precautions are to be used to secure the result. He said, as he had offered this to the Society, he thought that he was entitled to the commission to examine this collodion alone. By the collodion he meant the pyroxyline, and did not refer to the iodide or bromides of cadmium, &c., but simply to the pyroxyline, and considered the production of that substance to be one of the most complex chemical problems, as there were so many peculiar changes which take place in its manufacture. It is a problem which no single person can solve, and can only be accomplished by a combination of persons. He had letters from India, and from almost every part of the world, telling him in what condition his pyroxyline had arrived, and how it had done its work. He thought he was entitled to a committee upon this single point.

The CHAIRMAN stated that the form of the resolution of the council for the appointment of a committee did not quite agree with Mr. Hardwich's views. The committee would be formed for the purpose of considering those collodions, and those formulæ for making them, which individuals and manufacturers and others may desire to lay before it, not confining themselves to the one collodion of Mr. Hardwich, but taking a broader basis of operations.

Mr. SHADBOLT stated that it was in consequence of the resolution of the Council, and the suggestions of Mr. Hardwich not quite tallying, that he had spoken upon the subject.

Mr. SEBASTIAN DAVIS stated, that he had, within the last week, carefully examined the formulæ laid before the public for the manufacture of pyroxyline, and followed precisely the formula which Mr. Hardwich had mentioned in his work; and found, that by following that exactly, with the materials he had used, instead of obtaining a satisfactory pyroxyline at the temperature there stated, the cotton dissolved more like lump sugar than cotton; and it appeared that the recommended quantity of water was decidedly in excess. He merely stated this, to show why it was desirable, that when gentlemen communicate details, they should have an opportunity of defending their assertions. He knew full well that many communications had been made to the Society, and yet gentlemen with a considerable amount of photographic knowledge have not succeeded in following out the views held out, although they appeared to be exceedingly explicit and clear; therefore, he, for one, would advocate the appointment of a working committee, to test the particular formula laid before the meeting. Under these circumstances, there must be a full, clear, and precise description of the whole process, from the commencement to the end, so that any operator shall be able to succeed in the same manner; because it is known, that science is based upon exact principles, and all must arrive at the same result by following the same course.

Mr. HUGHES rose to call attention to the important question involved. Over and over again complaints had been made as to the inutility of societies like this, because they have not undertaken such duties as that now proposed; but the question was, whether the time had arrived when it had become desirable for this Society to pronounce an opinion upon a certain subject? Was it desirable, from time to time, when any particular novelty was presented, to investigate the merits of that novelty, and express an opinion upon it? Mr. Hardwich thought he had a collodion which would settle the much-vexed question as to a definite formula for this usually unstable substance, and was willing to communicate it to the world, with all his experience, upon the condition that the Society shall pronounce an opinion. If he (Mr. Hughes) understood Mr. Hardwich rightly, he would like this committee to test the collodion for all the various contingencies for which collodion is used—for interiors, for exteriors, for still life, and for portraits — while the resolution of the council is, that a committee be appointed to investigate the merits of collodion generally made by any one, upon the condition that their formulæ be published. If Mr. Hardwich's proposition did not go to that extent, it fell to the ground, and a new one is taken up, which it appeared the council were not invited to entertain.

Mr. RIPPINGHAM stated that Mr. Hardwich, himself one of the Council, was present, and did not dissent from the extended resolution.

Mr. HARDWICH said he had no possible objection to the alteration, as proposed, and should be most happy to modify the original proposition, to bring it in accord with the resolution. With reference to the remarks of Mr. Davis, he should be happy to reply, but the question was, whether it would be desirable now to discuss chemical formulæ, which is a difficult thing to do. With reference to the cotton simply, it was known that there were twenty-six different kinds of cotton; he used the best and finest he could get, and he could say, that flax might dissolve in an acid mixture which did not dissolve cotton, and white China grass would dissolve in an acid that would not dissolve cotton. It might be found eventually, that he had not satisfactorily answered every question with reference to collodion, but he believed that he was prepared to publish more than had ever been published up to the present time, and that it would not be doing justice to himself to refrain from bringing his results forward.

Mr. HUGHES rose in explanation. He had thought that there was an antagonism between the resolution of the Council and the proposal of Mr. Hardwich, and concluded by asking the Council to name the committee.

The CHAIRMAN stated that there had not been time at the last meeting of the Council, but that would be done at their next meeting.

Mr. SEBASTIAN DAVIS thought he should be scarcely in order in going into the chemical composition of pyroxyline, but might do Mr. Hardwich the justice to say, that in the following page of his book, he distinctly asserts, that he cannot always be depended upon in minute particulars; because he there asserts, that he lays in a very large stock of sulphuric acid, ascertains by direct experiment the correct quantity to be used, and follows out the result with the remainder.

The CHAIRMAN stated that Lord Lyndhurst had procured the appointment of a committe in the House of Lords upon the subject of artistic copyright, and the Council of the Society had appointed a committee to attend and lay evidence before the House of Lords, with reference to its bearing upon the interest of photographers.

Her Majesty, the Prince Consort, and two of the Princesses visited the Exhibition a few days ago. Her Majesty expressed great gratification at the success attained, and his Royal Highness, the Prince, made a suggestion to the Society, which the Chairman thought a valuable one, and the duty of the Society to undertake, namely, to get together a complete and satisfactory record of what has hitherto been done in photography, and make a collection of early photographs, to show the progress which has been made from the earliest to the present time — for the future there could be no difficulty; but with regard to the past, the Society must rely upon its members to send in such specimens as will illustrate the point desired, and the Society will place them in proper custody.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on Monday, the 21st ultimo, at the Golf Club House, Blackheath, the President, J. GLAISHER, Esq., in the Chair.

The PRESIDENT commenced the business of the evening by calling the attention of members of the Society to the Photographic Soirée which it was in contemplation to hold.

It was moved by Mr. HARDING, seconded by Mr. KNILL, "That such soirée be held."

A Committee was proposed by Mr. WOOD, seconded by Mr. LEDGER, for the furtherance of this object, composed of the President, Vice-President, Treasurer, and Secretaries, *ex officio*, Mr. Bennock and Mr. Wood.

A letter was read by the PRESIDENT from F. Haes, Esq., dated Sydney, relative to the deterioration of dry collodion plates, which he wished communicated to the Societies at home.

The PRESIDENT exhibited some photographs taken in the neighbourhood of Linton, North Devon; Mr. WOOD some views in the South of France; Mr. KNILL some fac-similes of frescoes, from the Campo Santo, Pisa.

William Porter Knightley, Esq., was duly elected a member of the Society. The meeting then adjourned.

LIVERPOOL PHOTOGRAPHIC CLUB.

ON Tuesday evening, the 1st instant, the third evening meeting of the above newly-formed Club was held at Mr. Keith's Rooms, Lord Street Chambers: there was a full attendance of members, and several novelties were exhibited.

Mr. SCOTT, of Birkenhead, explained the contrivance of a very excellent photographic pack, combining the convenience of both tent and barrow. A large box, when opened, presented table, front, and roof; four legs were speedily screwed into this, and a drapery attached soon enveloped the whole of the sitting figure of the operator, who worked with great facility upon plates of large size. When it was to be removed, the box, repacked, was placed on a small carriage with two wheels and an iron handle, altogether about as large as a child's perambulator, minus the third wheel.

What was especially commended was a water bottle of gutta-percha. Being flat, it was slung round the shoulder, and having a wide mouth to it, a large cork, pierced with two holes, was inserted; in one a bent tube was placed, in the other a long slender brass one; on inclining the bottle, the air entered the brass tube, and being smaller than the exit through the bent tube, the flow was even, soft, and continuous, like a stream of oil, and could be stopped with all the facility of a tap, by simply pressing the thumb on the top of the air tube.

This gentleman's negatives were remarkable for their depth of shadow, minute richness of detail, and excessive cleanness of their whole surface.

Mr. COREY exhibited his first specimen of toning by Mr. Hardwich's new formula for a gold bath with citric acid, and used warm. He reminded those present that the highly albuminized paper is very desirable on account of the brilliancy of its general effect, at the same time it is remarkable for the fidelity with which it brings out all the charms of the intermediate portions of half tone and lighter shadows, though objectionable from the fiery red, or to at best, brown brick-dust hue when finished. This is entirely obviated by the use of the bath in question; for any amount of inky blackness can be thus obtained. The specimens were highly commended for the extreme whiteness of the unprinted paper, and the rich purple blacks of the deep shadows, while the minuter portions were so well preserved.

Mr. COREY mentioned that Mr. Forrest, who was unavoidably absent, had been operating most successfully on a favourite project, in which he had displayed a considerable amount of enterprise, viz., the permanently burning photographs into the surface of glass. That nothing daunted, but rather stimulated, by his former unsuccessful efforts, he had determined to take advantage of the known changeable qualities of certain minerals when under fire, and expected to produce great novelties from his present experiments. Mr. Corey called upon those well versed in chemistry, and changes of metallic oxides in the furnace, to aid Mr. Forrest in his labours, when Mr. J. Glover and Mr. Keith were appointed for that purpose.

Mr. CAUTY exhibited some new specimens of Ross's lenses of the orthoscopic character, with the shifting diaphragm; and after a very animated and social evening, the meeting separated at a late hour.

Letters to a Young Photographer.

No. VI.

MY DEAR EUSEBIUS,

By this time you doubtless have obtained a lot of pretty good specimens of positive printing. Your proofs should be quite free from a sulphur-yellow in the light, while the tones of the picture may range through all the hues of bistre, umber, sepia, or Indian ink. What are termed the violet and purple hues are the most admired; but, as artist, you will not forget to tone your proof with such a colour as best harmonises with the subject of the picture, and for this object I will just give you a few hints. The richness of colour may, in landscapes, &c., be in the inverse ratio to their interest. For instance, suppose your picture represents a rough, rocky region, bold in feature, and not very picturesque for want of the poetic element, such a picture will look best if toned of a warm umber hue. For diversified landscape scenery, I prefer a red violet hue, or something of the mulberry, which may range to the different tones of sepia and bistre. For sky and water pieces, I prefer the deep purple hue; while for portraits there is a peculiar neutral brown, difficult to describe, which yields a very fine harmonious effect. You will doubtless encounter a difficulty that has perplexed me very much, which is, that certain negatives obstinately refuse to yield the hues you desire, no matter how you print them. I have some negatives which, when examined carefully, cannot be distinguished from others, but from which it is impossible, in the usual way of printing, to obtain any but reddish-brown pictures. This is an anomaly which at present I cannot fully account for. If I work half a dozen negatives of the same object, looking in every respect alike, expose them all at the same moment, with paper prepared under exactly similar circumstances, so that you would expect the positive proofs to be identically the same—yet I can point out, at first sight, the individual negatives from which they are printed, by the variations in colour. And this is not the accident of the day or of the hour, but occurs with unvarying regularity. Thinking that some of these negatives required longer exposure to produce the violet and purple hues, I tried what that would do; still they did not yield the same tones as the others.

Now this result need not trouble you much. I mention it but to guard you against perplexity and disappointment, in striving to attain the unattainable. There may be something in the quality of the negative that gives such baffling results, which interferes with the chemical action of the light in passing through it; and you know that negatives themselves differ much in colour. I have negatives that are of a pale green colour, others are steel blue, while some partake of the colour of mud, and one sort is about as good as another.

I suppose you will prefer to mount your pictures yourself; at least, you ought to do so, else you will not become a complete photographer. Such a one is armed at all points, and can turn his hand to every thing. In mounting, your first care will be to trim your proofs square. For this operation you will require a very sharp penknife, a steel square, such as is used by bookbinders, and a piece of roughened thick plate glass; the size of the two latter implements will, of course, depend upon the size of your proofs. In trimming off the margins of the pictures, take the vertical lines first, and square the sides parallel with them, and then square the horizontal lines in conformity.

You can mount your pictures upon Bristol board, or upon drawing paper. I generally use a drawing cartridge paper, which answers the purpose as well as a more expensive kind. Have ready some starch-paste, made with *white* starch in preference to the blue. Mix a teaspoonful of the starch with a little cold water, adding a few grains of carbonate of soda; then pour on it half a pint of boiling water, stirring it briskly meanwhile. It should be of the consistence of cream; if it is not, put it into an earthen pipkin, place it on a clear fire and boil it gently, stirring it from the bottom with a brush.

I prefer this starch paste to every other adhesive substance; but if I have none prepared when I want to mount a proof in a hurry, I mix some dextrine with warm or cold water, and mount the proofs with that.

If you have many proofs to mount, lay them, face downwards, in a pile on your glass plate, and apply the paste evenly over the back. The paste must be applied freely, as the proof absorbs a good deal of moisture; when the first proof is covered, remove it, lay it aside, and proceed with the second as with the first, to the extent of about a dozen. Have your mounting-paper ready, and apply the first proof to the place previously marked on the paper to receive it. Smooth it down with a clean cambric handkerchief, so as to press out all the superfluous paste; then with a piece of clean wet sponge rub over all the surface of the proof and mount, and dry up the superfluous moisture with blotting-paper. By this mode of treatment *cockleing* will be avoided.

When dried, the proofs will require glazing. The best mode of putting a gloss on them, is by the rolling press; but when one is not of convenient access, then they may be pressed out with a tailor's goose, first covering the proof with a piece of fine smooth paper. If the proofs curl up after this operation, they should be put in a press or under a heavy weight, and kept there all night.

Sometimes a very high glaze is required. This may be obtained by applying a varnish composed of the white of an egg, to which a solution of gum-arabic is added; it is applied to the proof by means of a piece of sponge. Gelatine is also employed as a varnish, which is prepared as follows:—

Fine gelatine	10 drachms.
Gum-arabic	2 „
Water	12 ounces.

Dissolve the gelatine in half the water made hot, and the gum-arabic in the other half, and add them together. This varnish is also applied with a sponge. When quite dry the proofs must be rolled and pressed. A varnish which is recommended for its antiseptic and preservative qualities is composed as follows:—

White wax	10 drachms.
Oil of lavender..........................	10 „
Oil of cloves	2½ „

These ingredients should be placed in a covered pot beside the fire until dissolved, and afterwards kept from the air. A small quantity, taken on a piece of flannel, may be rubbed evenly over the proof, when a fine lustre is soon obtained by friction.

Proofs may also be varnished with Canada balsam, applied with a soft brush; or mastic, or dammar resin varnish are sometimes employed, according to the fancy or predeliction of the artist, but some kind of previous sizing is necessary. Of those varnished with wax, it may be said that it preserves the proofs quite free from spots or stains, and to that I always give the preference next to albumen.

As to the quantity of margin left on the mount round the picture there is one remark to be made — the greater the quantity of margin the smaller the images in the picture will appear; so the quantity of margin may be determined by the effect of size intended to be produced. As a general rule, the quantity of margin above and below the proof should be about one-half the breadth of the picture, that is one-fourth above and one-fourth below; the margin at the sides should slightly exceed these proportions.

If the proofs are to be kept in a portfolio nothing more remains to be done; but if they are to be framed, they must be surrounded with as simple and as small a gilt frame as possible — treated, in fact, like engravings, not like paintings. It is a common error to put engravings into elaborately carved gilt frames, which completely obscure the design, and distract the eye from the object presented to it, whereas nothing more is required than a simple gilt beading as a mere accessory ornament, and to give a finish to the appearance of the work of art.

Photographic Glossary.

Exposure — The presenting a sensitive surface to the action of light either in the camera or in the printing frame. The time of exposure is one of the most difficult things for the photographer to determine, as he possesses no ready means of measuring the degree of actinic intensity in the rays of light, hence his picture incurs the risk of being *under* and *over*-exposed. Of the two, over-exposure is the least detrimental to ultimate success.

Ferrotype — The name bestowed by Mr. Hunt on a class of pictures, into which iron salts enter as an element.

Ferrid-cyanide of Potassium — A salt commonly known as red prussiate of potass. It is obtained by the action of chlorine upon ferro-cyanide of potassium (yellow prussiate of potass), under the form of ruby-red prismatic crystals. It is employed in certain photographic processes.

Ferro-cyanide of Potassium — Yellow prussiate of potass; it crystallizes in four-sided tables, derived from a primary octahedron. It is obtained from animal refuse, such as horns, wool, hoofs, &c., by burning them in an iron pot, and lixiviating the residue with water. This salt is sometimes employed as a photographic agent.

Filtration — The method of separating insoluble matters from a liquid by means of *filters*, which consist of paper, sponge, or other porous substance.

Fixing — The means employed in photography to render the image permanent, by removing those portions of the sensitive salts unacted upon by light. The fixing agent commonly employed is hyposulphite of soda; cyanide of potassium is also used for the same purpose, with collodion negatives; also, ammonia with paper positives.

Fluorescence — A term applied by Professor Stokes to designate a property possessed by certain substances of arresting the chemical rays visible or invisible, and rendering the latter visible.

Fluoride of Silver — A compound of fluorine and silver; soluble in water. It has been recommended as a photographic agent, and is constantly prescribed in various formulæ. But in paper processes the fluoride of silver is washed out, and does not remain to produce any photographic effect. As it is supposed to possess some accelerating influence, it would, if used at all, be better to add it to the water employed in the washings.

Fluoride of Potassium — A salt composed of fluorine and potassium. It is very soluble in water. It is used, like the other fluorides, as an accelerating agent.

Fluorides — Combinations of fluorine with metals, &c. The principal fluorides employed in photography are those of ammonium and potassium.

Focimeter — An instrument invented by M. Claudet for ascertaining the chemical focus of an achromatic lens.

Focus — The place at which the rays passing through a lens unite to form an image of the object before which it is placed. In a simple lens, the visual and chemical foci do not coincide.

Fogging — A collodion picture is sometimes rendered semi-opaque over its whole surface upon the application of the developing agent by which the details are veiled or obscured. Such an effect is termed 'fogging;' it arises from deficiency of acid in the developer; from light accidently falling upon the whole sensitive surface of the collodion, or from decomposition of the chemicals employed.

Gallates — Combinations of gallic acid with bases. Gallate of lead is said to be an energetic developing agent.

Gallic Acid—An acid obtained from gall nuts, of a grey or yellowish white colour, in the form of fine needles: one

part requires 100 parts of water at 60° to dissolve it, boiling water dissolves three parts; it is much more soluble in alcohol. The solution of gallic acid readily reduces the salts of silver, especially in the presence of light, or when they have become modified by its action, which property renders it a valuable agent for developing photographic pictures.

Gelatine — An animal substance obtained from skins, bones, &c., soluble in boiling water, which upon cooling gelatinises or takes the form of jelly. Isinglass and glue are the usual forms of gelatine. It is used both in the negative and positive processes of photography.

Glucose — A name given to sugar of starch, which may be obtained by the action of boiling water slightly acidulated with sulphuric acid upon starch. It reduces the salts of silver, and may therefore be employed as a developing agent. It is considered identical with grape sugar.

New Books.

The Principles and Practice of Harmonious Colouring, in Oil, Water, and Photographic Colours, especially as applied to Photographs on Paper, Glass, and Silver Plate. By an Artist Photographer.

(London: James Newman, 24, Soho Square,
And Cassell, Petter, and Galpin, La Belle Sauvage Yard.)

It is pretty notorious now, whatever may have been the case a year or two ago, that the ordinary occupation of the miniature painter is well nigh gone. With all its faults, a photograph of a beloved relative or friend must be preferred to an indifferently executed miniature, for many obvious reasons, two of which are generally paramount with the public, viz., comparative cost and comparative convenience attendant upon the requisite "sitting." For miniatures of a higher class, such as are truly works of art, the acquisition of them is not even to be thought of by the masses of the population; their producers, therefore, have, we think, done wisely, in turning their attention to the finishing of photographs, by the aid of colour, in the style of miniature paintings.

Now, although an artist may be skilful in the ordinary walks of his profession, it does not follow, that without experience in the colouring of photographs, he could readily accomplish the feat satisfactorily on his first essay; any reliable guide, therefore, to enable him to acquire the necessary experience with a minimum expenditure of labour, must be regarded as a boon by him, and such we have no hesitation in pronouncing the work now before us.

The embryo artist will also find much valuable information, and though the work is evidently from the pen of one well acquainted practically with the subject on which it treats, no unreasonable promises of a royal road to success are held out; but by careful attention to the rules laid down, even a novice will find his path made less difficult.

There are minute technical details relating to every one of the methods usually employed in colouring photographs, and the author is evidently one who considers that a photograph is applied to its highest use when serving as a basis for painting.

There are some excellent introductory remarks relative to the nature and harmony of colours, based upon strictly scientific premises, and the whole is evidently written with the intention of communicating sound and practical information upon the subject treated of, and that in a straight forward and intelligent manner.

In a work of this kind it would be useless to attempt giving a sample of the instructions laid down, but the following extract from the introduction may serve to convey a notion of the author's style:—

"Presuming that the majority of the readers of these pages are photographers, professional or amateur, themselves producing the pictures they wish to colour, we think it desirable, at the outset, to urge upon their attention the importance of greater artistic culture than most of them have hitherto possessed, or deemed necessary. A cardinal blunder with them has been, the supposition that a good photograph must necessarily be a perfect representation of nature, and that such an imitation of nature as the photograph presented must be the highest triumph of art. Passing by, for the present, the first assumption, or for the moment for argument's sake, admitting it to be true, we must submit that nature has many aspects, but not all equally beautiful. As regards portraiture, the living model is seen in ever-shifting positions, and ever-varying aspects of light and shade, very few of which, however, it may be, would be suitable for portraiture, notwithstanding that they are all natural. That a portrait should be what some call natural does not, therefore, by any means imply that it is perfect as a picture. It may be natural, that a person should at some time wink, smirk, or frown, that he should occasionally stoop, loll, or stretch himself; but no one would for a moment dream of perpetuating these actions in a portrait. Notwithstanding, we have seen many photographic portraits in positions little better. Sitters placed upon a chair bolt upright, with head, body, and limbs in one line, a hand thrust forward sprawling on each knee, all arranged with such accuracy, that if the figure were cleft down the middle, the halves would weigh the same to a fraction! The expression accompanying this position being generally either one of the most listless fatuity, or with every muscle on the strain, the eyes glaring, and the features contracted to a most diabolical frown, the idea is conveyed, that the sitter is just gathering his energies for a fatal spring upon some victim. Others, again, carefully avoiding these enormities in arranging the sitter, affect positions of unstudied ease and carelessness, in which, however, every thing like grace or dignity is alike wanting.

"Nature, then, having such varied aspects, the aim of the true artist is to portray her in such aspects as best secure the *embodiment of character* in the model, combined with pleasing pictorial effect. It is here the painter possesses a great advantage over the photographer.

"The photographer must not only give up his favourite notion that he has only to depict nature to succeed, but also that the most perfect photograph is necessarily an accurate reproduction of nature as she is seen. The best product of the camera, unaided by art, is often very far indeed from being a transcript of nature. The principles of photography, both chemical and optical, combine to render this inevitable. The intense photogenic action of some colours, and the almost entire absence of such action in others, chemically, and the necessary undue enlargement of advancing objects and diminution of retiring ones, mechanically, combine to remove the photograph as far from nature as many imagine the painting to be; the difference being, that whilst it is the province of art to soften peculiarities, photography very often exaggerates them. The incipient wrinkle or trifling scar, which in nature is, it may be, hid by the brilliancy of complexion; the slight freckle, which to the eye varies so little from the general tint of the skin, as scarcely to excite observation, are at once searched out by the one huge cyclopean eye of the camera, and rendered with uncompromising distinctness in black and white. The red or golden tresses appear with raven blackness, whilst the blue eye, which in the photograph is as colourless as water, seems to have lost in depth of colour what the hair has gained. The most enthusiastic photographer has often felt his failure here, and has here acknowledged, that the aid of art, in colouring, is pre-eminently needed. Again it is a principle of art that the most important part of a picture should be best done, that in a portrait other parts should be so subordinated as to give due prominence to the head: and herein it is true to nature. It is on the faces of those around us we look, whether we speak or listen; it is there we look for the varying expression and developement of character, and it would speak little for any of whom, in their absence we remembered more of their dress than face. Photography, however, in its most perfect forms knows no such discrimination. Every button, fold, and flounce, is distinctly portrayed; the varying texture of silk or satin, velvet or cloth, is rendered with surprising accuracy; whilst the head, if not certainly worse done than the rest, is certainly worse in proportion, so that it appears no more important than, if not really subordinate to, the other parts of the picture. A painting of this description once under criticism, received its due meed of praise; the several parts were separately commended, the position, the draperies, &c., after which the critic exclaimed: 'Why, bless me, here's a head too!'"

The book is illustrated by a useful coloured diagram, exhibiting the relations of the primary, secondary, and tertiary colours.

Foreign Correspondence.

Paris, March 10, 1859.

We are just now very much interested in "bottled" light, and M. Nièpce de Saint Victor, in order to assure those who wish to repeat his experiments, has given a more detailed account of his method of operating, in order to enable them to obtain success. To prepare the solarised paper he proceeds as follows:—Take a piece of white card-board and immerse it for a sufficient length of time in a solution of tartaric acid, or of nitrate of uranium; tartaric acid succeeds the best. Expose the cardboard to the direct rays of the sun for four or five hours in summer, until it is saturated with light; this can be ascertained by dropping a little nitrate of silver upon it, which instantly blackens the card where it comes in contact with it. Then take the cardboard, roll it up, and place it in a tin box, and solder it so as to hermetically seal it. The card will now retain its solarising properties for an indefinite time.

When it is desired to exhibit the effects of stored-up light, some positive paper should be prepared with ammonio-nitrate of silver, which is more sensitive than the chloride. When the sealed tube is opened at the time of operating, a little water must be injected, for the purpose of damping the cardboard; but no water must be left in the tube, which must then be re-covered as completely as possible, and warmed in the flame of a spirit lamp until it has attained a temperature greater than the hand can bear, which is from 140 to 160 degrees Fahrenheit; it is then opened, and immediately applied to the negative (which is taken on thin paper), in contact with the sensitised ammonio-chloride paper.

Cardboard, impregnated with nitrate of uranium, requires only an hour's solarisation; but it loses much more rapidly the luminous action it acquires.

M. l'Abbé Despratz, to whom photographers are so much in-

debted for a rational mode of working dry collodion, has recently published some further remarks on the preparation of gun-cotton and collodion, in continuation of those he gave to the world about a year ago. He is of opinion, that gun-cotton properly made and well-kept, may be preserved for an indefinite time without undergoing any alteration. To secure this result, much depends upon very perfect washing, and upon keeping the gun-cotton enclosed within several envelopes of bibulous paper, with free access of air. He disputes the English notion of the effect of preparing gun-cotton with acids at high temperatures. He has found, that in winter as well as in summer, the chemical combination of the sulphuric acid and nitrate of potash always developes the same given temperature, which is sufficient to act effectually upon the cotton. It is important in the preparation of the gun-cotton that the mixture of acid and salt should be of a syrupy consistence; there is then no fear of an excess of nitrate of potash. The cotton must be immersed immediately the mixture of acid and salt is effected, before the sulphate of potash formed has had time to thicken the mixture. There is still another and a more important reason for proceeding promptly in immersing the cotton, which is, that its transformation into pyroxyline, goes on only during the liberation of the nascent nitric acid given out by the decomposition of the nitrate of potash. Now the elimination of this acid, which is manifested by much violence upon the first contact of the sulphuric acid with the nitrate of potash, gradually slackens; it is most effective during the first ten minutes, and this space of time is necessary to produce a complete transformation. It is always best to operate with small quantities of cotton: fifty or sixty grains is a very suitable quantity.

M. Despratz is of opinion, that the quantity of gun-cotton required to make a given quantity of collodion, need not be rigourously weighed. He proceeds in the following manner—Into 100 *grammes* of good, but non-rectified ether, he puts three or more *grammes* of gun-cotton; at the expiration of an hour, the gun-cotton, after being moved about with a glass rod, falls to the bottom of the bottle, without being really dissolved. Now add to the mixture a few *grammes* of rectified alcohol (not absolute). The cotton soon becomes dissolved; more alcohol may be added if the solution is not complete—but it must not exceed in weight one-fifth, or one-sixth, of the ether employed. If this quantity is exceeded, the strength of the alcohol must be greater. After allowing the mixture to rest for twelve hours, the upper portion is carefully decanted from the cotton that remains undissolved. The collodion thus prepared will most probably be found too thick; it must, in that case, be diluted with ether—but no alcohol, until the desired consistency is attained. It must not be forgotten, however, that collodion becomes thinner after being kept a few days than it is at first. A thin collodion is the best to work with, under all circumstances. Collodion that becomes milky, shows that it has been prepared with bad ether, or with alcohol of low strength. After all that has been said about iodising collodion, the Abbé thinks that perfection may be attained by simply employing iodide of potassium. He prepares his iodising solution as follows:—Put ten *grammes* of alcohol into a bottle, and saturate it with equal quantities of iodide of potassium and iodide of cadmium, both quite dry, and finely pulverised. At the expiration of a few hours, the solution will be effected, and the proof of complete saturation will be found in some of the iodides remaining undissolved at the bottom of the bottle. This mixture of iodides and alcohol may be made at the same time as the collodion is prepared, so that they may both be ready together. Into the decanted collodion, put, say ten drops of the iodised alcohol, which, of course, will not be sufficient, but will serve for experiment. Take a slip of glass, carefully cleaned, and cover it with the iodised collodion, and then immerse it for one or two minutes in the nitrate of silver bath; upon withdrawing it, the colour of the collodion film will indicate how near the proper iodising is attained. Viewed by reflected light, the colour of the film ought to be *blueish opal;* if it is merely *blue*, it shows that the collodion is not sufficiently iodised—if *white*, that it is too much so. By carefully adding fresh iodising solution to the collodion, and testing as before, the exact degree will be arrived at, and a picture may now be taken upon the collodion in the camera. This proof will be worth nothing: it may be covered with transparent and opaque spots; but the black portions of the picture will show if the proper degree of iodising has been attained. These spots in the collodion film are evidently due to insoluble portions held in suspension, which cannot be effectually removed by filtration. The insoluble particles must be allowed to deposit themselves gradually: and much time is required for that result; and the colour of the collodion, which gradually changes, affords a very good test as to when this deposit is complete. At first milky, the iodised collodion becomes gradually of a pale yellow; this yellow colour gradually becomes deeper, until at length it is that of olive oil. This is effected in about four-and-twenty hours. With some collodions, perfect transparency is not attained under four, or even eight days; the collodion carefully decanted, may now be used with confidence. Besides the deposits due to undissolved gun-cotton, and to the impurities of the iodides, there is another which sometimes appears, of a white, starchy appearance. This deposit, which must not be removed, is merely iodide of potassium, precipitated from its alcoholic solution by ether. After decantation, it must be re-dissolved by just sufficient alcohol, and then added to the iodised collodion. This deposit usually takes place when the ether is too highly rectified: such an ether should never be employed, as it gives negatives, deficient in harmony, from the *blacks* of the picture being too dense, while the half-tones are scarcely brought out.

The Abbé next proceeds to examine the constitution of the collodion film on the glass plate. He finds, that under the most favourable conditions, this film is not completely uniform and homogeneous, but really composed of two distinct layers, one adherent to the glass, the other superimposed upon it. The first in only pyroxyline—that is, normal collodion, with very little iodide; while the second is composed almost entirely of iodide and very little pyroxyline. There is, therefore, a mechanical separation of the constituent principle of the collodion, due to the rapid evaporation of the alcohol and ether from a large surface. An effect is in this way produced, similar to that which occurs in the drying of paper which has been sized. M. Payen has shown, that the size introduced uniformly into the substance of the paper, when dried in the air, is found on each surface, but not in the interior of the paper; and, for a perfect sizing of the paper, a combination of favourable circumstances is required, in which air, heat, and moisture, play the principal part. The iodides in the collodion are brought to the surface of the layer, opposite to the glass plate, in the same manner that the size introduced into the paper finds its way to the surface; and as paper is only really well-sized in proportion as the size is at the surface, so collodion will only be well prepared in proportion as its texture permits of the free motion of the iodides, so that they may reach the surface of the film in contact with the air, and permit of the prompt action of the sensitising and developing agents. Collodion prepared with highly rectified alcohol and ether are subject to a degree of permeability, and should therefore be avoided. J. P.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this* Journal, *should be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

Correspondence.

ALKALINE CHLORIDE OF GOLD TONING.

To the EDITOR.

SIR,—I perceive that a little difference of opinion exists amongst some of your readers, as to the amount of over-printing which is required in the alkaline chloride of gold toning process. May I suggest that the albumenised papers experimented with, were not probably of one quality. Much appears to depend upon the selection of a suitable paper in this process, and if the wrong kind be chosen, such evils as a disappearance of the purple tints, loss of half-tone, &c., on immersion in the hyposulphite, may be anticipated. A paper has lately been made by Mr. Evans, of Nash Mills, Hemel, Hampstead, which takes the gold with unusual facility, and if he can manufacture it of uniform quality, of which I cannot certify at present, it will be a great boon to photographers. I have seen no advertisements of this paper, but it was recommended to me by an artist of great experience, and since then I have received a sample from the proprietor. Thinking that the advantage is with the consumer equally as much as on the contrary side, I do not hesitate to speak favourably of the paper as far as this single sample is concerned, being at the same time fully aware of the difficulty of producing uniformity.

Whilst upon this subject, I may notice in passing that the sketch which you have given of the gradual introduction of this process, is not quite accurate in some minor particulars. The real state of the case I believe to be as represented in the communication to the Society some two months since.

A friend of mine has lately tried Mr. Maxwell Lyte's process, in which phosphate of soda is used, and, as he informs me, with great success. On the whole the results were superior to those which he obtained with the alkaline chloride bath. The quality of the negative has much to do

with that of the print, and with negatives such as he then used, it appeared to him that he secured greater sharpness and brilliancy, by printing very deeply, and afterwards clearing up the lights by means of the last mentioned solution.—Yours, &c.

King's College, March 3, 1859. F. HARDWICH.

"CLEANLINESS IS NEXT TO GODLINESS."—*Old Proverb.*

To the Editor.

Sir,—A short time ago a lady said to her friend, who was paying a morning call, "And do you know, my dear, Arthur has caught that nasty epidemic they call photography?" "Indeed, I am sorry to hear it," was the reply, "has he it very severely?" "Yes, that he has; I fear he will be badly marked."

Now, Mr. Editor, this introduces a matter we ought carefully to consider. So long as a photographer only marks himself, his own clothes, and his own carpets, he is simply a domestic grievance: when he enlarges the sphere of his labours, and visits his friends, marking their clothes, their tables, and their carpets, he becomes a bore: but when he turns out into the world on his photographic rambles, and takes rooms at hotels, leaving behind him traces of his progress, on the floors and tables, he becomes a public nuisance, and ought to be put down. In the good old times of "waxed-paper" we used to travel about with camera and legs, taken by unsuspecting landlords for railway surveyors, telegraphic agents, or some such beings: after dinner we used to call for the hostler to bring a large jug of rain water and a stable bucket, and spreading a newspaper or two on the table, unpack our chemicals, and develope our pictures; and I never recollect a single instance in which I left a stain on table or floor. But some photographers are, either more careless or more unfortunate, so that now, hotel keepers, if they see your legs and camera, either say they have no rooms at liberty, or put you in some miserable place, where you see the sad traces of some previous professor of the "black art." Some time ago, I was in company with my friend, the discoverer of the "great gin and water process."* The train dropped us at a station in the north, near a celebrated abbey. My camera and stand were packed up to look as much like fishing tackle as possible, but my friend's camera and legs were not disguised. The porter took our luggage to the hotel, where we encountered a very polite waiter at the door. "Can we have good rooms?" said I. The waiter gave a withering glance at the legs and camera, and said he must call the landlord. Oh! for a fairy's wand, to transform our apparatus into something else, even into the stock-in-trade of a travelling tinker; but there was no such luck—we must face it out. Well, the landlord came; looked at the legs and camera, and then at us, and said—"You must excuse me, gentlemen, but really I have suffered so much from them sort of things. If you have rooms, you must promise me faithfully not to make a mess." My friend was so much ashamed, that I really think he would have gone back by the next train, but I said, "Oh, you may trust us, we are dry photographers." Whether he understood my meaning, or whether he had visions of long bills for bottled stout and pale ale, I cannot say, but he at once admitted us, and we had the best rooms in the house.

During our stay, we listened to his photographic grievances, of which he had a long string; how his furniture had been spoiled, and his table covers and carpets spotted and stained all sorts of colours. Two gentlemen from London had been there, on a photographic expedition; when they left he went into their sitting room and found all right, apparently: the next day, sundry large stains made their appearance on the carpet, which bye and bye turned into sundry large holes. We strongly advised him, before we left, to look very shy at all photographers, unless they were *dry* ones.

Now, Mr. Editor, I think you will agree with me, that there is no occasion for all these messes: every photographer ought to learn to take pictures without either staining fingers or any thing else, and until he can do so ought not to be admitted into a respectable hotel. What do you think of a grand central photographic hall, where all photographers must take their degree before they can practice? or if that plan would be too costly, that Justices of the Peace be empowered to grant licenses, on the applicants proving their fitness, by bringing all necessary materials to the Justice's house, converting his library into a dark room, and taking at least six good collodion pictures without making a spot; the police being instructed to put in jail any photographer travelling without a licence.

I merely give you these as suggestions; but *something* must be done, or we shall have notices put up at the entrance of every village—

ALL VAGRANTS OR PHOTOGRAPHERS

ENTERING THIS VILLAGE, WILL BE

PROSECUTED WITH THE UTMOST RIGOUR OF THE LAW.

Yours, &c.

Manchester, March 10, 1859. JOB TROTTER.

* I may just add, that I am not *the friend* he alluded to, who complained of the solution not keeping.

PRINTING DIFFICULTIES.

To the Editor.

Sir,—Would you kindly tell me in your very valuable Journal, what effect is produced by using an old nitrate bath for floating paper on; of course there must be a very large amount of nitrates of soda or baryta, or whatever the paper is salted with, which will increase as water and nitrate of silver are added to make up for diminution. This is a point which I am sure your able pen would clear up; and as I am convinced some failures have arisen from this cause, you would receive the thanks of many photographers, including your very obliged correspondent.

I am, yours, &c. T. C. D.

[By an *old* nitrate of silver bath, we presume you do not mean one that has been used for negatives, but only that has been in long use for exciting printing papers. If the former, it contains alcohol and also iodide of silver, and these would be detrimental to a great degree. In this case you had better throw down all the silver in the shape of a *carbonate*, by adding excess of solution of sesqui-carbonate of soda (in *distilled* water), and re-dissolving the precipitate (after washing) in dilute nitric acid.

The same course of proceeding may be adopted, if necessary, even if the bath be only such as has got much out of order, by floating papers thereon; but in all probability your troubles arise not from preponderance of nitrate of potash, &c., so much as from deficiency of nitrate of silver. Remember, that each sheet of paper floated upon a bath *abstracts* nearly *double* the quantity of the silver salt indicated by the quantity of liquid removed; hence the constant reduction in strength of the silver bath, until at last it becomes too weak to give presentable pictures with any amount of time for contact with the papers. The fact of this reduction in strength has been demonstrated beyond the possibility of doubt, by Messrs. Davanne and Girard, even did not our own practice prove the same.

Organic impurities are readily removed, by a few drops of citric acid, as suggested by Mr. Eliot, correcting the acidity engendered by subsequent addition of a few drops of carbonate of soda solution.

You should ascertain by direct experiment, the quantity of nitrate of silver now in the bath by precipitation with a chloride from a given quantity, drying and weighing the chloride formed.—Ed.]

A DRY SUBJECT.

To the Editor.

Sir,—I hope you will not consider the following question irrevelant.

In taking pictures by J. W.'s gin and water process, will not the best and most appropriate diaphragm be the "bottle?"—Yours, &c.

Manchester, March 2, 1859. PHOTO.

PRINTING DIFFICULTIES, &c.

To the Editor.

Sir,—Would you kindly tell me in your very instructive and able Journal what is the best paper to use—1st, For simple salting, and 2nd, For albumenising. ———'s albumenised is in my hands extremely unsatisfactory; the picture after fixing and toning is weak and wanting in depth and brilliancy, although I use an eighty grain sensitising bath of nitrate of silver. It cannot be in manipulation, as I succeed admirably with paper I prepare myself, or with Spencer's albumenised, which, with an eighty grain sensitiser, is magnificent, but somewhat expensive.

Will you also tell me where I could get a good detailed account of the meta-gelatine process, which Mr. Heisch so much praises in your last impression.

Many thanks for your past favours to me and my friends; you do not know how eagerly we look forward to the publication of your Journal, it contains so many new "dodges," and is a source of enlightenment to the whole photographic world.—Yours, &c. JABEZ JARBER.

[We have sometimes found the same fault of which you complain with the paper named by you, but chiefly when it has been only *lightly* albumenised, or when a delicate but not intense negative has been employed. You will, we think, be able to remedy the defect by allowing the sheet to remain in contact with the sensitising bath a longer time, or by using the bath still stronger. This of course applies if you happen to have a stock of the objectionable paper, if not, use some other kind.

The choice of a paper for salting and for albumenising, depends also upon the special purpose to which you desire to apply it. For portraiture, we prefer as a plain salted paper, a *thick* kind of Saxony paper (sized with starch), sold by Messrs. Knight & Son; Sanford, and other dealers, or else Messrs. Marion's, which they call *helio-velin.* For landscapes we prefer an English paper, in preference Hollingworth's thick paper, next the same maker's thin, or Harrison's paper, these two last being about equal in value, then Towgood's.

For albumenising, any of the preceding may be used, but we think the preference may be given to Harrison's, or Hollingworth's thin paper.

Canson's paper when good is very good, but the *thick* paper is what we mean.

You will find the process alluded to by Mr. Heisch in No. 76 of the *Journal of the Photographic Society.* Mr. Heath, of the firm of Murray and Heath, Piccadilly, may be able to give you the formula as originally recommended by the Rev. Mr. Cleaver.

Thanks for your good opinion.—Ed.]

CARBON PRINTING.

To the Editor.

Sir,—Having bought a ticket in the Pouncy lottery, and drawn a *blank*, I wish to know if any gentleman has succeeded in getting a *prize*. If so, would he kindly favour me with the particulars of his manipulation.

As to getting the picture out by soaking, I believe that to be impossible. I succeeded in getting something like a print, by putting the paper on a glass plate, and holding it under a tap, with a water pressure of about 20 feet, but even with that I could not get the lights clear. I think, that the next best thing to try will be a jet from the town fire engine.

If permanent prints are wanted, let me advise the general adoption of the old ammonio-nitrate process. I have a print by me printed by that process in 1847, which is now as good as ever, and as it was considered an inferior print, it received but very little washing, and that in the waste hot water from a steam engine. It is printed on old satin post writing paper, and has not been protected by a glass, but generally pinned against the wall in various places, damp and dry. Should you like to see it I will send it for your inspection.—Yours, &c.

Mansel Street, Swansea. THOS. GULLIVER.

[We can vouch for the fact that all are not quite so unfortunate as our correspondent, though we have not yet seen reason to give up silver printing.

Instead of its being sent for *our* inspection, we will beg the owner to present it to the Photographic Society, to form one item of the collection illustrative of the progress of the photographic art from its earliest date.—Ed.]

Mr. BURNETT and Mr. HANNAFORD.

To the Editor.

Sir,—In the last number of the Photographic Society's Journal, I observe a letter from Mr. Burnett in which he claims to have published the principle of the iron printing process, as practised by me, in the November 22nd number of that publication, and on reference—for I had not previously seen his remarks thereon—I find that he is quite correct in his statement.

The process however is quite original on my part. Indeed you may remember that on the 24th November, that is only two days after Mr. Burnett made his process known, I exhibited some prints at the meeting of the North London Photographic Association in your presence, and that one of the Committee had seen these specimens fully a week before. Up to that date (the 24th), I had not read Mr. Burnett's numerous papers, but from some remarks, *then made by yourself*, my attention was called thereto, and I gladly admit that I have since greatly benefitted by his interesting researches.

It is to be regretted that much of the very valuable information which Mr. Burnett has from time to time given us is so likely to be overlooked, from the fact that it is distributed among so many Journals.

I trust both Mr. Burnett and yourself will acquit me of having copied this process, and given it out as original.—Yours, &c.

Stoke Newington, Feb. 24th, 1859. MICHAEL HANNAFORD.

[We have already personally expressed to Mr. Burnett our conviction that you are free from any charge of plagiarism; and are fully impressed with the merit of his suggestions.—Ed.]

PHOTOGRAPHIC BATHS FOR TRAVELLING.

To the Editor.

Sir,—In the last number of a contemporary, is a letter from Messrs. Forrest & Co., stating that they are about to make moulds for glass baths. Perhaps a few hints from a travelling photographer may be useful.

The three landscape lenses now in most general use cover pictures of the following sizes, 12×10, 10×8, and 9×7, below or above these sizes are not so much used.

As these are the actual sizes of the picture, it is getting general with photographers to have the glass plates an inch longer each way, so as to allow a margin for the rebate of the slides, the thickening of the collodion film, and any blemishes at the edges; thus the sizes of the *plates* become 13×11, 11×9, 10×8.

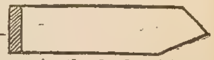
Very few photograpers travel with a glass bath, partly because of the baths not fitting the above sizes, but chiefly on account of the immense weight and quantity of liquid they contain. A glass bath for plates 11×9, as now obtainable, is absurdly made $1\frac{3}{8}$ inch clear width, so as to require nearly six pints of liquid; for the stay-at-home photographer, quantity and weight are of no importance, but they are a bar to travelling purposes. Now to keep down this quantity of liquid, the baths should be made V shaped, as first brought out by the late F. Scott Archer, and it will be quite sufficient for all purposes to have them $\frac{3}{8}$ of an inch clear width at bottom, and $\frac{5}{8}$ clear width at top; thus made, a bath for plates 11×9 would require less than two pints of liquid, and would then become something manageable for travelling operators. This $\frac{5}{8}$ clear width at top is ample and more than ample for even a clumsy operator.

When the bath is inclined for use, one edge of the bath at top is lower than the other, and about half an inch in depth of bath is lost by this; the step at foot of the dipper entails a loss of another half inch, and to prevent overflow, and allow for waste of liquid in a day's excursion, another inch of depth should be allowed. Thus the inside of the bath should be two inches deeper than the longest side of the plate.

For the three sizes of plates I have mentioned, the baths would then be by *inside* measurement:—

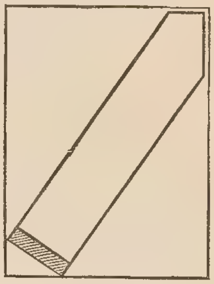
No. 1. $11\frac{1}{2}$ wide $\times$ 15 deep, $\times$ $\frac{5}{8}$ wide at top, and $\frac{3}{8}$ wide at bottom,
No. 2. $9\frac{1}{2}$ " $\times$ 13 " $\times$ $\frac{5}{8}$ " " $\frac{3}{8}$ "
No. 3. $8\frac{1}{2}$ " $\times$ 12 " $\times$ $\frac{5}{8}$ " " $\frac{3}{8}$ "
No. 4. 5 " $\times$ $9\frac{1}{2}$ " $\times$ $\frac{5}{8}$ " " $\frac{3}{8}$ "

The tops to be ground level so as to be fitted with water-tight covers if required.

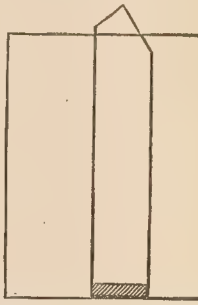
The dippers should be made of glass, thus:— 

with the top end so pointed as to lay cornerways in the bath with the cover on, as here shown.

AS PACKED UP.



AS IN USE.



By this means every thing packs up quite securely, and the trifle of shake is not sufficient to break either bath or dipper in travelling.

The best case for a glass bath is not wood, or metal, or cork, but gutta percha, wrapped round while hot, so as to cover the glass all over, adding a thick band round the top for the clamps to pull against. Should the bath fall down and crack, it is nearly as good as before, for there being no space between the glass and the gutta percha, the liquid cannot escape; but a glass bath simply dropped into a wooden or gutta percha one is useless if cracked, for then away goes the greater part or all of the solution.

The India rubber of the bath cover must not be vulcanised; the sulphur comes off in the bath and does much mischief.—Yours, &c.

London, March 2nd, 1859. A TRAVELLING PHOTOGRAPHER.

ANSWERS TO CORRESPONDENTS.

☞ We must remind our correspondents, that if they send their letters on *editorial* matters to Liverpool, a delay in publication or reply may and sometimes must be the consequence.

—— We have received, from an *unknown correspondent*, a beautifully executed portrait of a lady, standing, well posed, and nicely printed. It was addressed personally, and forwarded from the Photographic Society's Rooms, Coventry Street. We regret that we cannot thank our correspondent by name.

Kate R. R.—Your signature to the former communication misled us, the two last letters having been mistaken for B., so that the reply under that head *was* intended for you. Our present leader will give you the information required. In stating that the other was a mechanical mixture, we were referring to its mode of manufacture, not to its chemical composition.

James Jones—1st, Iodide of cadmium. 2nd, Iodide of ammonium.

Inquirer—Albumenised paper varies very much in quality, especially as regards its property of retaining its colour unimpaired after being sensitised. We think this is due more to the paper than to the albumen generally.

John Glover.—We have mentioned the fact, that you have no connection with your namesake to whom allusion is made in our Leader.

A Subscriber—Collodion pictures have been taken on paper by attaching the latter first (with a little gum round the edges) to a sheet of glass, and then proceeding as in the ordinary way, only pouring the collodion on the paper. To transfer collodion pictures from glass to leather, pour over the collodion alcohol, having four or five drops of nitric acid added to each ounce; then press the leather closely to expel air bubbles, and allow it to dry, when the collodion can be removed adherent to the leather. This is not from our own experience, never having practised the transferring process.

It has been *asserted*, that pictures have been taken by accident with the natural colours; but they have never *remained* in that condition after drying. M. E. Becquerel procured something of the kind upon chloride of silver, prepared in a peculiar manner, but was quite unable to fix the impression, which faded gradually, even from the effect of artificial light, by which alone they were viewed.

M. Becquerel's paper on this subject may be found in our last volume.

In-quest.—We must beg your patience till our next, as we have not room for a proper reply to you in this number.

Received.—"A. M'Nab," "J. S. Moon." Unavoidably postponed.

THE PHOTOGRAPHIC JOURNAL.

No. 91, Vol. VI.—APRIL 1, 1859.

In a letter from our Paris correspondent, dated 22nd February, which appeared at page 62 of the present volume, we learned that Mr. Wheatstone was invited to witness the experiments of M. Nièpce de St. Victor in the application of light that had been sealed up since June last, for the production of a photographic impression. On inquiring for further details of the experiments said to be so successfully performed, we find that a little water was on opening the tube first projected into it, and immediately thrown out again, the cover replaced, and the tube heated over a spirit lamp before its orifice was applied to the printed paper acting as a negative over the ordinary sheet of sensitive paper. It is stated that an impression was the result, and we have no doubt such was the fact; but there is *no evidence*, absolutely none, that the impression was due to the action of *light*.

Let us, however, look a little further: Mr. Crookes has stated that he repeated M. Nièpce de St. Victor's experiments, omitting, however, the *insolation* of the paper—rather an important omission it will be allowed—but, marvellous to relate, the results were just as marked as those of the illustrious foreigner, the impression being made as well, without the "bottled light" as with it.

In a recent number of *Cosmos*, edited by the Abbé Moigno, a translation of Mr. Crookes's account of his experiments is given, and the following droll comment appended:—

"Evidently Mr. Crookes does not correctly interpret his experiment, and wrongly (!) concludes that *in M. de St. Victor's tubes* it is not light which acts. What does this experiment in fact prove? That heat produces in *Mr. Crookes's* tubes the same effects that M. de St. Victor attributes to light—nothing more or less." Quite sufficient, we imagine, to satisfy any reasonable mind that the action has been *attributed* to light without sufficient foundation, that is, if Mr. Crookes has stated correctly his experiment—a fact of which we entertain no doubt whatever.

The projection of the water into the tube, and afterwards converting it into steam, of course at once suggests the possibility, not to say probability, of chemical action, *exclusive* of actinic force; and with a piece of printed paper only as a negative, there is no impediment to the chemical or physical action of the *vapour*, except in those parts where *the oleaginous nature of the printing ink* intercepts the passage of the aqueous particles.

It must also be borne in mind that sensitised chloride paper becomes discoloured in the dark, with a rapidity and energy directly proportioned to the heat and moisture present. The experiments of MM. Davanne and Girard leave no room for doubt on this point; and it appears to us far more logical to presume that the effect produced arises from a cause admitted to be *capable* of producing it, and which is clearly in a condition for action, than to presume a supposed *new action* of light, of which previous experience gives us no indication, in order to explain that for which existing and well-known phenomena are quite sufficient to supply the *rationale*.

If M. de St. Victor's experiments are worth anything at all, there is no reason why the impression should not be made through a *negative on glass*. There is no difficulty in producing a negative on glass as thin as a piece of card; but supposing even an impression to be made in like manner to that with the printed bill, it must also be shown that a similar proceeding will *not* make an impression without the paper has been previously "saturated with light," before we can admit the correctness of the conclusions to be drawn. Nothing short of this can be satisfactory.

No man, be he ever so learned, is infallible; and if M. Nièpce de St. Victor has made a mistake for once, there are few so well able to afford the admission of it without loss of *prestige*. We suspect, however, that the difficulty does not lie so much with M. St. Victor, as with his admirers amongst his own countrymen.

We had occasion, in our last, to notice the increasing tendency to fetter the use of certain photographic processes and apparatus by restrictive patents—a course which photographers, as a body, should set themselves seriously to keep within due and legitimate bounds. It should be the business of every photographer to assist in defeating all attempts to obtain exclusive privileges in the use of those advantages which have been unreservedly published for the general good. As if to point the moral more particularly, we find our brethren on the other side of the channel just now involved in as pretty a squabble upon a matter of this kind as can well be desired.

So far as we can gather them, the facts appear to be as follow:—

It is but recently that M. Marion exhibited at the meeting of the French Photographic Society a box for the preservation of sensitised paper (a description of which we gave in our last), containing, as a desiccating agent, chloride of calcium. There was no secret made about the matter; in fact, it was alleged to have been produced in consequence of the very practical researches into the *cause* of deterioration by MM. Davanne and Girard. But we remember that, some months previously, M. Cognacq, of Rochelle, was about to exhibit and explain, at the then meeting of the same body, a box, possessing, or alleged to possess, the identical qualification—on his understanding, however, that his so doing would prevent his obtaining a patent, he *abstained* from making the proposed communication. It appears, subsequently, that some sort of protection was obtained by M. Cognacq, but it is not even pretended that MM. Davanne and Girard had any knowledge of M. Cognacq's method of operating; these gentlemen are however admitted to have been independent discoverers of the principle, and they declare that they did communicate it to M. Marion.

M. Marion is accused of having surreptitiously obtained his information of the contents of M. Coguacq's box, the former having had one of them in his possession for about a fortnight. Now comes the extraordinary part of the affair. M. Marion secures, or attempts to secure, *a patent* for his box, identical in principle with that of M. Cognacq's; but not on account of being the discoverer of *the principle*—that is admitted by him to belong to the eminent chemists previously named—so the patent can only apply to the form of the apparatus, if it applies to any thing.

We are not aware of the bearings of the patent laws in France, but it certainly appears as if they were in no more satisfactory condition than our own.

We are not going to enter into this squabble, or pronounce any opinion upon the merits of the contending parties ; but as it affects photographers generally, one thing is abundantly clear—either the public or M. Cognacq must be suffering an injury.

The principle of action being known, the arrangements necessary are so obvious that they cannot fail to occur to any one interested in the matter: witness, for instance, the facts mentioned in a letter from Mr. Church, published in the present number, which will be found amongst our correspondence.

We give, in another column, particulars of a discovery likely to be of service to photography in connection with collodion. It appears that Dr. Schweitzer, of Zurich, has discovered new solvents, not only for cotton but for vegetable substances, and also for silks. These seem worthy of attention and careful examination, with a view to their application either for an economical collodion or for forming a transparent and structureless medium on which the collodion film can be supported instead of glass. The details will be found in a paper by M. Léon Krafft.

We have recently been experimenting rather extensively upon the developement of collodionised plates, either dry or preserved in a sensitive condition by means of honey syrup, and the results have been decidedly satisfactory, so far as Dr. Hill Norris's gelatinised plates or those prepared with honey were concerned.

We were led into the investigation from having, in the earlier part of last February, exposed a few of Dr. Norris's plates under unfavourable circumstances in the Scottish Highlands. In consequence of the temperature being low and the sky overcast, with a dark subject we were induced to make use of the acetate of iron as a preliminary developing agent, following Mr. Hardwich's formula, which directs a considerable quantity of free acetic acid. We had previously employed this agent successfully with syruped plates, but had never before applied it to dry ones. The only difficulty we experienced was in making the solution flow readily over the plate, which had first been moistened with distilled water, the difficulty arising from the volatile nature of the acetic acid preventing the water and developing solution at once combining readily.

Of course we need scarcely remark, that in developing dry plates it is a *sine qua non* that nitrate of silver should be present, and consequently the addition of some free acid to the iron solution is also a necessity to obviate fogging, which would otherwise certainly occur.

The difficulty of making the two solutions combine readily upon the plate demands a considerable amount of manual dexterity in order to avoid stains, and the sudden way in which the image flashes out in parts, leaves the operator under the impression, at the first appearance of these patches, that the negative is hopelessly spoilt. A little patience, however, sets that matter to rights; but then comes another trouble—the developer must be pretty speedily washed off, and it is just as awkward to make the water take kindly to the solution, as it was previously to make it agree with the water.

Another objection we also found to exist to the image thus obtained, on dry plates especially ; its gradation of vigour was not at all under control — it would come just to one degree of intensity, which could neither be surpassed or fallen short of. It is true that by clearing the plate of the iodide of silver, and then using pyrogallic acid solution, with a little nitrate of silver, the image was capable of intensification to almost any requisite extent — but the principal defect consisted as usual in the condition of the half-tones. If the exposure had been accurately timed, all was just what one could desire; but if it were a little over or under exposed, there was no possibility of assisting the result by increased or retarded developement.

We found there were certain advantages, however, in using an iron developing agent, that are by no means lightly to be discarded — amongst them, that about one-half the exposure required with a pyrogallic developer was sufficient to impress all the details of the subject. We therefore set to work with a will to endeavour to remove the various objections, and succeeded to our entire satisfaction. We have much pleasure in laying the result before our readers, and have little doubt that many of them will find it a highly convenient method of operating.

The plate having been removed from the dark slide, is to be placed, face upwards, in a horizontal dish, and sufficient *distilled water* to entirely moisten the whole surface gently poured over it and immediately off again. The plate should then be taken up and attached by the back to a pneumatic holder. The developing solution is then poured on in the usual way, and kept in motion until the image is satisfactory. To prepare the developing solution, take protosulphate of iron one drachm, citric acid four grains, put together in a mortar and reduce to a fine powder, then add four ounces of *distilled water*, and stir until dissolved. This will be found to flow over the plate as readily as simple water, and is easily washed away when done with. Just before using it, a few drops of a pure solution of nitrate of silver must be added to that portion intended to cover the plate; but it should be simple nitrate of silver, containing no iodide, chloride, &c., consequently, some from the exciting bath is not applicable for the purpose.

The reason for this is, that as soon as a portion of the silver becomes reduced by the iron, the remainder is lowered in strength, consequently a part of the iodide previously held in solution is thrown down in the form of a fine powder, and not only is the solution rendered muddy, but the film is soon covered by it, and thus appears minutely speckled all over.

In preparing the developing solution as above indicated, the quantity of citric acid is not a constant quantity, but should be varied according to the temperature ; the criterion being to use as little as possible, but not to use so little that the mixture of the solution with that of the nitrate of silver becomes embrowned under from three to five minutes' time. If on trial it is found to do so, a little more citric acid must be added, until it will retain its limpid appearance for the space of time specified.

This developer, unlike those of the iron preparations generally, *gradually* brings out the image, enabling the operator to arrest the action at any stage he may think proper, and if a little honey syrup be added while developing, a very intense deposit may be obtained without the subsequent use of gallic or pyrogallic acid, as the organic matter required to produce the density desired is supplied by the syrup. The plate may afterwards be cleared and the developement carried still further if thought desirable.

If syrup has been added, hyposulphite of soda should be the fixing agent, cyanide of potassium reducing the intensity so much as to make redevelopement necessary, which is not the case when the hyposulphite of soda has been employed instead.

In working with syruped plates, precisely the same mode of operating may be adopted, only, of course, it becomes unnecessary to add any more syrup to the developing solution, and the hyposulphite only should be used for fixing.

The same distilled water may be used for moistening the surfaces of several plates that are intended to be developed consecutively.

We have not tried this method of operating with collodio-albumen plates, only with those kinds mentioned, but we see no reason why it should not be equally applicable with all dry plates, however prepared.

We have only one more remark to make in connection with this mode of proceeding; if the solution on the plates turns brown before the developement is complete, it must be poured off and replaced by some fresh.

Although we have made use of many words to describe the preceding, it is exceedingly simple; but we like it so well ourself that we are desirous our friends should not be liable to failure from want of any of the minutiæ of details. We have no doubt many will try it, and we shall be glad to be favoured with the results of their experience.

We were not a little startled the other day at reading an advertisement which appeared in one of the daily penny newspapers, to the effect that some Young Ladies were wanted as sitters for stereoscopic subjects, with an intimation where to apply. What inducement is held out to applicants did not appear. We certainly found ourself speculating upon the point as to whether the advertiser is most entitled to admiration for his *simplicity or his cool assurance.* That any young Ladies will be attracted by the impertinent intimation we certainly have no fear; but we cannot forbear protesting against a proceeding that is likely to bring ridicule if not censure upon our professional brethren generally, if such an advertisement be continued.

THE FOTHERGILL PROCESS.

By Alfred Keene.

As the time has now arrived when photographers wipe the cobwebs from their apparatus, look up their "Processes," and prepare in earnest for action, a general detail of the "Fothergill Process," with such additions as the experience of others, and a series of elaborate experiments undertaken by myself, indicate as desirable, will doubtless prove acceptable to your readers, both from the justly obtained extreme popularity of the process and its preeminence *even over the wet,* for taking those charming bits of landscapes (only to be obtained at this season, before nature again clothes herself with rich green foliage), requiring the retaining of distant objects until near ones are well out, and which it performs in a manner *peculiar* to *itself.*

The Glass Plates.

These should be thoroughly clean, equally so as for the wet process. Glass that has been used or obtained from the sheets ordinarily sent out, should invariably be placed, first in a strong solution of soda, and then in *strong* diluted nitric acid, thoroughly washed, wiped dry, and finished with "plate-cleaning liquid;" but that of Messrs. Forrest & Co., besides being excellent in quality, I find to possess the *great advantage* of freedom from extraneous impurities, and only to require well washing, drying, and finishing with "plate-cleaning liquid"—a mixture of *very fine* tripoli and spirit answers well for this purpose, a little to be poured on the centre of the plate, and rubbed with a pad made of chamois leather, until it "bites" equally on every part, and the surface has become quite dry; this need not occupy more than about half a minute, when on wiping off the dust, and applying the "breathing" test, the plate will be found beautifully clean.

The Bath.

This should be made with prepared nitrate of silver—*pure nitrate entirely deprived of free nitric acid*—thirty-five grains to the ounce of water, saturated with iodide of silver in the usual way, with one drop of glacial acetic acid (as the silver is generally slightly alkaline), added to every fifteen or twenty ounces; this strength to be kept up by the addition of prepared nitrate of silver from time to time, allowing about two grains for each stereoscopic sized plate sensitised.

Preparing the Plates.

Carefully remove dust from the surface of the glass, coat with collodion, and when *well set,* immerse it in the bath; allow it to remain a few seconds after all greasiness disappears; take it out and place on a levelling stand, or better still, on thick pieces of glass (smaller in breadth than the width of the plate), on a suspended shelf; allow it to remain for about half a minute,* but in summer from ten to fifteen seconds only.

Wash the Plates,

or more properly speaking, dilute the nitrate of silver on the surface as follows, viz., for a stereoscopic plate take four drachms of distilled water—a larger size will require a proportionate extra quantity—pour this *lightly* on at one corner, at the same time gently inclining the plate that it may flow *all over,* without the loss of any portion; reverse the motion that it may flow back again, and also from side to side, and continue until all greasiness disappears, taking care that it gets well up to the edges, *that the silver solution may be evenly diluted on every part;* this operation requiring, at this season, from half a minute to a minute according to temperature; in summer about fifteen seconds; then empty off the water, and place the plate as directed before washing it, but not on the same plate holder or piece of glass (fingers should be free from the bath solution when handling it); and

Coat with Prepared Albumen,

composed of white of fresh eggs and distilled water, of each ten ounces, strong liquor of ammonia eighty minims, agitate till the whole has become a perfect froth. *Filter through sponge always prior to use.* Pour on as much of this solution as will well coat the plate, at the same time giving sufficient inclination to make a little run over the opposite end, pass the remainder backwards and forwards that it may cover every part *well up to the edges,* then add a little distilled water, and pass this a few times from side to side, &c., empty it off, drain for a few seconds, and

Wash Thoroughly

as follows:—place it in a dish *larger* than the plate, containing distilled or filtered rain water, to cover it to the depth of a quarter or half an inch, agitate well for a few seconds, then leave it while a second plate is coated and placed in the bath. When this is done, again well agitate the dish till the plate is thoroughly washed; repeat with a second or even third quantity of water; if only a second is used, flush a portion well over it so as thoroughly to remove the excess of albumen. Hold it for a few seconds to drain (the hands must be quite free from albumen or silver). Place on one corner, on blotting paper *upon glass,* till "surface" dry, finally "film" dry, in any convenient manner at a temperature of 100° to 120° Fah.—the plate may for this purpose be *placed* for five or ten minutes on bricks that have been put into an oven till sufficiently hot. For keeping the plates uninjured, *tin boxes* are decidedly best, but next to tin, mahogany is least objectionable.

The Operating Room.

At this season of the year, when temperature is low and the atmosphere frequently surcharged with moisture, precautions are necessary with regard to it, not needed in summer when the reverse atmospheric condition is the case; and I am quite satisfied that many excellently-prepared plates have been spoiled for want of a knowledge of this fact. The temperature should not be under 54° Fah., from that to 60° is best; or not only is a portion of iodide liable to be deposited from the collodion, but all parts of the operation proceed much more slowly. The room should also be free from dust and *dry.* My recent experiments have given me indisputable evidence of the necessity of a dry room for the purpose of "surface" drying the prepared plates, they having shown that if the film be allowed to remain a long time moist *wavy marks appear on developing exactly similar to those occasioned by imperfect washing.* New wood of any description, more particularly *deal,* is to be *avoided* for either draining plates upon or resting them against: the injurious effect from this cause is easily shown, by dropping upon a moist prepared plate water that has stood for some time on a piece of deal—a nonsensitive patch will result wherever it has come in contact. *Glass is best for this purpose and unexceptionable;* damaged pieces laid upon an ordinary shelf, or a long strip, which can be obtained from any glazier for a few pence, answers well, providing they are sufficiently wide to prevent either water draining over the edge, or blotting paper coming in contact with wood. I have lately had my operating room arranged as follows:—For draining the plates upon I have made use of a glazed frame, with moveable cross bars of wood, framed with glass *rather wider* than the cross bar, and made to adhere by means of liquid glue, placed at convenient distances for leaning them against; underneath this is a metal box, four feet by eighteen inches and six inches deep, the bottom made of galvanized iron, the top of zinc, one end rests on a modified gas stove, to which a pipe is adapted for carrying heat along underneath the centre, and continued on into the chimney, by which all sulphurous or other fumes produced by the combustion of the gas are effectually got rid of: the other end is supported by two legs; on the upper part of this end, near the edge, a pipe is inserted for condensing surplus steam should it be formed, and near to it there is a small orifice that will admit of a funnel for supplying it with water, with which I keep it about half or three-fourths full, a cork being inserted in the orifice to prevent steam escaping.

When required the gas stove is lighted, and in about ten or fifteen minutes the room is at a good operating temperature, the

* Recommended by Mr. Glover in *The Photographic Journal,* March 1st.

diffused heat from the surface of the metal box or boiler quickly "surface dries" the plates placed on the glass just above it, they are then placed for a few minutes on the top of the boiler, which effectually "*film* dries" them; this method I find to answer exceedingly well. The heat is entirely under control, and can be regulated with exactness; it is at all times ready for use and free from dust.

The Exposure, Developing, and Fixing have been so frequently and fully described, and at present there is so little new to communicate, I feel it will be only unnecessarily lengthening an already lengthy communication to touch upon them.

In conclusion, I beg, in a friendly spirit, to make a few remarks upon Mr. Glover's "Hints on the Fothergill Process," published in your Journal, March 1st, which I read with much pleasure; they evidence no small amount of painstaking and much ingenuity.

The allowing a plate to remain on taking it out of the bath before applying the water I find to answer the purpose exceedingly well, but suggest that half the time mentioned will be sufficient in summer, or the film will most probably begin to dry and so offer a greater resistance than even when immediately taken out of the bath. The manner of applying albumen I also consider good and to possess advantages, *though not those mentioned* by Mr. Glover; for if silver solution be left sufficiently concentrated on any part of the plate to form a coagulum, *a film of albumino-nitrate of silver* will adhere *firmly* to the surface, on applying albumen *however quickly or in whatever quantity it may be made to flow over:* it is true a large portion of coagulum would float and carry off, but this, if allowed to remain, would not do further mischief; this being the case, it is evident it will not do to trust to anything but the *even* dilution beyond coagulation point of the silver solution for prevention of wavy markings arising from formation of this film.

The plan recommended for washing plates after the albumen has been applied is exceedingly ingenious, and I have no doubt will be found always thoroughly to answer the purpose, but I, nevertheless, still prefer my old plan of using a dish, which is much more simple and equally effectual. There is one point on which Mr. Glover is in error, which I beg to correct, viz., his supposing the theory to have been propounded that *much washing* of albumenised plates causes *loss* of sensitiveness; he will find in my pamphlet I direct the plate at this part of the process to be *well washed*, and in my communications I have laid great stress upon the necessity of attending to this in order *to prevent* loss of sensitiveness.

Though not entirely agreeing with all Mr. Glover's "Hints," I nevertheless consider them valuable, and, as he will perceive, have taken advantage of a portion in this communication.

ON COATING GLASS PLATES FOR COLLODION NEGATIVES OR POSITIVES, WITH A FILM OF ALBUMEN.

By Alexander M'Nab.

I have tried the preparation of plates (as recommended before the Manchester Photographic Society), with gelatine four grains to the ounce of distilled water, and the proper proportion of absolute alcohol. This preparation when completed is liquid and clear; the glasses, when coated and dried before a brisk fire, show little or no sign of anything having been applied to them.

At first I was so taken with this process, that I had serious thoughts of abandoning the albumen (which I had previously been in the habit of using) altogether, and substituting gelatine. After a few trials, however, I found that in *my* hands it was not to be compared with the albumen. The *first* plates developed clean, but soon began to exhibit symptoms of fogging, showing small pimples in the film, as if working with an alkaline bath. I found also that the plates after being prepared for two days, when put in use, parted with the collodion more readily than glasses cleaned in the usual way; this would be a serious drawback to its general adoption for the wet process.

It is far different with plates coated with albumen: these once properly prepared will keep for an indefinite period, the film *never* gives way, and there is no danger of being troubled with dirty glasses.

I do not use *patent plate* for either positive or negative pictures, that which is known as flatted-picture-sheet glass answering the purpose equally well. This suggestion was made to me by Mr. Church, and the experience of twelve months fully verifies its truth.

After numerous experiments, the following I have found to be the best way of proceeding.

Take four fresh laid eggs, beat up the *whites* to a froth, add sixteen ounces (by measure) of distilled water, a piece of camphor about the size of two peas, twenty drops of glacial acetic acid, filter when settled, and it is ready for use.

When the plates have been partially cleaned with a preparation of water saturated with common salt, and containing a portion of rotten stone, and wiped dry with clean *steam loom cotton cloth*, kept for the purpose (which I find better than linen diaper), take a large camel hair brush, mounted with tin, dip it in the albumen, and brush over the plate; this is done to allow the albumen to flow freely, which is now poured upon the plate (by this method the strength is always known). The superfluous solution is run back into a bottle through a filter; when drained sufficiently it is set on end upon blotting paper for a short time, and afterwards held before a brisk fire to dry. It is then ready for use for either negatives or positives by the wet process.

When thus prepared you will not be troubled with dirty plates, and they can even be redeveloped or whitened with bichloride of mercury, without fear of the film giving way. This is one of the severest tests which can be applied to a collodion plate.

The question may be asked, how long will they keep good after being thus prepared? I have heard it asserted indefinitely; some experiments may settle the question.

Mr. Young, of Helensburgh, having prepared a large number of plates for use at a future time, found that by keeping they became mouldy, and gave foggy results. From a series of experiments since instituted, there has been found a remedy for this evil. In order to test it fully, glasses cleaned the usual way were tried, first, to ascertain that the bath was in good working order; this point being established, a plate prepared more than twelve months was next tried, when the result proved corroborative of Mr. Young's assertion, viz., that it would fog. Being satisfied that this was the case, the plate was taken, and a solution poured upon it of—

Protosulphate of iron	1 ounce.
Distilled water	12 ounces.

(As suggested by Mr. Shadbolt).

This was done in order to coagulate the albumen; then after washing off the iron and drying the plate, the result proved most satisfactory, although the plate was mouldy previously to its being treated with the protosulphate of iron.

Here, then, from an experiment, the results of which have been uniformly the same, is seen the advantage of having always on hand a stock of prepared plates, upon the working qualites of which you can rely with positive certainty, besides the great saving, not only in material, but in time and labour, a boy being able to prepare a large number in a very short time.

The foregoing has been written in the hope that it will tend to remove some of the difficulties under which many of your readers labour, and should the practice prove as satisfactory to them as it has to the writer, he will feel a pleasure in having been of some service.

NEW SOLVENTS FOR COTTON AND SILK.

By Leon Krafft.

For some time past, it has been known to the scientific world that Dr. Schweitzer, of Zurich, had discovered new solvents for cotton and silk. This discovery has enabled us to elucidate several problems in vegetable physiology, hitherto very obscure, and it is hoped that photography may also derive some benefit from the new solvents.

According to Dr. Schweitzer, certain compounds of ammonia and copper possess the property of *instantly* dissolving cellulose, silk, and some other organic substances. The compound in which he first recognised this property, designated by the name of *oxide of cuprammonium*, is obtained by treating basic hyposulphate of copper with *liquor ammonia* in excess. A double hyposulphate of ammonia and copper is produced, which readily crystallises. The mother water, which consists partly of *oxide of cuprammonium*, is the new solvent of cellulose; but its preparation being very tedious, Dr. Schweitzer replaces it by a solution of green subsulphate of copper in excess of ammonia.

M. Peligot has simplified this process, and rendered it more economical. He fills a long glass tube with copper turnings, and pours upon them, in small portions, a given quantity of volatile alkali. Heat is evolved with the production of a blue liquor, formed, probably, of basic nitrate of copper, dissolved in excess of alkali.

When cotton is immersed in this liquid, it dissolves into a thick jelly, which disappears upon the addition of a certain quantity of water, with agitation. To obtain this liquid in a perfectly limpid state, it must be filtered through asbestos, for it immediately destroys paper filters, or rather, the paper is dissolved by this new reagent. The cellulose is precipitated by alcohol, by acids in

excess, by concentrated solutions of alkalies, by honey, gum, dextrine, &c. We can also obtain amorphous membraneous sheets, by simply evaporating the solvent, and these sheets are non-adherent to the surfaces upon which they are formed.

These remarks apply also to silk as well as to cotton, which has also another special solvent in the ammoniacal oxide of nickel. This reagent which is entirely without reaction upon cellulose, or cotton, does not separate from silk even upon the addition of concentrated alkaline solutions, sugar, or gum. Gun-cotton is insoluble in the two solvents above described. M. Fremy has discovered that ligneous fibres, and the sap of trees, are completely insoluble in the cuprammoniac reagent, and that this insolubility is not due to the great cohesion of the molecules of the wood, since it completely dissolves the albumen of *phytelephas*, or vegetable ivory, which is so hard that steel instruments cut it with difficulty. According to M. Payen, the textile fabrics of linen and hemp are soluble in this reagent.

M. Pelouze has also added his testimony to the value of these researches. He has discovered that concentrated hydrochloric acid is an excellent solvent of cellulose, the solution being effected in a few moments with the greatest facility. Water added to this solution forms a brilliant white precipitate, identical with that given by acids in the cuprammoniac solution of cellulose. He has also observed, that if, instead of adding water immediately to the acid liquor, we wait a couple of days, we then obtain no precipitate, the ligneous matter having entirely disappeared by being transformed into sugar (glucose).

Photography thus becomes possessed of several solvents of lignine, and soon of several collodions. These latter will have at least the advantage of dispensing with the costly solvents, ether and alcohol. The difficulty will be, how to prepare them, and experiment only will show. The probabilities of success lie in the following direction, among others :—

We may, for example, spread a layer of cuprammoniac solution of cotton upon a glass plate, and allow the ammonia to evaporate either wholly or in the greater part. Plunge the coated plate into water, acidulated with any acid, and wash it in water; then pour over it an aqueous or alcoholic solution of iodine, or of iodide of potassium. After a few seconds, immerse it in the ordinary nitrate bath, wash it in water, and then expose it in the camera as usual.

If these operations appear tedious, then we may take the solution of cotton in hydrochloric acid, and cover a glass plate with it; allow the acid, which is very volatile, to evaporate, and then immerse the plate in the nitrate of silver bath, after a previous rinsing in water. We shall then obtain a coating of chloride of silver, a very sensitive photographic agent. This method is extremely simple, only it imposes the necessity of preparing the collodion from day to day, because the hydrochloric acid converts the cotton into sugar in a very short time.

It would be easy to suggest other modes of preparing collodion with these new solvents. Those indicated above will serve to show photographers what they may expect from these new discoveries.—*La Lumière.*

RUSSIA AND THE ISLES OF THE OCEAN IN THE STEREOSCOPE.

By M. Ernest Lacan.

Certain persons of grave and dignified bearing, bald-headed and white-cravated, have often reproached me with over-estimating the advantages of photography, and of speaking with too much enthusiasm of its productions. Now, if I can only get one of these cold, calculating gentlemen into my study for an hour, I can, without entering into any discussion, take a little revenge out of him, which is very satisfactory to my pride. I have only to show him part of my stock of photographs collected during the past ten years, and which is daily increasing. At first my gentleman turns over hastily, with a studied and forced air of indifference, the marvels of art I show to him; but he gradually begins to thaw, and stops incontinently at the portrait of some great politician, or artist, or author, he admires, or at some striking landscape or architectural gem. Then he is in my power. Having found out his weak point, I assail him with pictures, I awaken all his sympathies, all his preferences, and all his reminiscences. I intoxicate him through his eyes; and it generally happens that his imagination, turned out of its accustomed routine, runs wilder than my own.

Then I wrap myself up in the mantle of my dignity, look severe, and in solemn measured voice, address him in this style :— " Ahem! You have accused me of extravagant enthusiasm, and here you are yourself excited with a few leaves taken from my portfolio. What will become of you when you read the whole book—when you are transported, as it were, by these works, from one quarter of the globe to the other?—when you visit the most famous ruins of antiquity; when you study leisurely the *chefs d'œuvre* contained in all the principal museums of Europe; when you traverse a street in Constantinople, a lagune at Venice, a canal at Amsterdam, or a square at Madrid or Moscow; when you sail upon the Rhine or the Nile; ascend the summit of Vesuvius or Mont Blanc, and witness the most important occurrences of our times, evoke its ruling spirits, and revive, amid the wreck of ages, the great recollections of the past? All this I can show you, and yet you accuse me of enthusiasm!"

This little speech, which, after all, is only the expression of truth, seldom receives a reply, and I generally make another convert to the charms of photography.

If I make this confession, it is just because I feel at this moment a fit of that enthusiasm for which I am so unreasonably reproached, the cause of which I will proceed to explain.

I have a great passion for travelling. I have already made a good many voyages, and photography will cause me to make many more. Thanks to the plan I have enounced above, I have visited nearly every quarter of the globe where objects of interest await the curiosity of man; but there are two regions which till now have remained closed to me—the extreme north and the extreme south. Now these are opened to us by photography, and we enter Russia with intelligent guides, and proceed full sail to Oceania. Is not this sufficient excuse for making rejoicing and raising a shout of triumph?

For a country, new as compared with other nations, Russia possesses a considerable number of edifices, judging by the proofs under our notice. Of these, churches form by far the greater portion. Nowhere have we ever seen so many; or, to speak more correctly, in this country almost every edifice resembles a church. At St. Petersburg they are generally in the style of our edifices of the seventeenth and eighteenth centuries: this is explained by the date of the foundation of this city, and by the influence of French taste upon the mind of the founder. Those of Moscow are of an entirely different character, such as are found nowhere else. They bear the true stamp of the national architecture.

The imperial palaces, as that of the Grand-duke Michael, at St. Petersburg, are, in appearance, the same as the royal residences of other countries. Formal colonnades, allegorical façades, massive railings, ample proportions, and grave aspect.

The Cathedral of St. Isaac resembles the Pantheon at Paris. The façade has every appearance of being copied from the celebrated composition of David d'Angers. The Museum, called also, I know not why, the Hermitage, is elegant in style and richly ornamented. The squares surrounding these edifices, the streets that lead to them, the river that flows at their feet, are all of immense proportions. Every thing wears an air of belonging to a nation of giants. Whenever a crowd gathers in this good city of Peter the Great, it must always find itself isolated. The thought makes me cold! I shiver while my eye traverses these vast open spaces. Yet I like to muse in the Peterhoff Gardens, beneath the great trees which surround the charming fountain of Alexander. The graceful colonnade surrounding this fountain reminds me of the little temples open to the sky which so frequently adorn the gardens of Italian villas; they want nothing but the sun of Naples.

I decidedly prefer Moscow, and putting aside all the marvels of the City of the Czars, I am tempted to make my entry into the old Muscovite capital. At once all is new, not in date, but in appearance. To enjoy a complete panorama of the city, I mount with the photographer to the summit of one of the minarets or clock towers. From the Kremlin the view is splendid. The gigantic and fanciful forms of the innumerable edifices look like an immense collection of Savoy cakes. It is superb. Viewed nearer, all these edifices present a character of originality which often attains to elegance and grandeur. Besides the Kremlin, itself quite a city, there are at Moscow only churches and convents. If the architecture of these sacred edifices be the expression of the religious sentiments of those who pray in them, or who bury themselves beneath the austerities of a monastic life, then surely nowhere can dissent be so numerous or so varied. Every fantastic form that stone can be chiselled into may be found here. Domes, minarets, clock towers, turrets, form a strange outline against the sky. Such a variety of columns, façades, and towers is here, that it looks like a collection of models of all the mosques, temples, and churches ever built. Such eclecticism! Still these edifices possess a vivid interest. The Convent of Sakolink has the aspect of an enchanted palace, the charming retreat of a fairy princess, an asylum against the temptations, vicissitudes, and annoyances of

the world. In a word, my impression is, that few collections have appeared to me so well calculated to command public attention as this. Our voyage to Oceania will be described on a future occasion.
—*La Lumière.*

Meetings of Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

10, *The Grove, March* 24, 1859.

MY DEAR SIR,

In compliance with your request, I subjoin, extracted from the minute book of our Society, the portion of Mr. Haes's letter which was entered at the suggestion of Mr. Glaisher, and enclose the minutes of our last meeting, held on the 21st instant, together with an abstract of Mr. Glaisher's lecture, delivered on that occasion.

Believe me to remain, my dear Sir,
Most truly yours,
THOMAS R. WHEELER.

Mr. Haes dates his letter, Sydney, December 11, 1858, and writes as follows to Mr. Melhuish :—

"MY DEAR SIR,—I am now able to communicate to you some results of the dry collodion plates which I obtained from you. The plates did *not* diminish in sensitiveness until I arrived at Ceylon, the date at which I wrote to you. I then traced a narrow band all round the plates, of about three-eighths of an inch, which I at first attributed to the partial admission of light into the plate holder; but having exposed plates under circumstances which totally precluded the possibility of light entering, I was led to conclude that the plates were losing their sensitiveness. Dr. Smith, of the Sydney University, has made some experiments upon some of the plates, and we have arrived at the conclusion, that the plates deteriorate *from* the edges; at present, not more than one-third is impressible by light; the change seems to commence at the edge of the plate from which the collodion has been drained. Should you think such information worth communicating to any of the Societies at home, please do so, because I cannot learn that any of these plates have travelled so far, and been kept so long."

AN ordinary meeting of this Society was held on the 21st ultimo, at Mr. Wheeler's, 10, The Grove, the President, J. GLAISHER, F.R.S., in the chair.

The minutes of the last meeting were read and confirmed.

The PRESIDENT presented the report of the Soiree Committee, announcing the kind acquiescence of the Lord Mayor, in reference to holding the soiree at the Mansion House; the 15th proximo being fixed as the date of the meeting, the invited members to assist in making the soiree "a great success."

It was moved and seconded, that the committee originally named be re-appointed, viz., the President, Treasurer, and Secretaries, *ex-officio*, Messrs. Bennock, Heisch, and Wood; Messrs. Stuart Knill, and H. Williams were appointed auditors for the ensuing year.

The President, Mr. GLAISHER, then proceeded to read a paper *On the application of Photography to Investigations in Terrestrial Magnetism and Meteorology, as practised at the Royal Observatory, Greenwich.*

The author commenced by saying that the subject resolved itself into two divisions, viz., the purposes to which photography is applied, and, secondly, the method of application; and he observed that it was necessary to consider somewhat in detail the first part of the question, that the full value of the application of photography should be understood, and that he purposed to confine himself on that occasion to the subject of investigation, reserving the consideration of the mode of application for another evening. The subjects of investigation were those elements in terrestrial magnetism and meteorology which it was considered most important at present to pursue. First speaking of magnetism, he said:—If a bar of iron be suspended by a few fibres of silk, by its centre, it will be horizontal, and will settle in any position; but if the bar be made magnetic, it will at once pass to a definite position, and one end will be inclined downwards. The direction of the magnetic force, he said, undergoes every possible change at the different parts of the earth's surface; and for the purpose of determining and representing the direction, is referred to two planes, the one horizontal, the other vertical. If a magnet be suspended horizontally by a few fibres of untwisted silk, it will rest in the magnetic meridian, and the angular distance between this position and the true meridian is called the variation or declination. The other plane of reference is a horizontal line, the angular distance between which and the inclined position of a magnet, when suspended freely, is called the "dip." In the practice of the observatory, the variations of the dip are made by investigations in the horizontal and vertical components; the variations of the three elements, viz., the declination, the horizontal force, and the vertical force of the dip, are the subjects of photographic application; and when it is considered that if the most minute spider should unfortunately gain access to the boxes containing the magnets, and attach one line of his web to the end of the magnet, that all freedom of motion is destroyed, it is evident that it can be but by some imponderable agent alone that such minute and delicate movements can be registered; and this service is satisfactorily performed by the means of photography.

The author then briefly referred to some application of such investigation; he said the mode of operation was as follows:—Taking the declination as an instance, that when any portion of the globe was sufficiently rich in results, they were laid down in proper positions on a map, and then, with a free hand and good judgment, isophænomenal lines were drawn. A map thus prepared by J. Evans, Esq., was exhibited, showing the lines of equal declination as far as is now known over the world.

A vote of thanks was then tendered to Mr. Glaisher, and a hope expressed that the subject would be resumed at some future meeting of the Society.

W. Nelson Smith, Esq., was elected a member; and the following gentlemen were proposed for future election, viz., Robert Obbard, David Harding, and Andrew Itter, Esqrs. The meeting then adjourned.

LIVERPOOL PHOTOGRAPHIC CLUB.

ON Tuesday evening, the 22nd ultimo, the fourth meeting of the above Club was held at Mr. Keith's Rooms, Lord Street Chambers.

There was a very numerous assemblage of the ordinary members, with several visitors, who took great interest in the proceedings.

After the usual preliminaries,

Mr. FORREST stated, that in pursuance of the requisition that had been made to him, to report upon the progress made by himself, and other members of the committee, appointed for the purpose of permanently burning photographs into the surface of glass, he had brought several specimens of his labour, which, though very far from attaining the excellence he sought, had revealed fresh arcana, that would involve much deep reflection, with renewed experiments and increased exertions. He had found that the fire, though it destroyed all traces of the film, yet impaired nothing of the delineation. The loss sustained by the heat was in the force and vigour only, that, as in the case of the negatives, first weakly developed by iron, to be afterwards intensified by pyrogallic acid —so the basis of the photograph was in the face of the glass; all that was needed was some reagent, to give force to the image, deteriorated as it was by heat; frequently they found their ordinary coloured glass required passing three times through the fire, to impart sufficient depth of colour to it. Acting upon this, he had sought to give greater boldness to the photograph, and had discovered that, in a well-developed positive, sufficient amount of silver was precipitated on the surface of the glass to serve as the nucleus for a farther deposit of a very thin coating of copper by means of the galvanic battery. The copper so thrown on the surface would be perceptible in the specimens now laid before the meeting; in the half of one, the mere photograph would be just traceable, in the form of a faint outline; whereas the other half of the stereoscopic picture that had been electrotyped, would be perceived to possess much of the black intensity of ordinary transparent positives. He might mention, that to remedy the great inconvenience of putting so small articles into a large kiln or furnace, he had found it suffice to place a sheet of iron on the fire, with the glass to be fluxed on the upper face of the iron; another sheet of iron was just supported above it, to keep it from actual contact, and, by heaping a moderate amount of fire over it, the fusing of the surface of the glass was speedily accomplished.

Mr. KEITH suggested that as the lines were to be rendered more intense from the oxide of copper, a readier way of imparting it to the silver on the glass would be to bleach the positive with the bichloride of mercury, and then to blacken, not merely with ammonia, but with ammonia-nitrate of copper.

Mr. GLOVER objected to this, inasmuch that though the blackening of the so-produced negative might be promoted by the chemical advised by Mr. Keith, yet he doubted if any appreciable amount of copper would be precipitated upon the silver.

Mr. COREY considered that at least the action of the mercury would greatly facilitate the deposits by the electrotype.

Mr. COOK exhibited what might be considered the perfection of photographic barrows, upon which much time and outlay had been expended. It was about five feet in height and four by two square.

On arriving at its destination, four legs, which admitted of raising it to any height, were let fall by releasing so many screws. The wheels were now removed. One side, on being let down, revealed the coloured window; the opposite side, when lifted up and supported, enabled the operator to sit under it, while enveloped with a drapery buttoned round him, thus excluding all daylight. The whole of the interior, forming a spacious operating room, was at his disposal. When closed, every needful article, such as chemicals, camera, folding legs, *et hoc genus omne*, were enclosed within.*

Mr. Corey said he considered it only fair to one of their members, to bear testimony to the superior excellence of his collodion. He held in his hand a negative which possessed every requisite that could be desired, and yet was the result of exposure of only two minutes in a very dull light, and developed with pyrogallic and citric acids only, without needing the addition of any more silver. He had tried many samples of collodion of admirable quality, but had found none equalling Mr. Berry's for sensibility, minuteness, and intensity.

The meeting separated at a late hour.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The usual meeting of this Society was held at the Chorlton Town Hall, on the 9th ultimo, the Vice-President in the chair.

At this meeting, in accordance with the rules, officers for the ensuing year were proposed and other arrangements made for the annual meeting, which will be held in April.

The President sent to the meeting a number of views, taken by Mr. Paul Pretsch's process, which were much admired.

Several gentlemen were proposed as members for election at the next meeting.

Mr. Rogerson then read the following paper on *The Enlargement of Photographic Pictures, either Positive or Negative*:—

The subject for our consideration this evening is the enlargement of photographic pictures, either positive or negative. My attention was first drawn to the subject by being called upon to make large negatives, at times when it was utterly impossible to do so, from the feebleness of the light; but, still, comparatively easy to make one of one-sixth or one-fourth size. Now, if we can increase the size of these small pictures successfully, it will be a great boon both to the amateur and professional:—to the amateur, by decreasing the bulk of his apparatus, for he may carry his camera in his pocket, with a few dry plates, his stand may become his walking-stick, and thus he may extend his rambles, looking for nature's choice subjects much farther than he would otherwise feel disposed to do.

The advantages to the *professional* portrait taker are such that I think can only be fully appreciated by him, for he does not require me to tell him that large pictures take considerably longer time for exposure than small ones, thus increasing the chance of failure; but this is not the worst:—portrait lenses, as you are aware, are made to take in a large angle, thus producing distortion, varying in amount with the size of the lens, the larger the lens the greater being the distortion. It is not unusual to hear parties say, who have had their portraits taken with a large lens, "Oh, it is much too stout for me; I am not near so fat as that." I do not bring *sitters* forward as witnesses at all times to be relied upon, for they make some strange assertions often; but in that they are quite correct, the picture is much stouter than the subject.

Now, as to the enlargement of pictures, I think you will see that there is no great difficulty. All of you will have seen photographic exhibitions with the lantern, and you know how correct we have an enlarged picture—how it strikes as a reality.

These pictures are *mostly* taken with small lenses, stopped down as well, thus lessening the angle and preserving the fidelity.

Now, you have only to imagine the sheet or screen to be a sensitive surface, and you then have an enlarging apparatus; and I do not yet see why we cannot at any time enlarge to the size of the original without producing distortion. There are persons who say we can't; and if there are any here to-night, I hope they will give their reasons.

The next thing I wish to mention, is the sort of light to be used; I think that artificial light will be the best, because we can keep it constant for a given time; those who have printed much with gas light know how easy it is—for the time, once ascertained, does for the whole lot that he may have on hand.

The apparatus now before you, consists of a small camera, with an ordinary quarter-plate lens, portrait combination, an expanding bag, to connect the lens with a large camera back, as large as is needed; and both ends contain the usual carriers. These are moved on a frame, containing two screws for focussing, by means of which the operator is enabled to alter either end of the camera for focussing as required; by the aid of the two screws, he can focus either for enlarging or diminishing, without moving his position; both are needed to bring the camera into focus, as you will see by examination, and with one screw, two persons would be required to arrange the apparatus. A small glass positive was fixed in the small end of the camera, and by the aid of a gas light, passed through a condenser, a magnified copy was plainly visible at the other end, in correct focus and proportions. A negative was then treated in the same way, the effect of which was very gratifying to the members, who regretted that there was so little time remaining to discuss the subject, owing to the time required by the routine business of the meeting.

Mr. Rogerson stated that a small positive could be placed in the camera, and a magnified picture taken with a good gas light in about five minutes' exposure on wet collodion, and that the lens then attached to the camera was one of the cheapest kind, only costing fifteen shillings, which he placed there purposely to show the effect by the most common appliances, and yet any person could see for themselves that the result was correct. He claimed no merit for any thing not known before, except that he thought the focussing arrangement was an improvement.

The thanks of the meeting were given to Mr. Rogerson for his paper, and to the Chairman, which concluded the business.

* This barrow was noticed in our leader of 1st December of last year.—Ed.

Letters to a Young Photographer.

No. VII.

My Dear Eusebius,

You are now about to greatly extend the sphere of your operations. That camera which you have been so wistfully eyeing and toying with for the last two months, is now to become your instrument of pleasure and toil—of success and disappointment; of as much care as besets the wearer of a crown—of as much delight as Pygmalion enjoyed upon completing his statue, which, to crown his happiness, he sought to animate. The charm of the life of an artist lies in his creative power; it is this faculty that enchants the budding photographer. He can create pictures, not by the slow and tedious ways of the painter, but by the magician's power which mocks at time and space. It is a pouring-on of charmed compounds, a touch of a spring, another pouring, and lo! there stands revealed a picture in all its charms of light, and shade, and detail!

You, who are so diligent a reader of this Journal, must have acquired some inkling of *processes*. There are plenty of them, so take your choice. Which shall you choose? Which do I think best? Probably they are all best; inasmuch as good pictures may be obtained by employing either one or the other of them. For in-door work, I, of course, employ wet collodion, pure and simple; while for out-of-door operations, I am the slave of *dry* collodion. I shall describe all the methods in their turn, but at present I shall discourse on other matters. As, at the outset of your career, you must inevitably waste a good quantity of materials, I must recommend you to work, for the present, your stereoscopic camera. With this you will be able to obtain a complete initiation into the *modus operandi* of the art, and your failures will not cause you so much regret as if you spoiled plates twelve by ten inches or thereabouts.

In commencing operations, you must proceed calmly and cautiously; avoid becoming excited, as most young photographers are apt to do; but proceed deliberately, and with a clear notion of what you seek to accomplish, and of the means also by which you expect to attain the desired result. Order and cleanliness are prime photographic virtues. There must be a place for everything, and everything must be kept in its place; and always keep the key of your operating room in your pocket when you lock it up; for if, by chance, officious, prying Betty should find her way in when your back is turned, she is sure, like every daughter of Eve, to taste forbidden fruit, and will most probably prefer a dose of cyanide, whereby a coroner's inquest will ensue, and you will be branded—"that murderous photographer!"

How lucky you are that you did not commence photography some ten years ago, when collodion was as yet undreamt of. Your choice would have been divided between daguerreotype and calotype. To the first of these I devoted my early affections most ardently; but it has gone the way of all things, and now lies buried

in the tomb of the Capulets, to be exhumed some day, probably, and clothed *in colours.* In calotype you would have had a choice between plain paper and waxed paper; but with collodion at your command, you would have looked scornfully upon all other vehicles or media. For a while you might have given yourself up to the dawning charms of albumen, still you would not have failed to become captive to collodion, sooner or later.

It will not be advisable for you to attempt making collodion or any other chemical in your present stage of initiation, it would only distract your mind from the main business, and digressions are not favourable to progress. I have before me a very excellent Treatise on Photography, which exhibits a singular talent for digression. The writer commences with telling you how to coat a plate with collodion: then he occupies several pages in describing the process of its manufacture; he arrives at the nitrate bath, then a dozen pages or more are occupied about silver, nitric acid, &c. Presently he introduces the camera, and then some thirty pages are occupied with a discourse upon light. He speaks of colours, and lo! a lengthy disquisition ensues upon a new theory of colour. Proceeding in this digressive style, it is with the utmost difficulty that the reader can contrive to dovetail the various pieces of instruction necessary to obtain a picture. So, in your practice, be careful to avoid digressions. Take a day previous to that upon which you intend to work your camera, and devote it to preparing your chemicals, so as to have every thing ready, and at hand, when operating. A little foresight and preparation will save you many untimely digressions, which are the sure precursors of failure and disappointment.

I hope your operating room is in good order, as I so frequently have impressed upon you; see that no light penetrates except through the yellow glass, and hang a heavy curtain over the door, *outside,* which will serve to exclude vagrant rays of light passing through keyhole or crevice. It is not a matter of utter indifference as to which part of the room you will appropriate to the various stages of a process. I prefer plenty of light, of the yellow sort, both for coating a plate, and for developing; but the places of these two operations had better be as wide apart as the space admits of. Your room must be effectually ventilated. I do not like a room with a chimney, because when no fire is kept, there is generally a downward current of air, loaded with sooty particles, which distribute themselves most provokingly where they are not wanted. If your room is sufficiently lighted through yellow glass, there will be no need of any kind of combustion, either from gas or taper, being carried on within it; and that I consider to be a very great advantage.

Water of course you have in abundance, "laid on;" but you must also provide a two-gallon bottle of distilled water, which, however, is best kept in a covered vessel with a tap to it. The waste pipe of your sink should be made to pass into a large cask or barrel, so as to recover the waste silver from the washings. Into this barrel you will put some *liver of sulphur,* in order to convert the salts of silver into *sulphides,* as I shall explain when I come to treat of *residues.* There ought to be another cask communicating with the first, containing also liver of sulphur, so as to make sure of precipitating all the silver. About six inches from the bottom, a tap must be inserted, to draw off the supernatent water; the sulphide of silver will be found precipitated at the bottom of the cask, in the form of a dense black powder. Every bottle should be labelled with the name of its contents; this is of the utmost importance, as most of the solutions employed are colourless; this is the case with solutions of nitrate of silver, cyanide of potassium, hyposulphite of soda, and pyrogallic acid; it will save you some trouble if these solutions are each kept in bottles of different sizes and shapes.

Keep your camera in a dry place, out of the dust, and before you proceed to use it, wipe out the inside carefully, and clean the lenses with a piece of chamois leather. You must place the camera "in position" before the object you intend to copy, because if you neglect doing this while operating with wet collodion, the plate will become spoiled during the time you are "fixing" the camera.

If you essay taking portraits, you will probably discover, after a great waste of time and materials, and no little patience, that in order to obtain a good picture, one in which the *chiar' oscuro* is artistically arranged, as much depends upon the manner in which you arrange the light to fall upon your object as upon all your manipulations. This is a point very much neglected among photographers; hence that mass of flat, insipid, or heavy blotty faces, we meet at every turn in exhibitions and on door-posts. Now it would be impossible for me to give you such directions by letter, as would enable you to surmount this difficulty, you will probably have to master it for yourself, since the "accidental lights," as the painters term them, will be governed by the aspect of your room. I may, however, say, as a general rule, that one side of the object must be more strongly illuminated than the other; that the amount of strong direct light upon the object need not be very great, but that there must be abundance of reflected light thrown on the object by surrounding screens.

Photographic Glossary.

Glycerine—A sweet syrupy liquid, colourless and inodorous, miscible in all proportions with water and alcohol, but nearly insoluble in ether. It is obtained from fatty matters, and is a waste product in the manufacture of stearine. It has been suggested as a preserving agent in the collodion process.

Glycyrrhizine—A sugar obtained from liquorice root. It is soluble in water and in alcohol. With most of the metallic salts it forms precipitates. It is added to collodion with the view of increasing the density of the blacks of negatives, and to developing agents with the same object.

Heliography—A Greek term, signifying *sun-drawing,* employed to comprehend all the various photographic processes, daguerreotype, talbotype, &c.

Hydrate—Water sometimes enters into chemical combination with bodies, the resulting compounds being termed *hydrates.* The chemical action is often very energetic, and much heat is evolved, as in slaking quick lime. After the water has combined with the lime, the slaked lime is a hydrate of lime. Oil of vitriol is a hydrate of sulphuric acid. In the formation of crystals, water enters into their composition, but in a less intimate manner than when hydrates are formed; the water of crystallisation may be expelled by heat.

Hydriodates—Combinations of hydriodic acid with bases, forming salts. They differ from iodides in containing water of crystallisation.

Hydriodic Acid Gas—A compound of equal volumes of hydrogen and iodine, which combine without decrease of volume. It is colourless and highly acid; it fumes in the air, and is very soluble in water. With the bases it forms hydriodates.

Hydrochloric Acid Gas—Called also "Muriatic Acid Gas." It is composed of chlorine and hydrogen. Water dissolves 480 times its bulk of this gas, and this solution forms the hydrochloric acid of commerce. When pure it is colourless. Mixed with nitric acid it forms *aqua regia,* the solvent for gold. It is occasionally employed in photography.

Hydrochlorates—Combinations of hydrochloric acid with the bases, which form salts. The principal one used in photography is the hydrochlorate of ammonia.

Honey—This well known substance is employed in photography as a preservative agent in the collodion process, to keep the film in that humid state considered essential for obtaining successful results. Honey appears to owe its photographic value to its hygroscopic qualities.

Hydrometer—An instrument employed for measuring the specific gravity of fluids, sometimes termed an areometer.

Foreign Correspondence.

Paris, March 24, 1859.

There is nothing new under the sun: not even photography. What is new is old, and what is old becomes new again. We have been pluming ourselves upon one of the wonderful discoveries of the present century, which we call *photography;* and just as we think we have capped the climax of perfection, up starts a ghost of the seventeenth century, who says, "That's mine! ye puny triflers, that—and much more, that ye vainly seek to discover." In a book recently published by M. Edward Fournier, entitled *Le vieux neuf,* the following remarkable passage occurs:—"At this period, an Utopian, one Thiphaigne de la Roche, discovered the daguerreotype, not the daguerreotype of the present day, but that of the future, in which the colours, as well as the images of objects, are reproduced—the daguerreotype perfected, such as it may become to-morrow, or such as it may not be for another century." The description of the process given by Thiphaigne is rather lengthy; but it is so curious and interesting, that I cannot resist the temptation to quote it entire.

"It is well known," he says, "that the rays of light reflected from different bodies form a picture, by depicting their images upon the surface of polished bodies — as, for example, upon the retina of the eye, upon the surface of water, glass, &c. Ingenious minds have essayed to fix these fleeting images: they have compounded a very subtle, viscous substance, which quickly dries and hardens, by means of which a picture is produced in the twinkling of an eye. They imbue a piece of linen with this substance, and expose it to the objects they wish to depict. The first effect on the linen is that of a mirror, in which may be perceived every object, distant or near, of which light forms the image.

"But what the glass fails to do, the linen, by means of its viscous coating, accomplishes. The mirror faithfully reflects objects, but retains none: our canvas reflects them no less faithfully, and retains them also. This impression of an image is the work of a moment, so soon as the linen receives it — it is then removed to a dark place; in about an hour, the sensitive coating becomes dried, and then there is a picture, more truthful and precious than any that art can produce. We obtain from the purest source, from light itself, the colours, which painters derive from different substances that time never fails to change. Accurate design, variety of expression, every touch, gradation of light and shade, the rules of perspective, we leave now to nature, who, with unvarying finger, traces upon our canvas the images perceived by the eye; and even leads us to doubt whether what we consider as realities are anything more than a species of phantoms, which cheat our vision, our hearing, and our touch — in a word, which cheat all our senses."

Burying the secret with him in the grave, we are half inclined to exclaim with the poet —

> "Call up him, who left half told
> The story of Cambuscan bold."

It would be different to describe photography in more correct terms than those employed by this Utopian, who dates from the year 1670.

There seems to exist just now, among photographers, a strong determination to perfect a method of positive printing, especially with regard to toning and fixing. M. Jobard, of Dijon, has communicated the following to the *Académie des Sciences*:—"When the proof is removed from the printing frame, immerse it in a neutral bath of hyposulphite of soda, of the strength of four ounces to one pint of water, and allow it to remain from fifteen to twenty minutes; wash and dry it; then immerse it in a bath composed of water thirteen ounces, bromide of potassium three drachms, and iodide of potassium two drachms; remove it, and hang up to dry."

Thus far the proof will not have altered in tone. The toning bath is composed of water thirty-five ounces, sel d'or fifteen grains. When immersed in this, the proof changes rapidly in tone, and passes from red to brown, violet, purple, and intense black. The toning may be stopped at any desired stage. Two proofs treated in this manner, exposed to the most noxious influences of light, heat, moisture, and foul exhalations, still remain intact, whilst others treated by the ordinary methods, exposed to similar influences, were destroyed.

M. Legray has been induced to modify his formula for toning and fixing positives, in consequence of many persons who tried it having failed of success. This failure M. Legray attributes to the great concentration of the bath, causing its action to be too rapid, and rendering it difficult to seize the proper moment for removing the proof from the bath. His formula, as modified, is as follows:—

Distilled water	3½ pints.
Chloride of lime	15 grains.
Chloride of gold	15 „
Chloride of sodium	15 „

The proof may be allowed to remain in this bath for half an hour, without detriment, and as the progress of toning is slow, the proofs can be removed when the exact degree is attained. It must be remarked, however, that as this bath contains but a very small proportion of gold, it will only serve for about twenty proofs of quarter sheet size; the bath must be renewed as required by the addition of fresh chloride of gold and chloride of lime, but it is better to make an entirely new bath when the old one is exhausted. The old baths may be treated with sulphate of iron to recover the gold remaining in them. Proofs thus treated are very pure in the whites, and quite permanent. The well-known bleaching action of chloride of lime removes any discoloration in the organic substance of the paper, while permanency is secured by no nitrate of silver being allowed to remain in the texture of the paper, as it is immediately converted into chloride upon immersion in the bath.

As the preservation of sensitive positive paper is now a subject of much interest, I may as well mention a suggestion made by M. Gaumé.

The sensitised paper is dried as quickly as possible before the fire, if the weather is damp, and enclosed in a box lined inside with a coating of plaster of Paris, perfectly dried in an oven or stove. The plaster may be in slabs, so as to be easily removed and dried from time to time, as they will absorb the moisture from the atmosphere. The sheets of sensitised paper should not be laid in a pile upon each other, but separated, so that the intervening air may always be dry. The plaster being very hygrometric, the air in the box will continue perfectly dry for a great length of time, provided the box is well closed. By this method M. Gaumé confirms the conclusions MM. Davanne and Girard have arrived at, namely, that the discoloration of sensitised positive paper is due to the action of moisture and the presence in the atmosphere of deleterious gases. M. Gaumé has also submitted some modifications of his process, published in August last, for taking positive proofs on paper prepared with a solution of gutta percha in benzine, which he now applies to negatives. These are prepared exactly as the positives, with this exception, that he adds to the albumen, instead of chloride of sodium, two to three per cent. of iodide of ammonium and one of bromide, and dries the paper before the fire. After exposure the negatives are developed with gallic acid, to which some drops of aceto-nitrate of silver are added.

The proofs are fixed with hyposulphite of soda, ten ounces to a pint of water.

The paper is sensitised by immersing it in ordinary aceto-nitrate of silver, and afterwards washed in two or three waters, and dried at the fire.

If there be any signs of resinification after this operation, the proof is immersed for a few minutes in benzine, which removes the greater part of the gutta percha. If the proof is very strong, wax it as usual; if it be weak, leave it semi-transparent.

MM. Davanne and Girard have published, in continuation of their report on positive printing, their conclusions as to exposure in the printing-frame, or, as it is termed, *insolation.* One point at which they have arrived possesses strong interest at the present moment, when the question of "bottled light" is under discussion. In repeating the experiments indicated by M. Nièpce de St. Victor, they never succeeded in producing the effect of solarisation described by that gentleman; for whenever they took a sheet of paper, sized or unsized, and exposed it to light in the printing-frame, and then floated it on the nitrate of silver bath, no appreciable result could be discovered; consequently, they cannot, even after the most careful experiments, confirm M. Nièpce's views as to the absorption or storing up of light by paper. These gentlemen delicately remark, that possibly they operated under unfavourable conditions: "perhaps the light was not sufficiently intense," &c.; but they confidently assert that the exposure of paper to light, previous to sensitising, exercised no influence upon the production of the positive proof.

J. P.

Correspondence.

COATING PLATES BEFORE COLLODIONIZING.

To the Editor.

Sir,—With reference to a subject which has lately been discussed between us, viz., the possibility of producing from the fibre of different grasses, &c., a form of pyroxyline suitable for the dry process, I may mention that the experiments have now been discontinued, since it appeared certain that the film so made, although sufficiently porous and adhesive, was wanting in sensitiveness to the darker parts of the object, and tended to exaggerate the contrast between the extreme tints. Hence, although answering well enough for printing transparencies, it failed in producing a perfect camera picture.

A very important advantage would be gained if the same collodion could be employed both for the wet and dry processes, and this desideratum seems likely to be realised. The formula for pyroxyline, which I have lately submitted to a committee appointed by the Photographic Society, has the merit of being very adherent to the plate, and good dry pictures have been taken with collodion so prepared. The use of gelatine as a preliminary coating to the glass, recommended by Mr. Dorrington, attaches the film still more firmly, but probably a better substance for that purpose is caoutchouc dissolved in benzole.

I find that I am not the first to suggest a varnish of the above kind. Mr. Barnes, in the second edition of his "Dry Collodion Process," has mentioned India rubber with other similar substances. In his preface he complains that his just claims have been overlooked, but if so, it has been done unintentionally. Possibly his suggestions are somewhat to

numerous to be easily intelligible, but many of them are exceedingly practical, and the work is one which ought to be consulted by all who turn their attention to this branch of the art. Mr. Barnes's views on the use of an ordinary sensitive collodion for the dry process, and the employment of a subjacent layer to retain it upon the glass, appear likely to be carried out extensively, and very excellent negatives have already been taken in that way.

If any of your readers are interested in the matter, and can make it convenient to attend the next meeting of the Photographic Society, on the evening of April 5th, I purpose, in the absence of more pressing business, to exhibit two or three plates which have been sent to me, and to make a few remarks with the hope of originating a discussion.—Yours, &c. F. HARDWICH.

King's College, March 24th.

PRINTING GLASS TRANSPARENCIES.

To the Editor.

Sir,—Do you know if the simple process of printing glass positives, by coating the glass with albumen, and then proceeding in the usual way as with paper positives, has ever been tried? I dont see why it should not succeed, and save a vast deal of bother of working by a dry process.

The idea has just been hinted to me, and may prove useful to our photographic brethren.—I am, yours, &c. J. S. MOON.

Islington, March 8, 1859.

[Would not your proposed method be a "dry process?" We do not see in what way it would be more simple than any now in use. You would find the film of albumen alone a very troublesome affair to get even and free from specks of dust. You must also remember, that the exposure required would be much longer if no developement were adopted; while the certainty of operation would not be any greater, as you could not, as with paper, bend up a part to see how the printing progresses. Possibly, however, some of our readers may see their way to utilize the hint, although we do not. Another objection would be, in there not being any ready way of pouring free nitrate of silver.—Ed.]

QUICK PROCESSES.

To the Editor.

Sir,—I take the liberty of sending you a paragraph from a newspaper, and I should feel greatly obliged if you will state by what means you think the pictures referred to are done.

I observe in your last number a note on Messrs. W. & D. Downey's pictures, taken at the opening of the Jarrow Docks. It would be very interesting to know something about the process, and the lens they employed in its production.

Many of the stereoscopic slides by Mr. Wilson, of Aberdeen, must be taken by some very quick process. It would be a boon to photographers, if such gentlemen as Messrs. Kibble, Wilson, and Downey, would publish their processes, and state what lenses they use.—Yours, &c.

Glasgow, March 17, 1859. J. R. A.

[The individual referred to in the newspaper paragraph which you enclosed, is not a producer of micro-photographs, only a seller of them. We were the originators of them, and you will find full particulars of the process for their preparation in the *Liverpool and Manchester Photographic Journal* for 15th November, 1857, No. 22, in which a paper read by us, at the Photographic Society, appears.

We trust that your hint will obtain the information you desire from the gentlemen named.—Ed.]

PRESERVATIVE CASES FOR SENSITISED PAPER.

To the Editor.

Sir,—Among things which I did not get speaking of when I had the pleasure of meeting you here, were cases for preserving sensitive paper, of which I had then two in hand. They both, amusingly enough, consist of japanned tin cylinders, with internal cylinders of perforated zinc, to contain chloride of calcium, and on which to roll the paper.

One of the two which I had made has a valve in the centre of the brass screwed cap, through which the air may be abstracted by an air pump, for the further security of the paper. The other case is furnished with two valves at the same end, to afford facilities for replacing the atmospheric air in the case with carbonic acid gas.

The carbonic acid is easily produced, and conveyed by a flexible tube, and is blown through one valve (the other being also open), until the atmospheric air has been displaced by the denser carbonic acid.

I have not time at present to say more, than that I may be able to-morrow to send a photograph of one of my cases, which in form seem so nearly to correspond with the description in your Journal of the 15th, the reading of which at this moment has induced me to write to you.

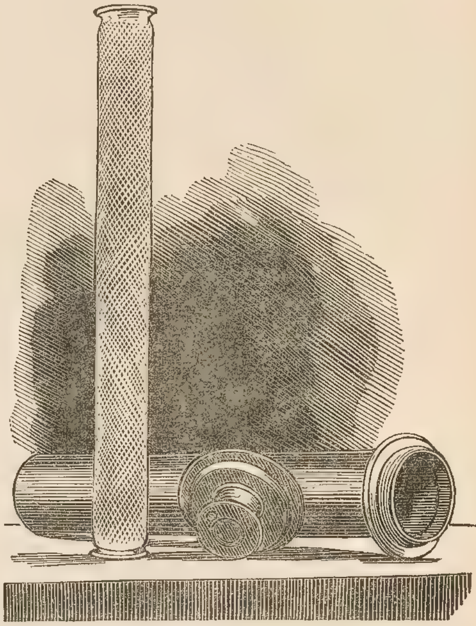
Yours, &c.

March 15, 1859. WM. CHURCH, Jun.

Sir,—I now send a hurried photograph of one of my preservative cases referred to in my note of yesterday. It scarcely calls for explanation. The screw of the cover works down on a washer of leather (india-rubber does not seem to answer with a screw), smeared with lard, or what I think is better, india-rubber, melted on a metal plate by means of heat. The zinc cylinder has a removable cap at each end to admit the chloride of calcium, or to replace it when it has become damp. When in use, the zinc cylinder is covered with porous paper, properly secured to prevent particles of the chloride from getting in contact with the sensitive paper. The removal of atmospheric air, or replacing it by carbonic acid, have not yet been sufficiently tried, to admit of my saying that either will be of additional advantage.

I hope such a thing as this has not been patented, and regret that I did not sooner give you the means of publishing it.—Yours, &c.

March 16, 1859. WM. CHURCH, Jun.



OPTICAL ARRANGEMENTS, &c.

To the Editor.

Sir,—1. Will you, with your usual kindness, please to inform me in your next Journal the best method of removing the small round discs from microscopic glass, in order to save the glass, a quantity of microscopic objects having been badly mounted and spoiled from a variety of causes.

2. Will you, at the same time, inform me what you consider the best method of rendering very fine old collodion sensitive as possible, without destroying its fine quality, for small locket portraiture, with the quantity to be done at once, proportions, ingredients, &c.

3. In trying to concentrate the rays of light from a lamp upon a bull's-eye lens, three inches diameter and five inch focus from the flat surface, and those again upon a double convex lens, eight inches in diameter and sixteen inch focus, what should be the relative distances to give the best and most concentrated light upon a negative portrait, in order to take a transmitted positive by artificial light—that is, the distance of the lamp from the bull's-eye, the bull's-eye from the large lens, and the large lens from the portrait, say three inches square?

You will greatly oblige if you can give me a reply to these three queries in your next, as I much wish to try some experiments of the kind referred to in your last, and time is just now an object with your constant subscriber. VERITAS.

London, March 21, 1859.

[1. If mounted with Canada balsam, put the slides into a wide-mouthed bottle, and cover them with camphene, benzole, or turpentine, fit in the stopper or bung, and let them soak; the thin glasses will then readily come off. If the covers have been cemented on with gold size, soaking in a strong solution of soda will do—liquid glue (shell-lac), or asphalte, will yield to the former solvents.

2. Your question is rather obscure. If you wish to *restore* old sensitised collodion, we know no better plan than that formerly suggested by Mr. Crookes, viz., immersing in it a slip of silver foil, until discoloration ensues—but if you mean to sensitise plain collodion for positives, take alcohol (S.G., 816) one ounce, iodide of cadmium eight grains, iodide of ammonium six grains, bromide of ammonium four grains. Add one part of the preceding to three parts of plain collodion. This is Mr. Hardwich's formula. The quantity prepared at once must depend upon your consumption; it is very sensitive when freshly mixed, and keeps fairly for about a month, with but little loss of quickness.

3. Place the bull's-eye very near to the lamp—so near that the rays *slightly diverge* after passing through it (this would be about four inches distant in your case); place the other lens as near as possible to the bull's-eye, but so that the *cone of light* just fills the *entire area* of the larger lens (probably about six or eight inches off from the bull's-eye); the rays should proceed nearly parallel, or only slightly converging from the large lens, and the negative may be within a couple of inches of it.

Your bull's-eye is of too long a focus—one of two and a-half inches diameter and three inch focus would be better; of course, placed closer (say within two inches) to the lamp. The purer the light the better, quality being more important than quantity in this case.—Ed.]

ON COVERING MICRO-PHOTOGRAPHS.

To the Editor.

Sir,—I am rather surprised at the difficulty experienced by your correspondent "Veritas" in this matter, and think it must arise entirely from his mixing his balsam with turpentine. I have always been in the practice of allowing a drop of balsam to simmer, *not boil*, on the photograph resting for a minute or two on the warm mounting table, and then of dropping on it the thin glass cover, previously warmed, forcing out the superfluous balsam by slight pressure.

You will see the effect in the two specimens enclosed, which I forward, for the additional reason that they have been made without any previous practice in the art of photography, by carefully following out the directions contained in your interesting paper, read before The Photographic Society, 5th November, 1857.—I am, yours, &c.

Aberdeen, March 21, 1859. H. A. S.

[The specimens received evince the skill of the operator, but are rather heavy in the shadows; we would recommend to him a trial of the iron developer, given in our present leader, as likely to produce less violent contrasts of light and shade, with the collodion he employs. We are obliged for his reply to "Veritas,"—we are are always pleased to find correspondents assisting one another.—Ed.]

PRACTICAL DETAILS RELATING TO NEGATIVES AND PRINTING.

To the Editor.

Sir,—Would you kindly tell me in your valuable Journal (1) in what proportions should I use citric acid instead of acetic acid; this would be useful to many to know, as citric acid is so much cheaper and in a more convenient form than acetic acid. 2. What is the best strength for a salting solution, both for pure albumen, albumen half diluted with water, and for plain paper, using with all the papers a sixty-grain exciting solution. 3. When using an iron developer for negatives (collodion) is the pyrogallic acid used immediately after the iron solution is washed off, or after the fixing: in such case is anything gained by employing the proto-acetate instead of the proto-sulphate of iron? 4. Your opinion of the paper marked "La Rive," and where it can be obtained.

After troubling you so much, allow me to thank you most heartily for the extremely kind way you have sacrificed your time to the troubles of numerous dull-headed photographic brethren, including

Yours, &c. BRUIN.

[1. Generally, about *one grain* of citric acid will be required where *thirty minims* of glacial acetic acid would otherwise be used—this is, however, not an absolute proportion under all circumstances—when used with pyrogallic, in cool weather, one grain of citric acid to two of pyrogallic, in one ounce of water, is sufficient—in warm weather, equal proportions—but in *hot* weather, the citric acid is invaluable, and then two grains may be employed to one of pyrogallic acid. For *moist* plates the addition of a little alcohol is a requisite, in order to cause the solution to flow easily over the plate; but for dry plates alcohol is not only needless, but detrimental.

2. It would be rather rash to assert that any particular strength of salting solution is *the best*, but we recommend the following for use with a sixty-grain to the ounce sensitising bath, viz.—

	Pure albumen.	½ alb. & ½ water, or water + gelatine 2 grs. to each ounce.
Chloride of ammonium......	10 grains	—15 grains.
,, sodium............	12 ,,	— 18 ,,
,, barium............	20 ,,	— 30 ,,

The above will give nearly the same quantity of chloride of silver whichever salt is employed.

3. See our Leader. If all the details are *well out* with the iron developer, it is best to fix *before* using the organic developer; but if the half-tones are rather weak from under exposure, and *provided there are no symptoms of fogging*, then the pyrogallic acid may be employed advantageously after washing off the iron, but *before* removing the iodide of silver.

4. Personally, we consider the paper you name *too tender*, but many operators like it. You can purchase it from most dealers—for instance, Horne & Thornthwaite, Hockin, Knight, Spencer, Sanford, &c., &c., all keep it.

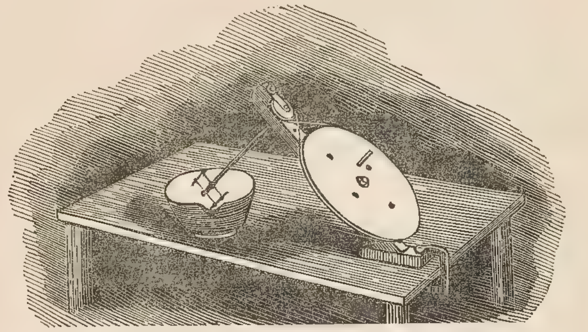
Our object is to be of service to our readers; but, apart from this, we feel a *pleasure* in so doing, especially towards brother photographers.—Ed.]

APPARATUS FOR FROTHING ALBUMEN.

To the Editor.

Sir,—In mechanically preparing albumen for photography the thorough and complete disintegration of every particle is indispensable.

By the ordinary fork process this is generally a long and tiresome job. I long contemplated making a machine to assist in the work, and have recently constructed a rough one, which answers completely, taking six minutes only to beat the albumen up instead of twenty-five, and producing a much better article, so much so that I think it would be impossible to make it as well by the fork.



The apparatus is simple: a suitably shaped beater is rotated amongst the albumen in a basin (slowly at first, the speed being increased as the froth rises), by means of a pair of pulleys, in the proportion of about six to one, connected by a crossed band; a speed of upwards of five hundred revolutions per minute being easily attained. The standard, carrying the pulleys and beater shaft, slants at an angle of about forty-five degrees, and may be fastened to a table or board by a clamp.

When in use the large pulley is turned by the right hand, the basin containing the albumen, &c., being held in the left, so that the beater can have the proper dip, and every bit of the froth subjected to it effectually.

The enclosed print will show you the arrangement.

21st March, 1859. M. NOTON.

NEGATIVE COLLODION FOR COPYING AND LANDSCAPE PHOTOGRAPHY.

To the Editor.

Sir,—You will greatly oblige me by giving in your next Journal a formula for the best negative collodion chiefly to be used for copying and landscape photographing. It should be rather *quicker* than the ordinary collodion purchased in shops, have fair keeping qualities, and give a very dense negative, developed with protosulphate of iron, and strengthened with pyrogallic, &c.

What do you think of an iodizer containing a well-balanced quantity of several iodides and bromides? I have used a collodion said to be so iodized, it gives a splendid negative, is very quick, and keeps well, but the person to whom the formula belongs has an objection to open his heart and memorandum book to his brother photographers.

If you would also state where I may obtain the ingredients, you may be kind enough to recommend, you will further oblige.—Yours, &c.

Manchester, March 10, 1859. IN-QUEST.

P.S.—I have read Hardwich thoroughly upon the point, but cannot come to a satisfactory conclusion as to *the best*.

Where shall I find a good account of your honey process? I wish to try my hand at the "*sticky mess*." I have read the letter in Vol. VI. No. 88, but I cannot gather sufficient for my purpose.

[We have not yet learned that *the best* negative collodion has been realised; certainly we are not presumptuous enough to lay claim to a knowledge of its formation. The fact is that our correspondent asks for somewhat of an anomaly, in requiring one to be equally good for "copying" and for "landscape photography," and to be unusually "quick," and yet stable; moreover, he does not specify whether he means for a dry or a humid process.

For copying, we prefer an old and somewhat glutinous collodion, that is rather slow, and produces dense pictures.

For landscape purposes by the Fothergill process, we find a rather *thin* collodion, not contractile, but made with a powdery kind of pyroxyline, answers best, while for the moist process we prefer it rather thick, *not* too highly iodized, *not* old, nor yet too fresh.

As a rule, we object to the use of iodides and bromides of many different bases, the simpler a formula can be rendered the better. For certain purposes there may be exceptions to this rule. We have a good opinion of the suggestions thrown out by Mr. Heisch, relative to the use of bromides and iodides in something approximating to atomic

proportion, and recommend you to read his paper in our last volume, pages 136 to 138.

For a good general collodion that keeps well, we give a recipe, but bear in mind that we cannot have the *best* for *all* purposes in one article.

Make your pyroxyline from the *best cotton wool* with nitrate of potash and sulphuric acid, as directed by Mr. Hardwich, wash well, and to the last water used for the purpose *add a little liquid ammonia*, just enough to give a scent to it. Test your ether for acidity, and if acid reject it. Then take—

Pure washed ether .... 4 drachms.
Pyroxyline.. 8 grains.

Immerse and shake well, allow to stand a short time, then add—

Alcohol (strength 95 per cent.) .... 4 drachms.

Again shake up, when the pyroxyline ought to dissolve.

It is better to make at least half a pound of collodion at a time, though if your consumption is large, a Winchester quart is not too much, and place it in a tall bottle; allow it to rest perfectly untouched for a day or two to let any undissolved particles of cotton subside, then pour off carefully all but the lower portion that remains thick.

The iodizing solution may be made as follows:—

Alcohol, as before.. 4 drachms.
Ether, as before.. 4 „
Iodide of cadmium ....16 grains.
Bromide of cadmium .... 6 „

Add one part of the above to three of plain collodion.

With regard to the honey process, we have been working, and are still continuing some experiments, which promise considerable advantages in manipulation, &c., for we find that for certain purposes it is far the pleasantest mode of operating in our opinion. We expect to be able to publish the results shortly.—Ed.]

DISORDERED NITRATE BATH.

To the Editor.

Sir,—According to your advice, when my silver negative bath became acid, and gave me indifferent and foggy pictures, I added some oxide of silver, and exhibited it to the direct rays of the sun: at first it reddened, and afterwards turned black, without making any precipitate. As this bath is almost new, having been prepared, with nitrate of silver at five shillings per ounce, not longer than three weeks, may I seek your advice in asking if I may decolorise it by adding some kaolin.—Yours, &c.

C. C. D.

[There must be some mistake in your diagnosis, as the medical men would say. Acid baths give weak but not usually *foggy* pictures. Again, darkening in the sunshine without deposit indicates rather *organic* impurity. Try the addition of a few drops of citric acid in solution so long as any precipitate is thrown down, let it settle, and pour off clear, filtering the remainder, then add a few drops of carbonate of soda solution to remove the acidity, and your baths ought to work properly.—Ed.]

IRON PRINTING.

To the Editor.

Sir,—Having tried Mr. Hannaford's iron process twice, and failed both times, I am at a loss how to proceed, in order to obtain a good picture. Will you kindly try to help me out of the difficulty through the medium of your valuable Journal?

I noticed Professor Archer's remark on manganese in your last, and tried paper prepared with boracic acid, sulphide of ammonium, and sulphate of manganese (an original thought), but without effect. Do you think permanganate of potassa will do?

Thanking you for your last, I am, yours, &c.

Liverpool, March 14, 1859. A YOUNG BEGINNER.

[Although we have seen some of Mr. Hannaford's proofs that give indications of *promise*, as also some of Mr. Burnett's and Mr. M'Craw's, none are to us quite satisfactory as yet. The contrast of light and shade is too marked, all the more delicate gradations being either absent, or else the deep shadows are grey instead of black. The chief difficulty appears to be in keeping the lights clean; salts of iron once *in* the paper are very difficult to remove. We think the use of an English paper, well sized with gelatine, and then albumenised, the best to operate upon. Harrison's paper is of this character, and fairly smooth. Be careful not to *over* expose your proofs. We have not much hope of any good result with manganese as a photographic agent in any form.—Ed.]

CARBON PRINTING—FAULTY TONING.

To the Editor.

Sir,—As your correspondent from Swansea wishes to know if any one has got a prize in "the Pouncy lottery," I wish to inform him that not only myself, but many others, have succeeded in obtaining proofs quite equal, and in many cases superior, to those exhibited by Mr. Pouncy, through the information he gave to his subscribers.

Now, in reference to the "*blanks*" sometimes obtained in all lotteries, I think (in fact, I am quite certain) that a great number, if *not all*, obtained *blanks* who sent the *fee* for a recipe for a "toning bath," advertised some few months ago in the Photographic Journals, as superseding all others, for quality of tone, purity of the whites, and above all, economy. I for one got "a blank," as did many others with whom I am acquainted; therefore, I do not think your correspondent is justified in drawing attention to his so-called Pouncy lottery in the "blank" manner he does, seeing that there are other lotteries containing *nothing but blanks*.

In conclusion, I will state that I mixed seven "toning baths" for myself in succession, after trying each one thoroughly, but not a single passable print have I obtained—nay, the whites were even dirtier than "old hypo" is accustomed to give, and not occasioned through any mismanagement on my part in the preparation of the baths, for I have now practised photography in all its branches for the last six years, and have succeeded with every process but the said toning bath.

Perhaps some one will be kind enough to inform the unfortunate subscribers how it is they get such miserable "blank" results,

And oblige, yours truly,

Liverpool, March 22, 1859. MANY BLANKS.

ANSWERS TO CORRESPONDENTS.

Thames Darrell.—See answer to In-quest.

Peter, Tyro, M. T.—See reply to A Young Beginner. No fixing agent but water necessary.

James Southwell, B. M.—We will give you the information desired upon the working qualities of the orthographic lenses in an early number.

Caustic.—No! Take the 10 × 8. You may say who sent you. We leave the selection to him.

R. Dart, Churston-Ferrers.—The term "xylographic artist" could not be properly applied to a photographer, it indicates rather a wood engraver, or one who draws upon wood for the engraver.

X. Peterborough.—See preceding reply. We do not mind stating facts upon such a point, but cannot recommend any particular maker. If you cannot judge for yourself, get some experienced friend to help you.

J. R.—Your explanation is not clear. How much iodide of potassium did you add? Are you sure that your bath was acid before adding carbonate of soda? And lastly, what quantity of nitric acid did you subsequently employ? You may have over-dosed it with one or all of these ingredients, and if you have too much of the last, as we suspect is the case, of course it will not act. See answer to C. C. D.

Thomas Smith, Barmecide, Old Hypo, C. B., F. J. K., and Simon.—You will find answers to all your queries in the numbers of the *present volume*. We have no objection to reply in detail at any time, and always disregard the trouble it may be to us personally to assist our subscribers in their photographic dilemmas; but if we were perpetually repeating such simple matters, we should be open to complaints from the generality of our readers. Surely you cannot have read the last few numbers as well as purchased them.

J. Roberts.—We have tried the formula given by Mr. Maxwell Lyte, and found it, as we expected to do, exceedingly good. You must be careful to have your chloride of gold *neutral*, and in order to do so you will require to add solution of carbonate of soda until all effervescence ceases, and litmus paper is not rendered red when immersed in the solution. When neutral, add sufficient water to make up such quantity as a total that will make the solution contain eight grains of chloride to the ounce, each drachm by measure then would contain one grain. The proofs should be well freed from *nitrate of silver* before immersion in the toning bath, and if one hour does not do, give two or ten if need be, being careful, however, to protect it from *strong light*.

J. McM.—If you have but one dark frame for plates, nine by seven inches, you will find the following plan for changing them in the field answer well:—The plate-box in which they are carried must have a provision for excluding light at the lid junction. Take two thicknesses of yellow calico (or better still, yellow tammy) and make a bag of the whole width of the stuff, with a mouth capacious enough to go on the end of the camera. The mouth is to be furnished with a piece of elastic band to keep it close. At the lower *angles* of the bag make two openings, large enough to admit the hands, and furnish them also with elastic bands to close round the wrists; lastly, insert about the centre of one of the sides of the bag two pieces of yellow glass (like spectacle eyes), and sew a piece of elastic across in such a manner that if passed over the back of the head, it will keep the glasses in contact with the eyes so as to look through. To operate, put the plate-box into the camera with the lid towards you, and the glasses with the collodion side upwards (to prevent rubbing off the film at the edges in drawing them out), the dark frame in the bag, which latter is then to be slipped over the open end of the camera. Look through the glasses, put the hands through their opening, and the manipulation is very easy—the elastic round the head keeping the bag extended.

Received: Letter from our New York Correspondent (which shall appear in next publication)—and "An Old Subscriber." Had the latter complied with the request to forward letters on *editorial* matters to the address indicated below, instead of to Liverpool, an answer to his query would have been in time for this number.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 92, Vol. VI.—APRIL 15, 1859.

It was with much pleasure that we recently made the personal acquaintance of M. Voigtlander, the celebrated optician, of Vienna, whose name is well known to most photographers in connection with the construction of photographic lenses in general, and orthoscopic ones in particular. In the course of conversation with this gentleman, we were informed by him that *every lens* which leaves his establishment is not only carefully examined by himself, but that he personally invariably gives the last finishing strokes to them all, as he graphically expressed it, "with his own ten fingers." This it must be admitted is the best guarantee for an approximation to uniformity of excellence.

We were invited to attend at M. Claudet's gallery in Regent Street, to assist at a comparison that was made between lenses the production of MM. Voigtlander and Dietzler respectively (the last-named being the optician at present working under the guidance of Professor Petzval), but important business engagements prevented the possibility of our being present. A contemporary has however published a statement of the facts and conclusions arrived at, which agrees in all particulars with what was related to us by a gentleman present at the recorded examition, as well as with Mr. Kater's account, which will be found in the report of the London meeting.

We do not express any opinion upon the respective merits of the lenses compared, not only because we have never personally compared them one against the other, although we have examined *each* kind *separately*, but because also we contend that the mode of investigation adopted was not a proper test of the capabilities of various *photographic* combinations of lenses—the visible images only having been criticised without any proofs having been actually taken. Now we assert most positively that we have found lenses giving brilliant visual images and yet very indifferent photographic ones; whilst others have produced pictures decidedly better than their visual images would lead an observer primarily to expect. We admit that a lens producing the best photographic impression will generally be found to produce also a good visual one, but the converse of this proposition by no means holds good.

We are informed that the mode of testing adopted was that insisted on as most satisfactory by Professor Petzval himself; we do not however so understand that gentleman's assertion, but merely believe him to declare that, in examining photographic lenses when made by a special formula, it is not necessary to take a picture with each one of them to become satisfied of its adaptability to the purpose intended, and to this proposition we yield assent; but if it be contended that an optical examination of *any* lens is sufficient to decide its photographic qualities, we must, notwithstanding an authority so weighty on the other side, express our emphatic dissent.

There is another point upon which we have a word of objection to record; it is this, that in noticing the amount of *curvature of field*, especially in a landscape lens, the image as seen by the eye is by no means a criterion to be relied on. Of this fact we are strongly convinced by practical experience, and knowing it to be as we state, we seek for an explanation of the phenomenon, which we take to be as follows:—In a landscape lens, owing to the diaphragm being placed at a distance from the glass, different portions of the lens are employed to produce the centre and edges of the picture; now if the visual and actinic foci are made to co-incide for centrical axial pencils of light, they ought not exactly to agree for lateral oblique pencils, for near the circumference of the lens the crown glass is thinnest and the flint glass (that possessing most dispersive power) is thickest, hence the effect produced is what opticians call over-correction, consequently the tendency is to throw the chemical focus further from the lens in *that part of the subject* than the visual one, hence that which at first appears to be a defect becomes available as a positive advantage.

We do not, then, undervalue an examination of the visual image in its way, but do contend, that for photographic purposes that is only a part, not to say a small part, of the work required to be done to arrive at a just conclusion.

We have been favoured by Messrs. Murray and Heath, of Piccadilly, with a copy of the likenesses of the Imperial Commissioners Kweiliang and Hwashana, who signed the recent treaty entered into between our own Sovereign and the Chinese Emperor. They are in their native costume, of course, which to an European eye presents any thing but a graceful appearance, and while the first-named is in a constrained attitude, with decidedly angular outlines, the other seems more at ease. They are seated, one on each side of a table adorned (?) with drapery, having figures peculiar to the Chinese upon it, and on the table are two glass jars, the jars, instead of the heads, being crowned with the conical mandarin hats "with the little round button at the top."

As an interesting historical record, the photograph will no doubt be valued. It was taken on the 1st July, 1858, at Tien-tsin by Mr. Robert Morrison, attaché to H. B. M. Mission in China. Unfortunately, the negative became injured during the voyage to this country, hence it was necessary to call in the aid of an artist to render it a presentable picture, but the characteristic features of the Commissioners are preserved.

While in conversation the other evening with Mr. P. W. Fry, one of our oldest and ablest photographers, and who was amongst the first, if not the first amateur experimentalist with collodion, that gentleman mentioned the fact, that for very many years he had been in the habit of employing a partially air-tight box for the preservation of sensitised sheets of chloride paper. The kind of box used by him, was one of those cylindrical red leather boxes, made for carrying writing materials, the cover sliding on and fitting very closely, so closely, that on opening the box, a tolerably loud report is made from the compression of the air.

It is somewhat singular as well as satisfactory, that a proceeding, found to be practically effective so many years ago, should now be recommended upon purely theoretical grounds; and if M. Gaumé's arrangement of inserting super-dried tablets of plaster of paris should be found by experience to be successful, it would appear that a very simple piece of apparatus, adapted to the wants of amateurs, may be readily acquired, by casting a

plaster cylinder in a mould made by a ruler, drying it in the oven, and wrapping sensitive paper around it previously to inserting it in such a box as we have been describing. This would probably preserve the paper for from a week to ten days, with little or no trouble, and would therefore be sufficient for most occasions.

We have much pleasure in noticing that many of those employing albumen in the dry collodion processes as a substratum for the film, are calling to mind the fact that to Mr. Barnes is due the credit of having originally suggested its use in this way; and though several others have independently arrived at a similar conclusion as to its advantage, it is a fact which in no way detracts from the value of their observations, while at the same time it is a kind of tribute to Mr. Barnes's acuteness.

We regret to find that Mr. Moon, the able honorary secretary of the North London Photographic Association, has been obliged, from the state of his health, to resign his post to Mr. Barnett. The committee, as will be seen in another column, accorded an expression of their appreciation of his services. We trust that the compliment also paid to ourself may be as well merited.

We are much gratified in being able to announce the formation of a Photographic Society at Leicester, a fact upon which we heartily congratulate the inhabitants of the district, as we know of few pursuits more conducive to the amusement and instruction, not only of its immediate votaries but also of those connected with them. Photographic Societies, when properly conducted, not only form centres of union for those engaged in kindred pursuits, but also tend materially to promote agreeable social gatherings, at which many delightful and lasting friendships are frequently formed, events which would not in all probability otherwise have occurred.

In the foreign correspondence will be found a communication from our United States informant, which almost makes us think that the designation *United* is somewhat Hibernian, and were the letter not written by an American, we should have come to the conclusion that the writer was misinformed upon some of the matters of which he treats.

To those who are still investigating the practicability of the substitution of iron for silver printing, we commend an attentive perusal of some remarks made by Mr. Johnstone, at the last meeting of the Birmingham Photographic Society, which will be found at p. 97, and trust that they will carry out the suggestions there thrown out.

SILVER PRINTING PROCESSES,

Including Salting, Sensitising, Toning, Fixing, and Testing Baths.

By C. J. Burnett.

A.

SALTING BATHS.

Proportions of Salts for an 8–10 *ounce Bath.*

No. 1.

80 grains chloride of ammonium.
30 „ bromide of potassium.*

Paper so salted may be sensitised with plain nitrate bath, but is rather intended for ammonio-nitrate, and *more especially* for the modifications of baths (to be presently described), consisting of ammonio-nitrate with the addition of citric, benzoic, or other acids, sensitised with which it gives admirable results.

No. 2.

70 grains chloride of ammonium.
25 „ bromide of potassium.
40 „ benzoate of soda.

This paper prints very rapidly, and gives good tone when sensitised with plain *neutral* nitrate of silver bath, but may also be sensitised, if wished, with the other baths. (Try it with No. 10.)

* Bromide of cadmium or of ammonium may be substituted in equivalent proportions here and elsewhere, and may sometimes have the advantage over it.

Nos. 3, 4, 5, 6, 7.

Same as 2, but with (3) citrate, (4) tartrate, (5) oxalate, (6) *succinate*,* in something like the equivalent proportions, or (7) formiate, instead of the benzoate of soda.

With citrate of soda or tartrate of ammonia† we get good tone, but with rather inferior sensitiveness to No. 2; however, the paper keeps better after sensitising than that salted with No. 2.

No. 8.

90 grains chloride of ammonium.
50 „ benzoate of soda.

A good and rapid paper, when sensitised by plain nitrate of silver bath, has the advantage over paper salted with mixtures containing bromides of being fixable by ammonia, which the latter are not.

Nos. 9, 10, 11, 12, 13, 14, 15, 16, 17.

Same as 8, but with a (9) citrate, (10) tartrate, (11) oxalate, (12) racemate, (13) succinate, (14) fumarate, (15) formiate, (16) meconate,‡ or (17) carbonate, substituted for the benzoate. With the exception of No. 16, they are also all suited for use with ammonio-nitrate baths and ammonia fixing.

N.B.—These same mixtures of salts may be also all used in the preparation of albumenised paper (either in the proportions named, or with a larger proportion of the *citrate* or other vegetable salt), and with very great improvement in the tone generally given by albumenised papers.

B.

SENSITISING BATHS.

No. 1.

Citric-ammonio-nitrate bath being a common ammonio-nitrate bath (say 60–70 grains to the ounce) as ordinarily prepared, with the addition of citric acid, either as citrate of ammonia; or else in the pure form, in a saturated solution, to as great an extent as can be done without producing a permanently insoluble precipitate,§ shaking well.

No. 2.

Benzoic-ammonio-nitrate bath. Same as No. 1, but with the substitution of benzoic acid or benzoate for citric acid or a citrate. Benzoic acid being sparingly soluble in *cold* water, must be introduced, either as a solution in *hot* water or in the dry, flaky crystals in which it is sold. I have got a capital bath by adding them in pretty considerable quantity, and after shaking them up well and leaving them in the liquid for a day or two, then filtering the bath from what of them remained undissolved; but a less quantity added will also give a very good bath, *e.g.*, we may saturate one-half of the ammonio-nitrate bath and then mix it with the rest. I am not sure that the papers prepared by this bath keep quite so well as those by bath 1; however, they seem still more sensitive. I find a bath neutralised partly with citric, partly with benzoic acid, give capital prints.

Nos. 3, 4, 5, 6, 7, 8, 9.

Same as Nos. 1 or 2, but with (3) succinic, (4) malic, (5) tartaric, (6) oxalic, (7) formic, (8) carbonic,‖ (9) acetic acid, or one of their salts, instead of the additions in 1 or 2.

The sensitising baths now described, especially as prepared by the addition of the free *citric*, benzoic, tartaric, succinic, or other acid, have great advantage over the ordinary ammonio-nitrate baths, whether used with chloro-bromide paper (formula 1) or with the ordinary chloride-salted papers (Marion, Canson, Rive, Pirie, Saxe, or others), with both of which they give most admirable results, both as to tone and as to rapidity of printing, as well as *what is most important of all*, the adequate representation of all the delicacies and half-tones of the negative printed from. With these baths I have also been in the habit of floating both the chloro-bromide and the chloride papers, without finding any tendency to deterioration of the bath, or at all events any which cannot be remedied by the occasional addition of a little more nitrate of silver, and it may be, a little more citric or other acid.

(To be continued.)

* The idea of the succinate we owe, in the first instance, to Mr. Hunt's "energiatype" process.

† Tartrate of ammonia is what I used in my experiments in 1854-5, and is easily made, but common Rochelle salts will also answer.

‡ The meconate must be pure and made from acid which has not been browned by alkali in its preparation, and is best used in an acid bath, or in preparation of paper to be used for an acidulated sensitising bath, or acidulated sensitising solution to be applied with "Buckle's brush." N.B.—Gallic and pyrogallic acids should also have a fair trial here instead of the meconates.

§ Or saturate one-half with citric acid and then mix with the rest, in the same way as Mr. Hardwich recommends, in his new edition, with nitric acid.

‖ By passing carbonic acid gas through the solution in a deep bottle from a bent tube connected with another bottle containing chalk and muriatic acid.

ON MICRO-PHOTOGRAPHY.

By Joseph Sidebotham.

[Read at the Meeting of the Manchester Photographic Society, April 6, 1859.]

Several paragraphs having lately appeared in the public papers, with reference to the production of micro-photographs, one or two persons having claimed, as a new discovery, what has been known and practised a long time; I think it merely an act of justice to my friend, Mr. Dancer, to place on record what share he has had in originating these beautiful productions.

Mr. Dancer, if not actually the first, was *one of the first* who took a daguerreotype picture in this country, before any specimens taken by Daguerre himself had been brought over: as early as the year 1839 he paid some attention to the production of minute photographs on silver plates, reducing a bill of twenty inches in length to one-eighth of an inch, by means of an achromatic combination of one-and-a-half inch focus. At the suggestion of a friend, he then used for the purpose the eyes of recently killed animals, and produced with them some minute photographic pictures; these being electrotyped, and several copies taken from each, produced the letters and images of the pictures in their proper position.

In July, 1840, Mr. Dancer publicly exhibited, during a lecture at the Liverpool Mechanics' Institution, the mode of taking photographs of microscopic objects, a flea being magnified by the gas microscope to a size of six inches, and a photographic image of it taken on a silver plate during the progress of the lecture. He also took photographs of sections of wood and fossils, both on paper and on plates, by means of the solar microscope. I may just mention that about this time Mr. Dancer tried experiments with the solar spectrum, and obtained on paper evidences of colour both in the red and yellow rays.

Owing to the nature of the deposit forming the photographic image on silver plates, micro-photographs could not be viewed with a higher power than about twenty diameters, consequently Mr. Dancer laid the matter aside, until Archer's discovery of the collodion process, which at once suggested itself to him as applicable to the production of minute photographs.

I have in my possession two micro-photographs, given to me by Mr. Dancer early in 1853; they are about one-sixteenth of an inch in diameter. One is a copy of the monumental tablet erected to the memory of Sturgeon, the electrician; the other a group of portraits of Mr. Dancer's own family. Since that time Mr. Dancer has paid considerable attention to the subject, and produced much more minute and perfect specimens, copies from pictures and photographs from nature in great variety, and has supplied them to the principal opticians here and on the continent, and there are few interested in such matters who do not possess some of them. The Queen is in possession of a set of portraits of members of the royal family and other subjects, the production of our respected townsman.

As an instance of the extreme minuteness of some of these photographs, I may mention that Sir David Brewster calculated, from a specimen sent to him by Mr. Dancer, that an encyclopœdia of twenty volumes could, if reduced to the same dimensions, be easily carried about in a purse.

I have made the foregoing remarks in order to claim for my friend, Mr. Dancer, some of the credit due to him for his labours in this direction. Having had the pleasure of his intimate acquaintance for nearly twenty years, I am in a position to speak with confidence. Mr. Dancer's modesty will not allow him to speak of his own discoveries, but I am sure you all join in the annoyance I have felt in seeing persons coolly claim as their *own new discoveries* what our respected townsman has accomplished so many years ago.

ON PRINTING GLASS TRANSPARENCIES.

By T. H. Nevill and James Dorrington.

[Read at the Meeting of the Manchester Photographic Society, by Mr. Dorrington.]

This paper, which is contributed by Mr. T. H. Nevill and myself jointly, has no pretensions to being either scientific or chemical; it is intended simply to record the results of a series of experiments made with a view to overcome the various difficulties attendant on the processes by which glass transparencies had previously been printed, and which had been found so tedious, and in the hands of the amateur so frequently uncertain.

The members present who had the opportunity of seeing the various transparencies contributed by gentlemen connected with our Society, and exhibited with the magic lantern, by Mr. Dancer, at our monthly meeting, on the 1st of December last, will recollect how many of them, beautiful as they were in subject, and mostly printed evidently from very good negatives, were defective as pictures, from want of cleanliness and of brilliancy. They were the results of many processes, such as collodio-albumen, Fothergill's, honey, and dry collodion; many of them were also furnished, as they had been manipulated by the most successful of our members, as they doubtless consisted of some of the best pictures which each could bring. But it was very evident, that much was at that time needed, even as respects the obtaining of good pictures at all, to say nothing of the tedious length of time which some of the processes necessitated, whether we regard the first preparation of the plates, or the subsequent developement, and of the numerous failures, after all the care and pains bestowed upon them which the pictures exhibited, evidently indicated, even more than they actually expressed.

It was with a view to obtain some more simple and certain process than any in use that the experiments now about to be detailed were undertaken, and which have at length resulted so satisfactorily in that process which I had the pleasure of communicating to this Society, at its monthly meeting in February last; a process which all the experience which Mr. Nevill and I have had with it subsequently (and we have printed with it, probably, at least two hundred transparencies, with nearly uniform success), has established as particularly suitable for attaining the object we had in view.

Amongst the transparencies exhibited by Mr. Dancer, with the magic lantern, at the meeting of the 1st of December last, were a few which I had printed according to the formula of the Rev. Mr. Sisson, communicated through the columns of *The Times*, on the preceding 18th of November, called the "Raspberry Syrup Process." I had, however, used raspberry vinegar, which, successful at first, I still find superior to the syrup recommended. This, "another new process," was on its first announcement subjected to a perfect storm of ridicule, headed by the grave and sober editors of photographic journals and almanacs, and taken up with fun and frolic by other contributors, down to Job Trotter's merry friend, "J. M.," the famous discoverer of the celebrated "gin and water process," who, as gathered from his very clear letter, made no such pretensions to that absolute sobriety of body or mind, which doubtless always characterises the editorial body, when, *ex cathedra*, they fulminate their infallible decisions. With due reverence to them, and equally due respect to their august dicta, I felt, unfortunately, that I could not accept their judgment upon a process which evidently they had judged before trial, and which in my hands was yielding excellent results, say brilliancy, depth of shadows, and unfailing cleanliness.

Defects and Proposed Remedies.

But there was one drawback to it, and that a very serious one, viz., that the films were very loose, and consequently very difficult to retain on the plate. To overcome this, Mr. Nevill suggested the use of a little albumen round the edges of the plate. By this means the film was readily enough kept on, but it remained doubtful whether the amount of washing which the printed transparencies would bear after fixing, and which washing required to be manipulated with great delicacy, was sufficient to ensure its permanency. The experiments thus far carried on, were detailed by me at our meeting on the 1st December last, and led to a general conversation on the subject, when several suggestions were made, none of which, however, struck us as superior to the plan we had adopted of albumenising the edges of the plates.

Mr. Nevill, however, was not satisfied with the process on account of this serious drawback, considering that a film so loose as to be in danger of washing off the plate would necessarily be open to objection, and he commenced an extensive series of experiments, having as their object to replace the raspberry syrup with some other preservative, which would afford equally effective results, but free from the objectionable looseness of film. Amongst the various substances which he employed in these experiments were isinglass, serum of milk, sugar of milk, grape sugar, and gum: these he dissolved in water, and with spirits of wine, in various combinations. He also tried spirits of wine alone as a preservative. The general result was, that whilst many of these substances gave very fair results in respect to the pictures produced, they were mostly as loose in the film, and not equal in brilliancy or in intensity, as those obtained by means of the raspberry syrup. The only process which in his hands rendered the film perfectly adherent was one tried with serum of milk, which had been prepared with treacle, much in fact in the style of a treacle posset. The collodion film thus covered would bear any amount of washing, but the surface of the plate was so greasy as to render an even developement next to impossible.

After this point, Mr. Nevill's experiments took a new direction, in consequence of his reading a paper by Mr. George Nevile, which appeared in the *Journal of the Photographic Society*, of the 21st Dec.

ast, in which it was suggested to cover the plate with a thin film of albumen prior to applying the collodion. This suggestion was entirely new to Mr. Nevill, who, whilst carrying on his subsequent experiments, believed it to be original. It was, however, only the following out of a very old suggestion, as subsequently has turned out to be the case —for, so far back as the year 1854, the same plan was suggested by the Rev. William Law, rector of Marston, in a letter published on the 21st Oct., 1854, in the same Journal. And again, a similar recommendation is to be found in Mr. T. Barnes's small work on the "Dry Collodion Process," published in 1856.

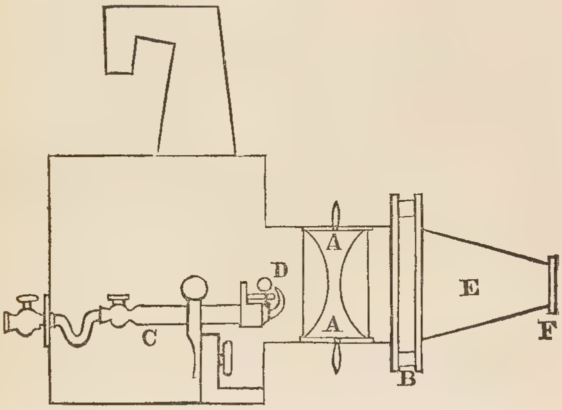
(To be continued.)

DESCRIPTION OF A LANTERN FOR MAGNIFYING PHOTOGRAPHIC TRANSPARENT POSITIVES, FOR THE ILLUSTRATION OF LECTURES, &c.

By W. Hislop.

[Read at the Meeting of the North London Photographic Association, March 30, 1859.

The lantern is of wood and of the usual form.



The condensers are two plano-convex lenses, each of four inches in diameter and six inches focus. These are set in a cell (A), with their convex surfaces towards each other: this cell is capable of being slid to and from the light or object, for the purpose of adjusting the illumination.

B is the aperture for the admission of the slide, and in front of this is a cone (E), at the end of which (F) is screwed a quarter or one-sixth portrait combination.

The lime light is preferred for illumination. The arrangement consists of a Flemming's safety jet (C), placed longitudinally, so that it can be moved to and fro. On the barrel of the jet is a clip, having a stud attached to it, on which a ball of lime is placed, and adjusted so as to receive the stream of gas from the jet D. A stopcock is screwed to the outside of the lantern (which I prefer to be of wood), and is connected inside with the jet by means of a piece of india-rubber tubing. The gas used is composed of equal volumes of coal gas and oxygen, and the light produced is exceedingly brilliant.

I find that the use of the portrait lens as a magnifier gives such excellent results in definition, and freedom from colour, as to render it possible to use the ordinary gas-microscope objects, which are thus shown with far more distinctness than the low magnifying power used would lead us to expect.

With ordinary slides, or for coarse pictures, a common argand oil lamp may be employed with excellent effect.

The diagrams exhibited consisted of the moon and other astronomical subjects, Arachnidæ, vegetable cuticles and their appendages, from microscopy, horological subjects, maps, and some few views.

The adaptability of the arrangement for the larger class of microscopic objects, such as sections, algæ, trachæ of caterpillars, and whole insects, was also shown.

NOTICE OF RECENTLY PUBLISHED STEREOGRAPHS.

Amongst the most pleasing of our editorial duties we may reckon that of awarding commendation which has been faithfully earned. There is, perhaps, no branch of photographic industry which is so extensively pursued as the production of stereographs — a remark that holds good, not only as regards the negatives, but also in respect to the number of positive proofs printed therefrom.

Wherever our wanderings may be directed — in shops devoted to all sorts of manufactures, as, for instance, in those of opticians, stationers, chemists, fancy warehousemen, dealers in china and glass, toys, &c.—we find displayed in the windows stereoscopes and the accompanying slides.

Where quantity is in such profusion, quality is too often lost sight of; and though the effect of apparent solidity is of itself sufficient to charm the novice in stereoscopic matters, without reference to the nature of the subject delineated, such is not the case after the surprise of novelty has worn off.

There are, however, but few persons who have made much use of the stereoscope who would be willing to forego the possession of the instrument, if provided with slides of an interesting character; and no matter how many they may possess, they are constantly adding to their stock, not because they weary of those they have, but because the inspection of a well-executed subject in the stereoscope is but little short of an actual visit to the place itself, and thus with every addition the pleasure of a new experience is acquired.

We have just received from Mr. W. Woodward, of Chapel Bar, Nottingham, a series of admirably-executed stereographs, chiefly of architectural and rural subjects, that are deserving of the highest commendation, and as photographs possess very considerable merit, not on account of their execution, but also as regards artistic excellence. Some of the subjects we have seen before, and had occasion to notice favourably when awarding the prizes given by the Nottingham Photographic Society.

We have, on the occasion just quoted, already remarked upon the slide of *Peterborough Cathedral*, which is taken from the north-east corner of the Minster Yard, and gives an excellent notion of the building. We recommend Mr. Woodward to take another view of the same Cathedral from the Market Place, a position which commands the beautiful west front, and, if executed with his usual skill, we can venture to promise him a tolerably extensive sale of his proofs.

Two slides of *Woollaton Hall*, the residence of Lord Middleton, are also valuable illustrations of architectural subjects; that with the tree in the foreground being particularly interesting to all lovers of the picturesque, though architects will probably prefer the other view of the building, designed by the celebrated John of Padua, on account of the details being none of them intercepted by intervening objects.

Newstead Abbey, *The Menai Bridge*, and *Conway Castle*, are also interesting productions of a similar class. The first-named, we fancy, would have been more picturesque if taken from a position a little further to the right hand than that chosen, but we notice that it would then have required a later hour in the day to have rendered the shadows as effective. In the *Menai Bridge* view, the wooded scenery on the opposite side of the water is distinct, yet properly subdued; there is detail without undue obtrusiveness, a quality, we were dogmatically informed by an artist a few years back, that a photograph *never* could possess.

Of the *View in Wilford* (No. 24), the prize picture, we have already given detailed particulars in Vol. VI. No. 86, page 24; there are, however, three others from the same village, which possess nearly an equal degree of merit. These are charming bits of English rural scenery, that are truly samples of our homely landscape beauties, consisting of thatched cottages, half buried in foliage, the pleasant shade under which forms a refreshing contrast to the flood of sunlight bathing the rest of the subject. In one, a wreath of half-transparent smoke curls gracefully against a background formed by masses of leaves; in another, a fine old walnut tree completely overwhelms a little cottage under its protection; in a third, a horse-chestnut tree shelters a truly rustic home. The slides to which we allude are numbered respectively 4, 7, and 29.

The Bridge in Burghley Park is, perhaps, one of the best-executed and happily-selected in the collection. The beautiful transparency of the tranquil water, bearing on its surface the floating leaves of the water-lily, the reed-bordered bank of the stream, the bridge half screened by the shrubs, and wholly reflected in the crystal stream, produce altogether a composition as delightful as it is placid.

We cannot conclude without the mention of one more amongst Mr. Woodward's collection — that of a *Valley in North Wales*, near Llanrwyst, that is pleasingly illustrative of mountainous scenery.

By a careful examination of the pictures we have been describing, we have come to the conclusion, that Mr. Woodward operates with one lens, and exposes his plates necessarily at two separate consecutive spaces of time. Now, as a matter of economy in apparatus, this is all very well, and for taking positives on glass for stereoscopic subjects, it is decidedly the best plan, as the two

impressions can be taken in the correct relative position without transposition—a necessity that would involve, in this case, the cutting in two of the slide; but where *negatives* are the desiderata, this position is not of any consequence, because the paper proofs can be transposed, and the advantage of taking the two pictures simultaneously is not to be lightly disregarded. Not only is a portion of the effect sacrificed by a slight shifting of the shadows when the impressions are received consecutively, but it frequently happens that owing to a variation in the light, one picture gets more done than the other, although perhaps equally exposed, and in some cases the loss of the sharp shadows in one, and not in the other, is the inevitable consequence of a troublesome cloud intervening between the times of the two exposures. We think, therefore, that so skilful an operator as Mr. Woodward has proved himself to be, does not do himself justice in employing a single lens camera, for, however great an adept a photographer may be, he does not act wisely in neglecting any advantage whatever, of which he might avail himself if he would. If Mr. Woodward will adopt the use of a bi-lens camera, he will, we doubt not, earn fresher laurels —but in offering this suggestion, we would have it understood that it is not from any noticeable deficiency in his productions that we make it: rather because he works so well that we would fain relieve him of unnecessary difficulty.

We may remark, for the encouragement of those employing dry processes, that Mr. Woodward's pictures, abounding in detail, brilliancy, and half-tone in perfection, are all taken by the collodio-albumen process.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary general meeting of the above Society was held on Tuesday, the 5th instant; Professor Vignoles in the chair.

The minutes of the last meeting were read and confirmed, and several gentlemen were duly elected members of the Society.

Messrs. Burfield & Rouch exhibited a new folding camera, of ingenious construction; also a modification of their dark operating chamber, by which it was converted into a roomy and commodious dark tent for working large collodion plates in the open air.

Mr. Sutton, of Jersey, exhibited a model of a boat built for photographic purposes, and the Secretary read a description of it. The two ends of the vessel were made alike, that is, with bows at either end, the length being about forty feet. The bottom of the boat was flat, and furnished with a false keel, to give stability, but which could be readily unshipped to adapt the vessel for shallow water. The timbers were merely uprights attached to the bottom, thus avoiding the use of curved timbers, by which the cost of construction would be materially less than would otherwise be the case. A small cabin and three masts were provided, and the estimated cost of the whole amounted to but £50.

The Chairman said, that speaking from his own experience, having been in many parts of the world, he considered that travelling by boat was a very pleasant mode of conveyance, to say nothing of the convenience of carrying photographic apparatus in that way.

The Secretary then read the names of those gentlemen who had been appointed by the council a sub-committee to examine and report upon Mr. Hardwich's collodion, as requested by that gentleman at the previous meeting of the Society. The committee was to consist of Messrs. Fenton, White, Mayall, Williams, Llewellyn, De la Motte, Bedford, Rosling, Frith, Hughes, Morgan, and Robinson.

Mr. Malone suggested the addition to the collodion committee of Mr. Storey Maskelyne, who was one of the first to draw attention to the probable importance of the addition of bromides with iodides; of Mr. Hughes, of Middlesex Hospital, who has devoted great attention to matters of the kind; and of Mr. Spiller, whose labours in connection with this subject were well known; and there would then be three chemists upon the committee.

Mr. Hardwich, so far as he was concerned, assented to the addition, stating his belief that the addition would give satisfaction, and that in proportion to the number of names upon the committee.

The Chairman stated that, inasmuch as it was for the advantage of the Society and for the art of photography, there should be as much light of science thrown upon the subject as possible: if the three gentlemen named did not object their names would no doubt be added by the council; and this would have been the case, without the subject having been brought before the meeting, if Mr. Malone had been good enough to have communicated with the council upon the subject.

Mr. Le Neve Foster objected that the meeting was proceeding irregularly. The council was very desirous of falling in with the views of the Society at large; yet still it was the duty of the council, and not of a meeting of the Society (unless specially convened for the purpose), to appoint a committee.

Mr. Malone suggested, that if the names were not added there would ensue the anomaly of a chemical report from other than chemists; and was proceeding to move accordingly, but was stopped by the Chairman, stating that it was unnecessary to make a substantive motion, as he was sure the council would attend to the suggestion.

The Chairman announced the presence of M. Voigtlander, and hoped that gentleman intended to impart to the meeting some of the knowledge which had made his name so celebrated throughout Europe.

M. Voigtlander simply responded by a bow.

Mr. Roger Fenton asked to be allowed to show some copies of pictures taken by Mr. Thurston Thompson (by means of a Ross's lens, constructed upon the principle recommended by Professor Petzval), which were all that could be desired, but stated that there was a gentleman present who was better able to speak of them.*

The Secretary then read a letter from Mr. Kater, dated 46, Sussex Gardens, March 6, 1859, relative to the comparison of lenses, the manufacture respectively of MM. Dietzler and Voigtlander, of Vienna.

He stated that, having attended at M. Claudet's gallery, by invitation, to witness a trial of quality between the lenses above indicated, two sheets of *The Times* newspaper, in every respect corresponding with each other, were pasted upon a screen; the lenses attached to similar cameras being covered up so as to prevent the possibility of noticing the maker's name of either, but being indicated by the letters A and B, were examined as to the images formed by each upon the ground glass screens. This was done repeatedly, and in every instance the same lens was found to produce the most brilliant and sharpest image. On uncovering the lenses, the one pronounced the best was found to be that manufactured by M. Voigtlander. On removing the posterior combination from M. Dietzler's lens, and substituting the corresponding part of M. Voigtlander's, the performance of the former was found to be improved, but still somewhat inferior to M. Voigtlander's lens entire.

A similar proceeding was then adopted with the "orthoscopic" arrangement of each maker, with similar results; and in addition the flatness of field was ascertained to be considerably in favour of M. Voigtlander's lens.

Moreover, the mechanical arrangements for facilitating the adaptation of the front lens of the portrait combination, to form it into the "orthoscopic" lens, were far more convenient in M. Voigtlander's than in M. Dietzler's production.

No pictures were taken, a simple examination on the ground glass screen being alone adapted.

The Chairman intimated that the letter was read as expressing the opinion of the writer, but not of the Society, and hoped the meeting would have the advantage of observations from Mr. Voigtlander and others.

The subject of lenses was one upon which great difference of opinion might arise, not simply from the circumstance of what astronomers called the personal equation (the mode of observing), but also from the extreme difficulty of making lenses all perfectly alike, therefore, it would be interesting if any gentleman who had studied the subject would then make remarks that might lead to a discussion upon that which really wanted elucidation.

Mr. Mayall stated that some time since Mr. Joubert did him the honour of lending him one of the Petzval lenses, made by Dietzler. Mr. M. carefully examined it in comparison with another of the same diameter, by Voigtlander, and went very carefully through a series of experiments, first, to ascertain that the curves of the two lenses were the same, because he believed it had been stated that M. Voigtlander had deviated from the formula which Professor Petzval had first given, and that consequently his lenses were not of the quality exhibited to this Society, and upon which a paper was read by Herr Paul Pretsch.

Mr. Mayall found, after very carefully measuring the curves, that there was scarcely any deviation, except that in the last curve there was a very small difference—the one being 17·50, and the other 18; however, in testing them upon *The Times* newspaper, and some other tests of a similar kind (a very excellent one being a lady's dress, with a small check), there was no comparison in point of quality—Voigtlander's lens was very much superior—in fact it was so much so that it had been his (Mr. Mayall's) intention

* These were copies of portions of the Cartoons of Raphael and other works of art, and demonstrated the applicability of the orthographic lens to the purpose of producing faithful transcripts from *flat surfaces*.

to propose an examination by the Society into the qualities of lenses. Other Societies were doing something of the kind—the Photographic Society at Edinburgh had entered into some experiments, and this Society ought not to be behind.

A committee should be established upon precisely the same footing as the committee to examine collodion; there need be no more mystification—every one ought to know what lenses or series of lenses he had better adopt, and this would excite the opticians in future to do something superior. The great quality of a lens, that possessed by Voigtlander's, is shortness of focus—he (Mr. Mayall) could teach a boy in two months to grind a lens of a long focus that would take a good picture, but the difficulty is to make one of a short focus to cover a large field; by shortness of focus one gets an increased amount of light, and if you reduce the aperture so that the area through which the light passes shall be equivalent to that in a long focus lens, we get that which is technically termed fore-depth.

He would suggest the formation of a committee, consisting of Mr. Malone as one, that gentleman's practical experience having been very considerable; Mr. Claudet as another, though he (Mr. Mayall) did not know whether he was a member; but there was Mr. Shadbolt, and one or two other gentlemen, who would form a nucleus, and they might have power to add to their number.

Give to each optician notice that he should send to the committee his very best production, of a given diameter; then let the committee select promiscuously from each maker's lenses another one, so as to be able to test that which each maker professes to be his very best, and that which he ordinarily delivers to the public: by that means we should enable a photographer, with abilities of no great calibre, to select his lenses (which it must be remembered are none of them perfect, every one having a series of errors balanced so as to give the maximum results). This object could only be obtained by a number of gentlemen examining and comparing them, and giving a report which the Society would adopt.

Six years ago, when meetings of this Society were held at the rooms of the Society of Arts, he had made the same observations: he (Mr. M.) felt that any one choosing to advertise in the Journal of the Society should advertise on the *outside* sheet and not in the interior. It was high time that a scientific journal should put down such a system; for the future the scalping knife should be used in relation to many of the papers read.

As we know that this house, like another house, is about to disperse, and, as summer time is coming, we shall be out at different places collecting the beauties of nature, we ought therefore to have one or two lenses that we know are the best of their kind. He hoped he had said nothing which might appear invidious to any gentleman; if he had, he begged to apologise. He simply desired a committee to inquire which may be the best lens procurable—whether it be Ross's, Voigtlander's, Shepherd's, or anybody's—and therefore moved, that a committee be formed, naming Mr. Malone, Mr. Shadbolt, and any other name which might suggest itself, with power to add to their number.

The CHAIRMAN believed that such a course of proceeding would be quite contrary to the practice of all scientific bodies in London, and probably of Europe. As a body, except under particular circumstances, societies do not engage to pronounce opinions upon matters such as Mr. Mayall had suggested. That it was extremely desirable and for the advancement of science that such a committee should be appointed, might possibly be true; but if it were adopted with a view to extracting an opinion from the Photographic Society, that this or that maker's lens is the best, it would be contrary to the principles of regular scientific societies. There could be no doubt that an opinion from a committee of gentlemen would be very valuable; yet there appeared to be doubt whether the question of the formation of such committee ought to rest solely with the council, or to be delegated to the Society. He called on Mr. Fenton, as more experienced in presiding over the Photographic Society, for his opinion upon this point.

Mr. MAYALL said that he could obviate all difficulty by simply withdrawing names and proposing a committee.

Mr. ROGER FENTON felt that he had been enjoying the *otium* of a private station during the evening, and had been relieved from the cares of office. He thought, with the Chairman, that all committees should emanate from the council. He had no doubt that any suggestion of Mr. Mayall's would be considered by the council. He pronounced the subject one of the greatest importance. He had been engaged in comparing the working properties of different lenses whenever the weather permitted, and other gentlemen had been similarly occupied, and he was sure that he did not feel himself in a position to pronounce an opinion, and considered that it would be much more difficult for a committee to meet together and come to any definite conclusion. The only way that any satisfactory one could be arrived at, would be by a certain number of lenses being supplied to each gentleman of the committee to work with for a season, taking pictures with them under all circumstances, making careful notes of their performances, and giving their results in the form of a report to the Society, and then leave the members of the Society to form their own conclusions. He did not think that taking a lens, and looking at the image produced by it on the ground glass, and comparing it with another, would be a proper test, although one certainly might see if the *lines* were straight and the light good.

The CHAIRMAN stated that it would, perhaps, be satisfactory to Mr. Mayall to know that the council had that very evening been engaged in a discussion upon the precise subject; and the difficulty which struck the minds of them all was, that although you might get a very excellent lens from a maker, and which might prove very superior in character, yet that you could not be certain if you wanted another similar one that you could obtain it.

A member was about to second Mr. Mayall's motion.

Mr. LE NEVE FOSTER rose to order: the question was one of business of the Society, which could only be discussed by the council, or by members at a special general meeting convened for the purpose. The ordinary general meetings were for the purpose of reading papers. With all due deference, although he might be wrong, he suggested that Mr. Mayall should withdraw his motion, or, rather, that the Chairman should not accept it.

Mr. HARDWICH protested against the appointment of a committee to be worked in the way Mr. Mayall suggested. If the committee were appointed it ought to discuss the principles of manufacture of the lenses. When a member of the Society comes forward with a formula and offers it to the Society, then the Society is at liberty to communicate it to the members, and to state in the Journal what are its abilities *in their hands* to accomplish. If they found a defect in any particular kind of lens, they should state it with such recommendations for remedying it as might suggest themselves; but to say that they found one maker's lens better than another's would be decidedly invidious. How again do we know that any optician is able to produce them uniformly good? Would twenty lenses from the same maker be all equal in quality? Angry feelings would be generated in the Society, and thus more harm than good be produced.

Mr. MALONE agreed with much that Mr. Hardwich had said, yet, nevertheless, joined issue with him and the gentlemen on the other side upon the whole subject. For a long time he (Mr. Malone) had advocated the formation of this committee, and had been told by gentlemen who were interested in the management of the Society that they could not, as a body, give an opinion, or enter into an examination of questions of this kind, and yet, in the face of that assertion, at our last meeting a proposition was made in a very ambiguous manner for the formation of a committee for the investigation of collodion. He was not present, but it appeared to him, from the report, that the committee was together to have an opportunity of comparing a presupposed better collodion with others, the condition being that the makers of other kinds should communicate their method of manufacture.

The CHAIRMAN requested Mr. Malone to confine the discussion to the question of the appointment of a committee for the investigation of lenses, and expressed an opinion, that if the question were whether the power of appointment were vested in the Council or in the present meeting, that question could not be discussed without previous notice.

Mr. MALONE still thought that if the Society allow the formation of a committee for the examination of collodion, it should, upon the same principle, allow one with respect to lenses.

Mr. MAYALL would simplify the matter by withdrawing the motion, and make it a recommendation or suggestion to the Council. He cared not from whom the committee emanated, provided he got it; but it was advisable to be in order if they could.

The CHAIRMAN stated the council would not lose sight of it.

Mr. MAYALL said he would not lose sight of the subject, if the council did.

The CHAIRMAN then appealed to the meeting for opinions upon the interesting subject of lenses, and also, personally, to Mr. Voigtlander, but no discussion ensued, upon which

Mr. HARDWICH stated, that finding that a member of the Society, who had promised to read a paper at that meeting, was prevented by illness, he (Mr. H.) had hastily thrown together the following remarks upon some dry collodion experiments which he had made in conjunction with Major Russell. The observations were made

while working in the Laboratory of King's College, and other places, upon the question of the manipulation of dry and wet collodion.

The following is an abstract of Mr. Hardwich's paper:—

After stating that the absence of free iodine, and the presence of bromides in proper proportion, were not the only points of consideration with regard to collodion for dry plates, and comparing the qualities of those collodions made from pyroxyline, producing films of a contractile and horny character, or of a powdery nature, he gave the preference to the former for securing delicacy of half-tone, and to the latter for intensity of image; but, inasmuch as the great intensity is with dry collodion plates, apt to degenerate in practice into the formation of negatives: having too violent contrast between light and shade, and too little of the chief charm of first-rate photographs — middle tints — he considered it advisable, if possible, to employ for dry plates the former kind, although it might perhaps involve extra trouble and difficulty; the chief being, perhaps, liability to blistering during the developement, and another, the frequent stripping-off of portions of the film during the subsequent drying, especially when conducted by the aid of artificial heat.

He mentioned various experiments made by Major Russell, to whom he was indebted for some valuable hints connected with dry processes; amongst others, that of removing the whole of the free nitrate of silver by means of a weak solution of salt and water, afterwards washing the plates in pure water, and then, in order to attain sufficient density of image when developing, giving a final wash before drying the plates, previously to their exposure, with saturated solution of gallic acid. It being requisite, before application of the last solution, to make sure of the absence of free nitrate of silver that necessitates the employment of the salt and water.

He approved of the plans recently adopted of coating the glasses with a substratum of some other material previously to the application of the collodion, partly in order to attain more perfect adhesion of the film to the glass, and partly to gain more exalted sensitiveness. He considered that to Mr. Barnes photographers are really indebted for the suggestion of a film applied in the manner indicated, as can be readily shown by reference to the second edition of that gentleman's pamphlet on the preparation of dry collodion plates.

He then considered the various materials that might be employed for the preparation of the substratum, and desired if possible to avoid the use of gelatine or albumen, because if, as was very probable in preparing the plates, a portion of either of these substances became attached to the backs of the plates, and thus would not be subsequently covered by the collodion, it might, and probably would in time, tend to disorder the nitrate of silver sensitising bath.

He had tried therefore to substitute something upon which a solution of nitrate of silver would be inert, and had employed for this purpose, with some success, a solution of *caoutchouc in benzole*, in the proportion of two grains of the former to one ounce of the latter. This solution had the advantage of being readily applied to the glass without heat, the benzole evaporating in a few minutes of time, and the mode of application being precisely similar to that of collodion itself.

Plates so treated might be subsequently prepared by any of the methods for dry collodion.

By using his ordinary negative collodion he conceived that he had gained an advantage in the time of exposure being reduced nearly one-half.

Specimens were exhibited, showing great delicacy of half-tone. The author alluded to some disadvantages that were at present apparent, but which might probably be obviated; for instance, although more sensitive, he considered that the plates prepared thus, would scarcely keep quite so long without deterioration, and that Mr. Rosling, who had tried them for collodio-albumen plates by Taupenot's method, found that a peculiar rupture of the film when drying is apt to occur, the cracks appearing in circular lines.

Mr. MAYALL had seen the specimens, and was still of the opinion that he could produce a better picture with albumen alone, than with a mixture of albumen and collodion. Mr. Hardwich's spreading a thin coat of India rubber upon his glass, got rid of many imperfections in the glass, but he (Mr. M.) was afraid it would introduce many others. He preferred confining himself to as few surfaces as possible, and more particularly in dry processes; he believed also that upon that subject there ought to be a committee, as the wet process was becoming so valuable, and as the keeping qualities of a wet collodion plate could be suspended for three quarters of an hour, we had not the same difficulties now to contend with as formerly. It was the suggestion of Mr. Maxwell Lyte, of very small quantities of nitrate of magnesia in the bath. As Mr. Shadbolt was present, Mr. Mayall stated that he knew a gentleman in Perth who had been working the honey process with a success he (Mr. M.) had not seen equalled, and he thought he could bring that gentleman to the next meeting of the Society. Mr. Mayall would be happy to join any two or three others to compare the merits of albumen alone, or would undertake to teach any six gentlemen, and devote an hour a day to them, until they were perfect in the albumen process alone, in which case, by the end of this season, a series of notes could be made which would be very valuable. He had a horror of mixing things: two films he thought enough, but Mr. Hardwich now proposed a third. He (Mr. M.) could say very little upon the paper which had been read, for he thought the experiments were comparatively new and incomplete, but if Mr. Hardwich would supply him with some of the material he would endeavour to experiment upon it, and discuss it at the next meeting.

Mr. MALONE stated that he had Mr. Mayall's horror of mixtures, but inasmuch as albumen alone was not so sensitive as albumen on collodion, the mixture must be adopted. There is a peculiar crispness with albumen alone which is superior to the collodion with which no albumen is used, and the admirable result of albumen alone is retained in albumen upon collodion.

Mr. MAYALL forgot to add his belief that Mr. Malone, and all the operators upon albumen alone, lost sight of the great principle he had stated in a paper on the subject, that of exciting the albumen *with dry vapour of iodine*, by passing it over the iodine box for two minutes before it went into the silver bath, which made it quite as sensitive as collodio-albumen. He thought there was more to be done with gaseous iodide on a film of albumen and gaseous bromine than has hitherto been done. He believed that Mr. Malone himself, in the *Athenæum* some years since, suggested a small portion of bromine to increase the sensitiveness of albumen.

Mr. MALONE was much obliged to Mr. Mayall, but still thought the combination of collodion and albumen preferable. Mr. Hardwich (having made public his mode of operation) would excuse him for asking whether, when making pyroxyline, upon failure in producing the desired result he might take the specific gravity of the acid as sufficient; in fact he thought Mr. Hardwich had modified his opinion upon that, and had found that owing to the difficulties of manipulation, science was of no avail, and that one must go by the rule of thumb, and add water before the desired result could be obtained; and he would also ask whether the kind of cotton employed matters, and if so, what kind of cotton should be used with that formula?

Mr. HARDWICH stated he thought that the specific gravity of the acid was not of itself sufficient, but it was the only guide he could give, and that would sometimes deceive, because the acid might occasionally contain sulphate of potash, or another substance which would throw out all their calculations. Make your mixture from the specific gravity, and if you find it is too weak then increase it. With regard to the best kind of cotton, he was not quite certain; he had twenty different kinds from all parts of the world, but in the meantime he used the best he could get, combed free from the dust or straw, or whatever it might be. He must say, if one failed the first time try again.

Mr. SEBASTIAN DAVIS prepared some plates during the last twelve months, went into the country and exposed them. As far as the dry process went he could not alter them, except as to time of exposure, and he found that to bring out the details of shadow and the foliage properly he wanted from ten to twelve minutes.

Mr. F. G. ELLIOTT, some time ago, having worked with the dry process had used common cake india rubber dissolved in coal tar naphtha as a substratum, and it kept the film from moving, but it afterwards cracked in all directions.

It being late the meeting then adjourned.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

AT the ordinary monthly meeting of the above Association, held at Myddelton Hall, on Wednesday, the 30th ultimo, Mr. JOHN BARNETT in the chair, the minutes of the previous meeting having been read and confirmed, the following new rules were proposed and adopted:—

"That at the ordinary meeting in February the officers for the ensuing year be nominated, any member being at liberty to propose names."

"That the payment of five guineas in one sum constitute a life-member."

The proposed alteration in Rule 4—"That the word 'Vice-president' be expunged, and the words 'Two Vice-presidents' be

substituted"—was, after a lengthened discussion, negatived by a majority of two.

The following report was then read by the Secretary, and agreed to:—

SECOND ANNUAL REPORT.

The Committee has great pleasure in laying before the members the second annual report, and congratulates them on the increasing prosperity of the Association.

The following papers have been read at the ordinary monthly meetings:—

By Mr. J. DUTTON ......" *On some Experiments connected with the Waxed-Paper Process.*"
„ Mr. J. A. JUDGE ...." *On the Wet Collodion Process.*"
„ Rev. J. WINTER......" *Observations on the Calotype Process.*"
„ Mr. G. SHADBOLT ..." *On Focussing the Camera.*"
„ Mr. T. A. BARBER..." *On the Causes of Failure in the Oxymel Process.*"
„ Dr. RYLEY ...." *On the Modification of the Collodio-Albumen Process.*"
„ Mr. MCCRAW........." *On an Iron-Printing Process.*"
„ Dr. HILL NORRIS ..." *On the Dry Processes.*"
„ Mr. M. HANNAFORD.." *On a New Iron-Printing Process.*"
„ Mr. M. S. LEGG......" *On the Delineation of Microscopic Objects.*"
„ Mr. M. HANNAFORD.." *On some further Experiments in the Iron-Printing Process.*"
„ Mr. M. HANNAFORD.. *Ditto* *Ditto.*

A number of subjects of interest and importance have been brought forward for discussion, and many novelties and improvements in apparatus, &c., have been exhibited at each meeting; and the Committee takes this opportunity of again thanking its friends for their kind assistance in promoting the welfare of the Association.

The Committee feels gratified that the substitution of *The Photographic Journal* for the *Journal of the Photographic Society* has given general satisfaction to the members, and desires to express its high appreciation of the services rendered to the Association, and the art of photography generally, by Mr. Shadbolt, the esteemed Vice-president.

Although the expenses during the past year have been considerably augmented, in consequence of the increased outlay caused by the distribution of the Journal fortnightly, instead of monthly, the presentation of the photograph of Rochester Bridge to each member, and from other causes, the Committee has great pleasure in stating, there is still a balance in hand; and trusts to be in a position, not only to continue all the advantages hitherto enjoyed by the members, but to embrace any opportunity that may offer of increasing them.

The assistance and co-operation of the members are invited in procuring a negative, from which to print a presentation photograph for the ensuing year.

In conclusion, your Committee cannot forbear congratulating the members generally upon the good feeling evinced at all the discussions that have taken place, and the universal readiness to communicate information for mutual benefit, which has formed so marked a feature at all the meetings.

(Signed) J. BARNETT, *Hon. Secretary.*

It was moved by Mr. BARBER, seconded by Mr. HILL, and carried unanimously:—

"That the members view with regret the resignation of Mr. J. S. Moon, through ill-health, from the office of Hon. Secretary, and that the best thanks of the Association be given to him for the very efficient and kind manner in which he has discharged his duties since the formation of the Society; and that this expression of their regard for him be added to and printed with the report."

The CHAIRMAN having announced that as this was the anniversary meeting, it would be necessary to choose officers for the ensuing year; and, there being no opposition to their nomination, the following gentlemen were elected:—

CHARLES WOODWARD, Esq., F.R.S., J.P., &c., *President.*
GEORGE SHADBOLT, Esq., *Vice-President.*
D. W. HILL, Esq., *Treasurer.*
JOHN BARNETT, Esq., *Hon. Secretary.*

The Committee were then ballotted for, and from the eight nominations the six undermentioned gentlemen were elected:—Messrs. Barber, Hannaford, Hislop, Moens, Moon, and Shave.

The following gentlemen were duly elected members of the Association:—Messrs. F. Eck, H. Evans, J. Gowan, E. Heseltine, G. Peevor, G. W. Simpson, Davis Sims, and J. Whitehead.

Mr. DAWSON exhibited some very beautiful photographs by Wilson, of Aberdeen.

Mr. W. HISLOP, F.R.A.S., described and exhibited his lantern for illustrating lectures, &c., by means of photographic transparent positives on glass, for the enlargement of microscopic objects, and for other purposes (see page 92).

A vote of thanks was passed to Mr. Hislop for his description, and the pleasing exhibition which accompanied it.

It was moved by Mr. MORLEY, seconded by Mr. BINGHAM, and carried *nem. con.*:—

"That the thanks of the Association be given to all the officers for the past year, for their good management and successful efforts in bringing the Association to its present state of prosperity."

After the usual compliment to the Chairman, the meeting separated until Wednesday, the 27th instant.

LIVERPOOL PHOTOGRAPHIC CLUB.

ON Tuesday evening last, the fifth meeting of the above Club was held at Mr. Keith's Rooms, Lord Street.

After the reading of the minutes, Mr. FORREST addressed a rather numerous meeting, by saying, that he was much indebted to friends, who had suggested the use of mercury, as increasing the intensity of the photograph. He had found, as it was foretold, that the mercury had induced a ready deposit of the copper from the battery; but he had yet to complain of a difficulty in more strongly marking its half-tones, and the imperfect delineations of more delicate photographs. To obviate this and further the additional deposit of the copper, he had surrounded the picture on every side with copper wire; and was disposed to think that the covering of copper gauze wire would farther facilitate the deposition.

Mr. LEITHEAD advised tinfoil as being a more ready conductor of the necessary weak galvanic current.

Mr. COREY conceived that a more subtle means of inducing a current was not the object in view; but the greater susceptibility of the surface to receive the effects of that current was the requisite sought for. That, as it had been admitted, the application of mercury, whilst it intensified the image, also facilitated the formation of the film of copper, the object must be to increase that susceptibility. Now, all electrotypists were aware that, when articles were to be coated with metal, certain portions obstinately repelled the influence of the battery, and a deposit could only be accomplished by washing with a solution of protonithate of mercury. Why not, then, increase the portion of mercury already united with the silver, by washing with this solution?

Mr. DUTTON (a visitor) remarked that the great reducing qualities of grape sugar, and of the essential oils, might be rendered available, inasmuch as they reduced silver in its metallic form, so also copper might be thrown down in graduated proportion upon the surface of the glass by their use.

Mr. R. COOK advocated the application of phosphorus, dissolved in bisulphuret of carbon, to facilitate the farther deposit of silver.

Mr. KEITH could not see the feasibility of this mode, as an even film would be left over the entire surface of the plate, obscuring lights and shadows alike.

Mr. COREY could see a fresh field opened out by Mr. Cook's idea, which would, he hoped, do away with the cumbrous action of the battery altogether. He remembered the very earliest efforts of Mr. Berry and himself, and now possessed a negative taken five years ago. Finding that the negative was too weak, Mr. Berry, after the photograph was varnished, had washed it with an alcoholic solution of chloride of gold, and then blackened with sulphide of ammonium. This process was frequently brought before the notice of members. Now, he was firmly of opinion that this would give the adequate intensity Mr. Forrest required, and would place this negative at his disposal.

Mr. FORREST accepted the offer, and would report its effect at the next meeting.

Mr. DOYLE (a visitor) introduced a few specimens of what he proposed to call Chromatypic Printing. True, it was based upon Mr. Hunt's process, but he had differed in certain particulars. He would feel at liberty so far to announce, that it was by the use of bichromate of potass, and metallic precipitates, resulting from various re-agents, forming pigments, exhibiting a diversity of tone, and variety of hue, entirely different from silver.

These specimens were remarkable for a very clear and sharp definition, but were wanting in force.

Rev. T. BANNER exhibited a very compact little contrivance for sensitising and developing stereoscopic plates in the open air.

Half-way down the three legs of an ordinary camera stand a shelf was supported; a covering of velvet, impervious to light, was stretched from this, and over the top. Having small sleeves fitted by elastic bands to the wrists, with a coloured glass eyepiece, and a small window of the same, an expert operator, with the focussing cloth thrown over his head, was enabled to see all the needful operations of his own handiwork, as distinctly as if unfettered in a room. Its portability and simplicity were much commended.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the evening of the 6th instant, at the Rooms of the Literary and Philosophical Society, Mr. SIDEBOTHAM, V. P., presiding.

A new member was elected, and Mr. Hardwich was elected an honorary member of the Society.

The CHAIRMAN then made some lengthened remarks on micro-photography, &c. [See page 91].

After the remarks made by Mr. Sidebotham, a number of specimens taken by Mr. Dancer were then exhibited to the members by the aid of a microscope. Amongst them were the following, prepared specially for the occasion:—A page of printing, from Quekett's "Treatise on the Microscope," reduced to such size that the whole to the volume of 560 pages could be contained in a space one inch long and half-an-inch broad,—(*fig.* 1)—the page contained 2118 letters. Two pages of Quekett's "Treatise on the Microscope," reduced to one-sixteen hundredth part of a superficial inch; they included 3631 letters, and at the same rate the whole volume could be contained in a space of three-eighths of an inch square—(*fig.* 2). This specimen excited considerable attention, being so exceedingly minute, notwithstanding which every letter was perfectly sharp and legible as the original printing, under a high magnifying power. Another specimen contained the written name and address of the Chairman, along with the date, in a small space the size of a hole punctured by a fine needle.

Fig. 1.

Fig. 2.

At the conclusion of the Chairman's remarks,

Mr. DORRINGTON read a paper to the Society, *On Printing Glass Transparencies.* [See page 91.]

Mr. SIDEBOTHAM said he thought Messrs. Dorrington and Nevill's process a very good one, having tried and found the plates more sensitive than collodio-albumen.

A great number of stereoscopic transparencies were handed round, and were considered exceedingly beautiful, being very brilliant and good in half-tone.

Mr. PATTISON also showed some specimens taken by him—taken with dry collodion on the gelatine, which were much admired.

Mr. PARRY called the attention of the meeting to the circumstance of his having written on the collodio-albumen plate with a black lead pencil, and on developing the plate he found the traces of the pencil, though faint, developed very black and sharp.

Mr. MABLEY explained a curious circumstance which he had met with: having coated a prepared collodio-albumen plate with collodion, for the purpose of taking a picture by the wet process, he found, after exposure and developing, that the picture developed very intense, and having afterwards rubbed the collodion off the surface of the albumen, and again coating it, and exposing, and developing, and afterwards rubbing it off again, he found no traces of the picture in the collodio-albumen film.

A vote of thanks was passed to the Chairman and the proceedings closed.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE Monthly Meeting of this Society was held at the Odd Fellows' Hall, on Tuesday Evening, the 29th ult. WILLIAM HOWELL, Esq., one of the Vice-Presidents, occupied the Chair.

The lecturer for the evening was Mr. JOHN JOHNSTONE, of New Street, Birmingham, one of the most scientific photographers in the Midland district.

He commenced by saying that it had been his intention to have devoted the evenings of the previous week to writing out what he intended to bring before them that evening, but as an unforseen occurrence, of rather a disagreeable nature, had absorbed the whole of his time, he had not even had time to turn the matters over in his mind.

He believed the subject announced was, "*On some of the Essential Requisites in the Production of a Good Photographic Picture.*"

One of the first essentials was a good camera-box and lenses. The interior of this box should have two or three diaphragms covered with black velvet, so placed as to prevent any reflection falling on the area of the picture. In his (Mr. Johnstone's), early experiments on lens making, he always found for a single lens that the old original curves of Dollond, for telescopes, was really a better construction than the modern make. In all the older makes, the concavity of the outer flint surface is much greater than the modern form, and hence arose a flatter field. It would be impossible to use a large opening with a single lens, to get a perfect image, and consequently, in taking portraiture, where the large opening is essential for the sake of diminution of time, there the second lens is brought into play, to counteract the aberration of the oblique rays. In Voigtlander's lenses there was always noticeable a peculiar brilliancy of definition in the centre of the image on dead glass, and he (Mr. Johnstone) never met with a French lens which had this peculiarity in such a high degree. He believed this was to be attributed to some extent to the kind of glass Voigtlander uses. For many years all his flint was made at the glass house in Blackfriars, where Dollond's glass was originally made. It was considered a light flint, the specific gravity being about 3·2-10ths, while the specific gravity of some of the French lenses was as much as 3·6-10ths, and consequently a much denser and more refractive glass. But though there was an advantage arising one way from the use of heavy flint, there was a disadvantage arising in another. If they took two prisms, one of crown and one of flint glass, and allowed a beam of sunlight to fall upon them, so that the two spectra should be exactly of the same length, it would be found that though the extremes of the violet and the red fit exactly, the central part of the spectra do not. Consequently, no lens formed with two pieces of glass can ever be brought to be perfectly achromatic as to colour. There was always a little outstanding colour that never could be overcome; and in proportion to the density of the flint, the greater the disparity of the spectrum. Dr. Blair overcame the difficulty many years ago by a fluid lens, and Mr. Archer, of London, was said to have made one on the same principle.

After pointing out the necessity of having the edges of the lens a dead black, and of placing two or three diaphragms in the tube, to prevent reflection from oblique rays, Mr. Johnstone went on to speak of the defects found in photographic paper, which is not now so good as some made by Turner, eighteen or twenty years ago. On visiting Turner's mill eight or nine years back, he found a salt in use, named anti-chloride, which, on testing, he found to be a sulphate of soda, and which no doubt materially affected the quality of the paper chemically. French paper is superior to ours in texture, but that is the only good quality it has. Owing to the size being of a resinous soapy nature, it is often alkaline, and is frequently deposited on the surface in little clots, which become detached in the fixing, completely spoiling pictures; and the artificial ultra marine, used in colouring French papers, having sulphur in its composition, probably accounts for the rapid decomposition of the sensitive surface. By immersing French paper in a solution of chlorine, and using a little warm water, both the blue and the insoluble size might be removed, and when dried and re-sized with gelatine, coagulated with alcohol, it might be iodised or sensitised in the Talbot manner, and would be found to work perfectly.

As to manipulation, he believed the single and double washings were alike good; but there was one advantage in the single washing, when they had the silver and the iodide combined: they had a large excess of iodide of potassium, which dissolved the metallic particles in the paper, and freed it from black specks. Remarking as to the waxed-paper process—he hoped ere long to bring before the public a theory of photographic action that would explain how it is that a sheet having its fibres filled up with bees' wax, bears keeping in a sensitised condition, stands developing so much longer, and produces a clearer negative than a plain sheet of paper; and likewise to explain the reason of every change produced through the whole range of photographic action.

Mr. Johnstone referred to collodion and the process of manufacture, remarking that probably the time would never come when they would get a collodion perfect in all things. With new collodion you get a a full developement, but it is feebler than if it had been older; keep the collodion for a few days, and vigorous pictures are obtained; a few days more, and lights are high, shadows intense, and a longer time in the camera is required to bring out the half tones. In the developing solution, a certain amount of acid was required, and in the bath acid was also desirable with some collodions. The bath and the collodion should always be accurately adapted to each other. With new collodion, and a neutral bath, the image starts out rapidly all over when developed, but with old collodion, using the same bath, it does not so act. The high lights begin to exhibit themselves first, and it gradually goes on until checked at the proper time, and when fixed there is a well balanced picture, lights intense, and the blacks clear. The same bath is not adapted for

a new that is so for an old collodion. A neutral bath would work safely with an old collodion, and not with a new one; for this reason, that with a neutral bath, and with a new collodion, the affinities of the different materials are so nearly balanced, that if you happen to develope slightly beyond the proper time, you get a foggy result.

But with the same bath and old collodion, you have got a little free iodine in the film. Of course the decomposition takes place in the nitrate of silver bath, and the iodide of potassium in the film, but the free iodine takes up a portion of silver from the bath, and leaves a little nitric acid free. This being of necessity in the film in the first place, the consequence is that when you come to develope, after a slightly longer exposure, a much clearer picture is the result, as the free nitric acid in the film prevents all tendency to fogging. The acid developer will not fully make up for this quality which the old collodion possesses. When you put your coated plate into the bath for a given time, the whole of the iodide salt with free iodine in the film is changed into the silver salt, leaving a little free acid. A bath being neutral, it will have a tendency to take up a portion of nitric acid from the film, so that if you leave a plate in double the time of the former plate, you cannot expect the same results, as you have an alteration of the condition existing before. Another point connected with collodion was the cause of the change which takes place in the collodion solution after being iodized. They knew, from experience, that iodide of potassium, when used alone, changes in a few days—that iodide of ammonium changes more rapidly still—and that iodide of cadmium does not visibly change. The cause of the change had been attributed to the ether becoming acid, from age or other causes; but he conceived that it rather arises from the decomposition of the gun-cotton, which is a very changeable substance. After referring to the improvement which had been the result of the introduction of gold, and mentioning that he used common salt in his toning bath, six or seven years back, Mr. Johnstone referred to the carbon printing process, and the ink process introduced by M. Sella. In the latter, bichromate of potash and sulphate of iron were used, the paper being exposed to the light under a negative, the parts where the light has not acted being afterwards washed out, and the sheet subsequently washed with a solution of gallic acid. The result was a kind of ink, but he thought it very clear that the originators of the process knew but little of the principles of dying or calico printing. It is well known amongst dyers, that in using a peroxide of iron to produce a black with any material whatever, it will not be a lasting black, but when exposed to the atmosphere, will become of a rusty brown. In producing a good lasting black, it is necessary that the iron should be in a state of protoxide, and that the vegetable matter combining with it to form a black, should, previous to combination, be soluble. Gallic acid is not a good material for obtaining a black; tannic acid being preferable. He then recommended the members curious in experimenting, to take chromate of potash, with sulphate of iron to prepare the paper, expose it, wash out all that is soluble, put the print into a flat vessel, with a strong decoction of tannic acid upon it, and when boiled for a time, you get a sheet of solid black. Wash it well, put it into a solution of chloride of lime, and eventually the parts where there is no mordant will all bleach white; but where the mordant has become fixed in the paper, that will resist the chloride for a sufficient amount of time to allow other parts of the sheet to become clear. He thought, that in this way, a more permanent black dyed sheet may be produced than by any other plan which has been suggested.

Mr. Osborn in moving a vote of thanks to Mr. Johnstone alluded to the benefit the society had already received, in having amongst them a man of Mr. Johnstone's high attainments. With regard to carbon printing, the process mentioned by Mr. Johnstone, as suggested some time since, had been re-discovered by a Mr. Mabson, but this matter had been put right in the Journals. He hoped that they would have to listen often to Mr. Johnstone's floating ideas.

The resolution was passed unanimously.

Letters to a Young Photographer.

No. VIII.

My Dear Eusebius,

There is one little operation yet to be performed before you can take a picture, which, although not before alluded to, has not been lost sight of. But I have kept it in the background, lest the contemplation of so many items of preparation should discourage you. Collodion pictures, I need not remind you, are taken on glass plates. And it is very important that the plates should be scrupulously clean. Now it might, at first sight, appear that any fool could clean a bit of glass; but give one to Betty, or to Buttons, and see how they will polish it off! You might be able to see your face in it, it is true; but your picture would develope up some inexplicable signs and wonders, which, in your simplicity, you will attribute to that —— collodion, or to that *cussed* developer, or to some other than the right thing. If you set your mind upon obtaining a good picture, you must clean your plates yourself. I always do mine, and I set about it in this fashion:—

If the glass is new from the glass-cutters, I apprehend there is nothing to clean off but greasy finger-marks, dust, &c. Now, strong alkali suffices to attack grease, and you may use *liquor ammonia*, if you stop your nose, or American potash, one or two ounces to the pint of water. Dip or soak the plates in this solution, and rub the glass all over with a soft nail-brush; this will effectually remove dirt and grease, and a good rinsing in plenty of clean water completes the operation. Set them up on one corner to drain, and before they are dry rub them over with a linen bag containing whiting. This white coating, when dry, preserves the plates from becoming again dirty, and in this state they may be kept any length of time; all that is required, when they are wanted for immediate use, will be to rub off the whiting with a clean linen cloth, and polish with a chamois leather — the plate resting on some folds of thick blotting-paper. You can easily recognise when the surface of the plate is perfectly clean, by breathing upon it. If it leaves a uniform veil, free from streaks or other defects, you may consider your plate fit for use. If the veil does not appear perfectly uniform, the polishing must be renewed, and always performed immediately before the plate is covered with collodion, as the particles of dust ever present in the atmosphere will settle upon it, and cause defects in the picture. It is well to keep a large soft brush for the express purpose of removing the dust from the glass plate before use.

Plates upon which pictures have been taken, sometimes require more active treatment, so as to remove matters that might disturb the integrity of the preparations employed in taking pictures. To make sure, I keep ready a quantity of diluted nitric acid, into which I put the plates, after they have been washed free from the collodion, &c., and treated with the potash; and I leave them in the acid for several hours. Upon removing them, they are to be washed in plenty of clean water, drained, and then coated with whiting, as before directed. In handling the plates, you will take care to avoid putting your fingers on the surface; but hold them by the edges, and finish the cleaning by wiping the edges also, to remove the dust that accumulates there.

The sharp edges of new glass plates will require to be taken off, else they will be apt to cut your fingers. For this purpose a piece of grit-stone answers very well. By a little dexterity you can work a groove in one side, into which the edge of the glass will slip, and you can make rough the two edges at once. I prefer the kind of glass known as "patent plate;" but your choice will, probably, be governed by the nature of your operations.

I am aware that some operators think it necessary to proceed in a much more complicated fashion when they clean a glass plate; but I think, in so doing, they misconceive the nature of the substance upon which they exercise their ingenuity. Generally speaking, the agents employed in photography exercise no chemical action upon the glass plates; but I have found a very adherent metallic deposit sometimes, which, however, nitric acid is effectual in removing. Those operators who recommend alcohol, tripoli, rottenstone, &c., appear to consider that the glass plate requires the same treatment as the silvered plates used in daguerreotype, forgetting that in these latter a chemical action has taken place in the substance of the plate, the mechanical results of which require to be removed by abrasion of the surface before the plate is fit to receive another picture. Nothing of the kind takes place upon the glass plate; and it is only when solutions and liquids of a certain kind are allowed to dry upon glass, that deposits, producing stains, difficult of removal, are formed.

If your head is cool, and your nerves are strong, you may now proceed to coat a glass plate with collodion. I have seen many a brave man undertake this operation, but not one that failed to tremble at the first attempt. So having screwed your courage to the sticking place, take the glass plate in your left hand, by the lower left-hand corner, resting it upon the lower portion of the second finger, the thumb over it; let the fore-finger run up the edge of the glass, towards the upper left-hand corner, to steady and control it in the various movements required. Holding the plate breast high, take the collodion-bottle in the right hand, and inclining the plate slightly towards the right, pour upon the centre a

steady stream of collodion, until there is sufficient to cover the entire plate. By a slight but dexterous inclination of the plate, the whole surface is quickly covered with the collodion—first to the upper right, next to the upper left, then the lower left, and lastly, to the lower right-hand corner, from which the excess of collodion is drained into the bottle. This operation is performed much more quickly than described; the chief care to be taken is to avoid the collodion "doubling"—that is, a fluid portion running over another portion that is becoming set, which, if it occurs, will destroy the homogeneity of the film, and, consequently, the picture taken upon it. The *modus operandi* of coating a plate uniformly with collodion is a *flooding*. I know of no better term to express it. If you do not soon succeed to your satisfaction, you had best get some one to show you how it is done; but I think a philosopher of your intelligence cannot be discomfited with one or two failures; and if you succeed unaided, your triumph will be the more satisfactory to your pride and perseverance.

In a few seconds (the number of which depends upon the composition of the collodion and the temperature of the operating-room), the collodion on the plate will become set; it is then ready to be immersed in the nitrate of silver bath, which you will prepare by dissolving one-and-a-half ounces of crystallized nitrate of silver in a pint of distilled water, and afterwards adding an ounce or two of old iodized collodion; these ingredients should be mixed in a large bottle, and well shaken; after a few hours repose, filter through bibulous paper.

Photographic Glossary.

Hydracids, or Hydrogen Acids—These acids are formed of one equivalent of hydrogen, united to one equivalent either of chlorine, bromine, iodine, fluorine, sulphur, selenium and tellurium. As hydrogen forms only a single acid with each of these elements, the formulæ of the hydracids are indentical. The hydrogen acids combine with bases to form salts.

Hydrogen—A gaseous substance, the lightest of all bodies, being fourteen-and-a-half times lighter than air. It is adopted as the unit of the scale of chemical equivalents. Mixed with oxygen, it detonates with great violence, and the product of the combination is water. It is a very powerful reducing agent, but has not yet been employed for that purpose in photography.

Hydrosulphate of Ammonia—A compound of hydrosulphuric acid and ammonia, sometimes termed sulphide of ammonium. It is a gas possessing a very fœtid odour, and is always employed in an aqueous solution, which, when pure, is colourless, but becomes yellow by contact of air. It is used to precipitate metals from solutions in the state of sulphides, and is employed in photography in the treatment of residues.

Hydrosulphuric Acid—A colourless gas of a very offensive odour. Water takes up about three times its volume of this gas, and acquires its properties. By exposure to the atmosphere, the solution becomes milky and deposits sulphur. This acid is employed in photography, to extract silver from solutions containing it, by forming an insoluble sulphide of silver.

Hypochlorite of Lime—Commonly called chloride of lime, which is an intimate mixture of chloride of calcium and hypochlorite of lime; it destroys the colour of most substances, and is employed for bleaching tissues and paper, and also as a disinfectant.

Hyposulphites—Compounds of hyposulphurous acid with bases. Hyposulphurous acid exists only theoretically, as it cannot be isolated. A very remarkable property of the hyposulphites is, that of dissolving certain insoluble salts of silver, as the chloride, &c.

Hyposulphite of Soda—A salt composed of soda and of hyposulphurous acid. It is obtained in large colourless transparent crystals. It dissolves the salts of silver, which are insoluble in water, such as the iodide, bromide, and chloride, while it attacks, only very slowly, the blackened salts of silver or metallic silver, thus forming a most useful fixing agent.

Image—When a lens is presented to a given object, the rays proceeding from the latter in passing through the lens are refracted, and unite, at a certain distance from the lens, its focus, and form there an *image* of the object. The relative sizes of the object and the image are determined by the distance of the object from the lens, and by the length of focus of the lens. Rules and tables, showing the size of object and image, focus of lens, and distance of object, may be found in Lay's Photographic Almanack.

Ink-Printing Process—A method of obtaining positive pictures on paper, by the employment of the components of common writing ink, viz., tannic acid and iron.

Insolation—A French term, signifying exposure to the sun's rays.

Instantaneous Pictures—By the employment of very sensitive chemical materials, under favourable conditions, negative pictures can be obtained by an instant's exposure of the prepared material in the camera. Pictures so obtained are termed instantaneous pictures.

Invisible Rays—Recent researches have shown that there are chemical and calorific rays in the spectrum, which extend beyond the extreme visible violet and red rays, some of which are made evident by being arrested by a solution of disulphate of quinine, or decoction of œsculine, or seeds of the datura stramonium. Glass, coloured with oxide of bismuth, has also a similar property to that of the solutions named.

Foreign Correspondence.

Paris, April 7, 1859.

PHOTOGRAPHY, after enjoying its period of hybernation, is waking up under the influence of sunshine and precocious summer heat, and the photographic world resembles a hive of swarming bees. The results of last year's excursions are coming out, and when our Exhibition opens we may expect a treat, the like of which has never before been vouchsafed to us. The great rage with the public is for stereographic pictures, and artists have not been slow to minister to the prevailing taste. Many of the series of views display a vast amount of energy and enterprise, even as commercial speculations. There is no corner of the globe so distant, provided it be picturesque, that will not repay the expenses of a voyage thither, and yield a good surplus besides. The World in the stereoscope! Here is work enough cut out for a generation of photographers, work they never so nimbly. And it is not merely the *univers pittoresque* that the photographer brings home with him, but the *monde scientifique* also. In M. Smythe's *Teneriffe*, England has sent us but one scientific stereoscopic contribution; but for that one we can send you twenty in return. There is the mountain chain of Mont Rosa and the panorama of Mont Blanc, the first photographed by M. Bisson, sometimes at an elevation of upwards of three thousand feet above the level of the plains; the second photographed by M. Martens, the scientific value of which has been recognised by the *Académie des Sciences*. M. Ferrier has overrun the Alps, like a true mountaineer, from the Wetterhorn to the Appenines, and his views are the perfection and wonder of the picturesque. But I will now confine myself to describing the series by M. Bisson, taken during his ascent of Mont Blanc, which are not stereoscopic, but are in two series, one very large, the other smaller, suitable for the tourist's album or the artist's portfolio.

The series commences with the starting point, the Priory of Chamounix; and the views from this charming valley, surrounded as it is by the most celebrated mountains of Europe, show us the general physiognomy of these giants of the Alps. A most splendid panorama presents itself to our view: there is the Forest of Montanvers, with its sombre foliage contrasted against the white glaciers; beyond rises a series of gigantic mountains, from the Bochard to the *Col de Baume*, whose snowy crest cuts the distant horizon. To the left the wooded heights of *La Flegère* close the vast circle, in the foreground of which the pretty villas of Chamouny rise as out of a luxurious carpet of green verdure, through which the stream of the Arve flows, like a ribbon of silver over a mantle of dark velvet.

From this point the photographer commences his laborious ascent, and from every suitable point of view the eye is gratified and astonished with new wonders. There is the *Glacier des bois*, rising abruptly between the *Aiguille du Bochard* and *Montanvers*. The eye measures with terror the height of this colossal peak, yet it is but a step of the ladder whose summit is in the clouds. Still ascending we soon reach a little wooden chalet surrounded with a flower-garden—the *Auberge de Chapeau;* here another magnificent spectacle presents itself—glaciers, icy peaks, bottomless chasms, exhibit a varied grandeur and majesty—contrasts tha awaken ideas of the Infinite. Another stage higher and we reach

Le Courtil, an oasis in a desert of ice, a meadow enamelled with flowers amid a perpetual winter: here every emotion merges into that of solemn awe inspired by the scene. The summit of Mont Blanc appears nigh, rising a snow-crowned monarch, King of the Alps, which bow their heads around him. Here the artist pauses in his perilous ascent: it was scarcely possible to ascend higher with a photographer's baggage; but with a supply of dry collodion plates the attempt may be renewed, and a new store of wonders opened to us.

The peculiar excellencies of these productions can only be fully appreciated by one familiar with photographic perils and difficulties, and perhaps none greater are ever encountered than attended the production of these views. You will doubtless soon have an opportunity of admiring them yourself, for they will be put into circulation immediately the Exhibition is opened.

The other M. Bisson (you know it is always Bisson *frères)*, while his brother was engaged in Switzerland, occupied himself in photographing the architectural riches of the south of France. Although this section of the country had been previously visited by three skilful artist photographers, yet M. Bisson, by selecting new points of view, has contrived to give an air of novelty to things familiar. The cities of Arles and of Nismes, especially, have furnished him with some of the choicest productions of photographic art. The interior of a Cloister has all the magical chiaroscuro effects of a dioramic picture. From the Museum of Aix, M. Bisson has brought copies of the paintings attributed to the hand of the good *Roi René*.

I must not omit to add that in stereoscopic pictures a new class of subjects is obtaining great popularity: these are animated groups, illustrative of the songs of Beranger; the principal scenes in the comedies of Molière; with romances illustrated in series of twenty subjects; scenes from the *Bal d' Opera;* national dances, *cum multis aliis*.

From this you will gather that the horizon of photography is not diminishing, but rather widening every year. The public accepts these new offerings with great avidity; and very many among the productions of this branch of photography are subservient to the purposes of education. J. P.

New York, March 16, 1859.

THE item of most interest to photographers here at present, is the result of the suit of *Cutting* against a practitioner of the art for an infringement of his patent, dated July 11th, 1854, for the use of *bromide of potassium* in combination with collodion, according to the following extract from his specification. After describing the preparation of the collodion, he says: "In order to excite this collodion, take a deep one-ounce vial — introduce two-and-a-half grains of bromide of potassium, and add water, drop by drop, to make a saturated solution. In this solution, dissolve two-and-a-half grains of iodide of potassium; then add one ounce of collodion, and shake well. Let it settle clear, and decant for use. The solution must be decanted every day. In order to make the most sensitive collodion, I dissolve the bromide and iodide of potassium and the collodion *in a saturated solution of carbonate of ammonia in water*." This he calls the "Mezzographic Process." The italics are mine. The *collodion* must be dissolved in a saturated solution of carbonate of ammonia in water! His claim is, "The employment of bromide of potassium in combination with collodion," and under this he threatens every one with an injunction to restrain from the use of *any* bromide, whether in collodion, "dissolved in carbonate of ammonia," or otherwise, unless they purchase a license.

However, all is not yet lost — for, although the courts have decided that his patent is valid (judgment went by default), a certain editor has declared to the photographic world, in a circular which I send you herewith, as a specimen of his wondrous powers of *blarney*, that he desires "to be the means of contributing at least *five hundred dollars* (!) to a common fund for protection." This circular is the only notice the practitioners have received of the terrific onslaught to be made on them.

The process is said to be also patented in England, when, if so, those who dissolve their salts of potassium and collodion "in a saturated solution of carbonate of ammonia in water," may also expect an injunction — unless they shelter themselves under the wing so maternally raised to accommodate all who need its defence.

At length a photographic society has been formed in New York —at least, so it was stated in one of our newspapers a few days ago in a paragraph of three lines, alluding to it as *un fait accompli*, while the last of the lines read, "no name of any prominence appears in the proceedings." This remark does at first sight appear rather disparaging; but on criticising it, especially after obtaining an insight into the whole subject, it will be found to be as superlative a degree of praise as could, under the circumstances, be expected, since *all* our *more* prominent men were there. Our *inventor-general* issued the invitations, led off, continued and concluded the proceedings, all of which will, no doubt, appear in his journal, which is so extensively advertised as being "emphatically the organ of the art in America," notwithstanding which the practitioners so emphatically ignore its existence, that when its proprietors have a resuscitated process, or an antiquated form of apparatus to re-invent, they must have recourse to a flood of post-paid circulars to make it known to those who would use such things — an advertisement in *their own organ* being utterly unavailing for the purpose of reaching them.

To return to the society. The meeting was called by private invitations, of which it is said about forty were issued. Of those invited, very few were present — some sent excuses, whilst the greater number paid no attention whatever. But those present declared the society organized, and elected themselves its officers, besides doing every thing else requisite for the occasion, except designating "an organ." This ceremony was omitted, because the editor of the monthly advertiser was there also, and was very desirous of "having a finger in the pie," as well as our most *prominent savant* himself. With these luminaries of the art (each a host in himself) present, it is clear the newspaper reporter must have been incompetent to distinguish wherein *prominence* consisted.

By the way, European inventors must look to their laurels, or we shall henceforth show *our priority* in every useful invention, and each successful process that can possibly be thought of. This we shall accomplish in a very peculiar manner — a genuine invention of our own, with which *you* have nothing to compare.

The monthly advertiser, under its grandiloquent name of *The Photographic and Fine Art Journal*, for December, 1858, was only issued about the 1st March, 1859; while the number for January 1st is not yet out, nor is it probable it will be out for some time to come. Now it is very possible, that the number for January 1st will contain a notice of the formation of the new society, which event did not take place till March, or more than two months after it purports to have been published — thus beating the electric telegraph all to pieces in announcing new inventions, &c. Will not this become a power incapable of being withstood in our race for priority? As an example: Some one invents a new lens in Vienna, or elsewhere, and it gets described in *The Photographic Journal*, say for the 1st February — it comes here, as a matter of course, as soon as published, and is then published here in March (also of course); but the particulars may appear in a journal whose date is in November, or earlier of the year preceding! The editor claims the invention as his — the true inventor does not hear of it for a long time; but when he does, he points to the date on which *he* first published it, with full confidence of the public verdict being in his favour. Alas! his confidence in your ability to sustain him is sadly misplaced; for does not the advertiser of the *preceding year* contain the very same invention, in the same words, except some few *phono*-typographic alterations, in the peculiar orthography of its editor. The gentleman, professor, or what not, is clearly shown to be an unmitigated plagiarist, by the comparison of dates, which are unanswerable.

Photographic weather would be very acceptable now; but such is still a desideratum, and will most probably be till the equinox is past. ARGUS.

Correspondence.

IRON PRINTING.

To the EDITOR.

SIR,—In the last number of your Journal I notice some remarks in reply to "A Young Beginner," respecting my iron printing process. I think you are in error as to the kind of paper there recommended, for the sensitising solution entirely dissolves animal size, so that practically it is just as well to use blotting paper as any of the English papers. Canson's plain thick paper answers best in my hands.

I do not find the slightest difficulty in getting the half-tones, and the contrast between the darker and lighter parts of the picture need not be more than in a silver print from the same negative. No doubt I shall see you at the Society's meeting to-morrow, and I will then show you one or two specimens that will bear out my assertions. The tone I get by gold is better than that of my silver prints by the old sulphur bath.

If your correspondent will write to me direct, enclosing some of his failures, I will endeavour to set him to rights. — Yours, &c.

Stoke Newington, 4th April, 1859. MICHAEL HANNAFORD.

PRINTING, &c.

To the EDITOR.

SIR,—You must not think that I have altogether forgotten you. I have had a long communication on printing, &c., almost ready for you for the last two or three months, but have now abridged part of it by extracting the formulæ (which are what it appears the Journal readers care most for), appending to them some of the more essential of the observations.

In a letter in your No. 90, alluding to some remarks of mine in your London contemporary, so far was it from my intention on that occasion to accuse Mr. Hannaford of plagiarism—being, of course, quite satisfied with his admission, that he had in his published process been formulising for the benefit of the public what I had previously laid down as a principle—that had it not been necessary to abridge the article alluded to by cutting out part of the matter, *after* it was printed, Mr. Hannaford would have found a sentence to the following effect:—"It is remarkable that among many of my processes or plans which have been adopted, here or abroad, in no one instance, except that of Mr. Hannaford, has their employer or adopter considered it necessary to acknowledge their original source."

My ink process with bichromates and the vegetable salts of ferric oxide, as I mentioned to you in one of many letters (*on it* and the other ink processes) which passed between us several months ago, dates from 1854.—Yours, &c. C. J. BURNETT.

Edinburgh, March 2nd, 1852.

TONING TROUBLES.

To the EDITOR.

SIR,—Of the enclosed picture the part which should be white is very dirty, the defect being caused in the toning bath. I filtered it and had the same result. The toning bath is made with four ounces hyposulphite of soda, four grains gold salt, eight ounces water, and thirty grains nitrate of silver. I have tried Mr. Hardwich's alkaline toning, but not with success. I used to get the whites pure with the old toning formulæ. I do not know whether the annoyance may not be caused by the preparation of the albumenised paper.—Yours, &c.

Lonsdale Square, Islington. ALFRED THOMAS.

[We do not wonder at the condition of your print with such a toning bath as that given. You can never know whether it contains any gold after it has been once used, nor, in fact, what it really does contain. Its toning properties must be due principally, if not entirely, to sulphurisation. Give it up by all means. If you do not manage Hardwich's alkaline toning bath readily, employ that of Mr. F. Maxwell Lyte, which we find equally good, and can be kept ready mixed; but read his instructions carefully, and see also our reply to J. Roberts in the last number, page 88. With regard to albumenised paper, some kinds are very troublesome in the toning bath: we generally find that it is the paper and not the albumen which is in fault, as different papers prepared on the same albumen bath do not always act alike in this matter. As a rule we find thin kinds of foreign paper most liable to the defect of which you complain.—ED.]

CASES FOR PRESERVING SENSITISED PAPER.

To the EDITOR.

SIR,—You seemed interested the other night, at the meeting of the Photographic Society, with the fact of my having, for the last six or seven years, used a case for the keeping of my excited positive paper: I have, consequently, sent the case actually in use during that period for your inspection. At the time I first used it I showed it to poor Horne.

Before my long and severe illness I used to prepare my paper in Montague Street, and take a case full to Cheapside and print as opportunity offered. The simplicity of the affair prevented my "rushing into print" with a "full, true, and particular account" of, &c., but I think it involves the same principle, barring the chloride of calcium, at present in dispute between Messrs. Marion and others.—Yours, &c. P. W. FRY.

14, *Montague Street, Russell Square, 7th April*, 1859.

[We did not receive the above note until after having written the remarks that will be found in our leader, but consider the subject of sufficient interest to record the facts.—ED.]

HARDWICH'S GOLD TONING PROCESS.

To the EDITOR.

SIR,—Having been charmed with the hue of the blacks resulting from Mr. Hardwich's mode of toning by warm solution of gold, with soda and citric acid, I persevered in its use; but, to my mortification, found it gradually losing its effect, until I had only my former red and brick-dust tones.

As the paper and the chemicals were all the same as used at first (except the gold solution, which was freshly prepared every time), I was, for a long time, perfectly nonplussed at my now invariable failure after previous uniform success. Long cogitation only led to the conclusion, that the silver bath on which the paper was sensitised had become acid by frequent use. Test paper speedily confirmed the fact; so I lost no time in correcting this, by the admixture of the oxide of silver, as recommended by Mr. R W. Thomas. The bath now exhibited a slightly alkaline reaction, and upon sensitising anew, to my infinite satisfaction I had no difficulty in arriving at the purple tones for which the process is so peculiar. As many friends have complained of want of success, may it not be traced to a cause thus easy of remedy? I, therefore, advise all who find difficulty in working it, if assured that their paper be good (a perfect *sine qua non*), to examine the condition of their nitrate of silver solution.—Yours, &c.

Liverpool, April 12, 1859. C. COREY.

BOTTLED LIGHT.

To the EDITOR.

SIR,—Every photographic journal that I have seen for some time back has contained some comment on M. Nièpce de St. Victor's experiments with bottled light, and yet none have come to any real conclusion as to whether it is the action of latent light, or the action of the moisture from the water that is introduced into the tube, and the heat that is applied afterwards; for myself I have no time to try the experiment, yet I wish to know if any one has tried a yellow handbill for a negative, as I think some result might be arrived at from this. If from this an impression were obtained, I should conclude at once that the action of latent light had nothing to do with it.—Yours, &c.

April 4th, 1859. A. WHITHAM.

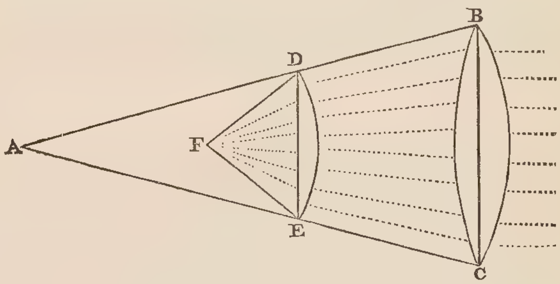
[When a gentlemen of M. Nièpce de St. Victor's standing in the scientific world puts forth a statement, however extraordinary it may at first appear, it is but reasonable to suppose that such *authority* will only be met by *positive evidence*, consequently in commenting upon the presumed discovery of a new quality of light, it is not surprising that the remarks made have been guarded and moderate. We, however, do not concur in the assertion of our correspondent, that *no real conclusion* has been put forth. We point to our last for our own opinion, while no less than two of the remaining three of our contemporaries in this country have also expressed similar sentiments.—ED.]

ON THE ILLUMINATION OF PHOTOGRAPHIC NEGATIVES BY ARTIFICIAL LIGHT.

To the EDITOR.

SIR,—It occurs to me that I can be of some farther use to your correspondent "Veritas," as regards his new difficulty.

1. As to the distance between his condensing lenses. If he draws the triangle A B C below, having the perpendicular B C to the diameter of his larger lens, and the point A at the distance of the focal length of it, then the smaller lens should be placed at such a distance as to make its diameter touch the converging lines as shown.



2. Maintaining this relation of the glasses, if he now exposes the lens B C to the parallel rays of the sun, the focus F (at which he may light a lucifer match) will show the distance from the smaller lens at which he should place his lamp for evening operations.

My own work has been done by the light of a small "fish-tail" gas-burner, and the illumination has, of course, been the least portion of my difficulties.—I am, yours, &c. H. A. S.

Aberdeen, April 2, 1859.

COMBINATION LENSES, &c.

To the EDITOR.

SIR,—Seeing that you are ever ready to afford information on points connected with the practice of photography, I venture to propose the following questions, hoping to receive answers through the medium of your valuable Journal:—

1. Will a portrait combination of lenses take *views* as *well* as an ordinary view lens?

2. Can you say whether or not the front lens of any of ——'s portrait combinations is adapted for taking views, and are the lenses manufactured by him in general very good?

3. Is there any advantage or disadvantage in using a quarter plate camera with a half plate lens?

4. Is there any advantage or disadvantage in using a *stop* between the two *back lenses* of a portrait combination?

By answering the above you will materially assist,

AN AMATEUR.

[1. Yes, if properly applied, but is much more cumbersome.—2. It is intended by the maker for use in that way, and will certainly take

pictures such as they are, but we consider none of his lenses more than second or third rate. You had better get one of a good English maker.—3. A pony would not do well for a chariot, nor a large horse for a pony chaise—though each could possibly draw the respective vehicles; so it is with the lenses.—4. A decided disadvantage.

We have been requested by the agent for the sale of Derogy's lenses to examine and report upon their qualifications. We hope to be able to do so by the time our next number is ready for press. We can state, however, at once, that we have tried the front lens of the combination alone as a landscape lens, and find it quite comes up to all that is claimed for it in this way.—Ed.]

COPYING OIL PAINTINGS, &c.

To the Editor.

Sir,—Your obliging correspondent, Mr. A. M'Nab, in his interesting paper contained in your last number, would, I have no doubt, added much to the obligation he has conferred had he given a few more details relative to difference of time of exposure between plates so coated and when simply coated with collodion, what developer he finds the best, and the time usually required for it, which I should fancy would be considerably longer than usual, but more particularly the advantages to be gained by this extra manipulation over the ordinary wet collodion, with which I conceive the plate is, after it is dry, intended to be coated and sensitised in the usual way.

1. What do you consider the best method to employ for reducing and taking a negative from an oil painting, rather dark in point of colour, namely, the best light to place it in, the kind of lens, collodion, and developer?

2. If any, and what, difference between copy and reducing the above, and a large and dark shaded positive portrait photograph?

3. What do you consider the best kind of reflector to concentrate the rays of a gas light, upon an object three inches square, and where to be procured?

4. Can Mr. Rogerson's apparatus be seen any where in London?

With thanks for former obliging replies.—Yours, &c.

London, April 4th, 1859. QUERIST.

[1. Place the painting in a *strong* light, at right angles to a window, and close to it, then proceed as if taking a portrait, using freshly mixed and sensitive collodion, and develope with an iron solution, and intensifying with gallic acid.—2. To copy of the same size the same position with regard to light will be proper, but the orthographic form of lens will be far better though much slower in action. In this case we prefer to use a syruped collodion film and long exposure: developement as before.—3. A reflector is comparatively useless for this purpose, a condensing apparatus, composed of two lenses, being very superior. See diagram in the present number.—4. We do not know.—Ed.]

COATING GLASS PLATES WITH ALBUMEN.

To the Editor.

Sir,—In the ninety-first number of *The Photographic Journal* is a paper by Mr. M'Nab, on coating glass plates for collodion pictures with albumen, which I have read over several times, but can come to no conclusion as to the meaning of the fourth paragraph of the second column, page eighty, which states that Mr. Young found that by keeping the plates became mouldy and gave foggy results—that a plate kept more than twelvemonths was tried, when the result proved corroborative of Mr. Young's assertion, viz, that it would fog. Being satisfied that this was the case, the plate was taken and a solution of protosulphate of iron was poured on it to coagulate the albumen, and that then, after washing off the iron, the result proved satisfactory.

Now, nothing is said about sensitising the plates, the paper merely speaks of plates *thus prepared*. If they were not sensitised they could not fog, and if they were, Mr. M'Nab can scarcely mean to assert that pouring protosulphate of iron on a foggy picture will clean it; nor can he mean that the iron is poured on the albumen to coagulate it, as it would have been previously covered with collodion, and if capable of being coagulated through that coating, the nitrate bath would have already done it. Perhaps you may be able to give, in a future number, the correct interpretation of Mr. M'Nab's meaning.—Yours, &c. B. JONES.

Cheltenham, 7th April, 1859.

[Mr. M'Nab's paper was upon coating glass plates with a film of albumen *previously* to their being used for taking collodion pictures upon. In mentioning to us the advantages gained thereby he stated, however, that plates prepared for some time beforehand and *stored away*, were apt to become mouldy and thus cause fogging when used to take collodion negatives or positives upon afterwards. We suggested that the mouldiness arose probably from imperfect coagulation: it is very difficult to coagulate *thin* films of albumen by heat, and advised the trial of a solution of protosulphate of iron for the purpose, previously to storing away the plates. It appears that in naming this to a friend, Mr. M'Nab determined to try whether plates that had been stored away without this treatment and had already become mouldy, could be rendered available for use by subsequently submitting them to the action of the iron solution, which was, of course, washed off, and *the plates dried* before pouring on the collodion. The immersion of the plates in the nitrate bath, after the collodion had been poured on, would not obviate fogging, although the albumen became thereby insoluble, because the mouldiness had previously come in contact with the collodion—the object of the iron solution being to *remove the mouldiness* or prevent its formation.—Ed.]

DEROGY'S LENSES.

To the Editor.

Sir,—My attention has just been called to your report of the meeting of the Manchester Photographic Society, contained in your Journal of the 15th March. You say, "Mr. Sidebotham exhibited a large lens by De Rogni," &c. From the description given, there can be no doubt that Derogy is the name intended. Your correction of this error in your next number will much oblige.—Yours, &c.

196, *Strand, London.* LLOYD CHAPMAN, Agent.

ANSWERS TO CORRESPONDENTS.

Mary P***k.—Touch the stain with a little *tincture of iodine* and let it dry, then use a strong solution of cyanide, or iodide of potassium.

J. Stevens.—See reply to "A Devonshire Man" and "Racks." We really cannot give private replies, our labour would never be at an end—as it is we have no sinecure, we assure you.

An Old Subscriber.—It would not be safe to prepare plates by Fothergill's process near a gas light, unless protected by a piece of yellow glass or calico, particularly if wanted to be kept for some time—fogging would probably otherwise ensue.

A Devonshire Man.—Yellow tammy is a woollen material like serge, and is to be had at the *upholsterers'* shops, being used by them for lining curtains, &c. It is more costly than calico, but is much more permanent in colour when exposed to light.

X., Peterborough.—In consequence of a transposition, by the printer, of the *order* of the replies in our last, you were referred to a wrong one. It should have been, "see reply to James Southwell," &c., which, as we wrote them, immediately preceded yours.

J. R.—1. It is best to take a negative direct; but, of course, if you have a positive, and wish to convert it into a negative, it may sometimes be done. 2. Tincture of iodine half a drachm, water one ounce. A good negative should exhibit all the details well *in the shadows*, when viewed by transmitted light: a positive will not do this.

T. Lee.—The yellow spot appears to be due to a small bubble of air having been allowed to remain in contact with the paper while in *one* of the baths, probably in the toning bath, though it may have been in the plain water previously used to wash away the free nitrate of silver. You will find no plan of washing after fixing better than *hanging up*, by means of the wooden clips, each proof for several minutes, between each change of water; it is very little trouble, and very efficacious.

A. F. Eden.—We have not seen the stereographs of Messrs. Ogle and Edge that we are aware of, and consequently are unable to give such hints as you desire. We believe, however, that you may attain a warm brownish-red tone by using paper strongly sized with gelatine, and not allowing the proofs to remain very long in the gold toning bath. Hollingsworth's thick paper and F. Maxwell Lyte's toning bath will most probably enable you to obtain your object.

Racks.—We have frequent inquiries as to the readiest means of providing plate boxes with grooved racks. Messrs. Smith, Beck, & Beck, the celebrated microscope makers, No. 6, Coleman Street, London, having occasion to manufacture racked boxes and drawers, for the conservation of microscopic objects, have constructed machinery for the production of the racks in mahogany. It having been suggested to them that the same sort of racks are adapted to photographic plate-boxes, they have agreed to make them in any sizes that may be required, and they will be supplied to manufacturers of plate-boxes, or amateurs, at a moderate price. These racks are beautifully cut, and it will be a great convenience to photographers to be able to obtain them readily.

Wallis.—Streaks from top to bottom of the negative may arise from one of several causes. For instance, if the plate be removed from the sensitising bath too soon, streaks will form; if it be not properly drained before putting it in the dark frame, the superfluous bath solution will run down in streaks; sometimes, also, streaks form when the developing solution is poured off carelessly—the plate should be rocked a little when performing this operation. We presume you are speaking of portraits; if so, your bath may be too acid; but *intensity* is as much dependent upon developement as upon exposure. An iron developer is very apt to be deficient in giving strength. The best remedy is to use a pyrogallic acid solution subsequently. If, after attention to the preceding, it still is deficient, we think your collodion must be in fault. Try some other kind.

*** We give in this number two additional pages of matter, notwithstanding which, several articles in type are crushed out by a press of matter of more immediate interest. Among the articles left over is an important one on Mr. Lloyd's "Dry Process," which shall appear in our next.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 93, Vol. VI.—MAY 1, 1859.

On the evening following the day on which our last issue was published, the 15th ultimo, we had the pleasure of assisting (as our French neighbours phrase it) at one of the most brilliant and successful soirées of the season, where photography formed the *pièce de resistance* of the intellectual part of the entertainment, with a garnish of microscopes, gyroscopes, electro-motive engines, and other philosophical apparatus by way of side dishes.

The gathering took place at the Mansion House, in consequence of invitations from the Right Honourable the Lord Mayor and the Lady Mayoress to some of our most noted photographers, together with many distinguished members of the scientific world and private friends of the entertainers, including a goodly array of the fair sex, to meet the President (Mr. Glaisher, the celebrated meteorologist) and other officers and members of the Blackheath Photographic Society, Mr. T. Wire, the son of the Lord Mayor, being one of the Secretaries.

Judging from the animated conversation which was carried on in every direction, the pleased and eager countenances that met the eye wherever turned, and the frequent expressions of admiration and satisfaction which fell upon the ear, the entertainment provided must have been highly gratifying to every one concerned.

The number of photographs exhibited was considerable and, what is more important, of high character; in fact, many of them have before been fully noticed in these pages, consequently it will be sufficient to mention the names of the artists to indicate the class of productions.

There were contributions from Francis Bedford, M. Claudet, P. H. Delamotte, Roger Fenton, Frank Frith, Melhuish, Alfred Rosling, B. B. Turner, Williams, &c., &c., in addition to many others, chiefly members of the Blackheath Society, amongst which we recognised with pleasure some subjects taken by Mr. Wire in his trip through Kent, described in a paper published in our last volume, entitled "A Week with the Camera among the Kentish Hills," in which that gentleman sung the praises of a "dog-cart" as a *photographic* vehicle; to the justice of which praises the photographs bear ample testimony, particularly those taken at Chiddingstone, a locality apparently abounding in the picturesque.

Mr. Glaisher exhibited some highly interesting photographs from drawings of *snow crystals*, presenting very many varieties of form, as observed by him a winter or two back, when a copious fall of snow took place, in such condition as was most favourable for a microscopical investigation into the subject; the flakes not being composed of agglomerated masses, but consisting generally of regularly formed feathery crystals, perfectly symmetrical, and of great beauty,

Surrounding the collection of photographs contributed by the members of the Blackheath Society, was a beautiful series of large-sized ones representing the fronds &c., of various ferns; these, besides being of an out-of-the-way character, were further distinguished as the production of a lady follower of our art, Mrs. Glaisher.

The method of execution was by simple interposition of the actual frond itself upon a sheet of sensitised waxed-paper, which, after sufficient exposure, was developed and fixed in the usual way. This afterwards acted as a negative, from which the positives exhibited were printed, and thus a faithful *fac-simile* produced, displaying all the beauties of venation, fructification, &c.

Botanists and Naturalists generally, as might be anticipated, prefer these illustrations to all others taken by any process hitherto devised. It will be at once perceived that this is a most valuable application of photography, and one that may be followed by the many without any expensive apparatus.

The Rev. A. B. Cotton's picture of Sinai, from two negatives on waxed-paper, we notice as very effective for the particular subject delineated; indeed the waxed-paper process, in skilful hands, not unfrequently rivals collodion—for instance, some of Mr. B. B. Turner's works are such as to leave little to be desired.

We were much struck by some small pictures of Mr. Heisch's, viz., a red and a white camellia, with the bright green leaves, in a hand basket, colours most trying to the photographer to reconcile, but which under Mr. Heisch's treatment were successfully interpreted in simple light and shade. This be it remembered is no slight praise—no engraver can do more in this respect; while, as regards truthfulness of form and minutiæ of detail, of course the photographer beats the engraver hollow. There were several examples from the same subject exhibited, illustrative of Mr. Heisch's researches upon the value of employing iodides, bromides, and chlorides in something like atomic proportion; the views entertained by him being fully set forth in a paper published in our last volume. Certainly the most perfect is the proof from the negative prepared with four parts of iodide, two of bromide, and one of chloride, as a sensitising mixture.

Mr. Claudet's contribution comprised many large-sized photographic portraits coloured in oils.

Herr Pretsch displayed some of his photogalvanographic plates, together with the impressions therefrom.

M. Rejlander had a small pair of his very suggestive *morceaux*, which we believe he calls "The Two Children," the subject being taken from an old Norse legend:—

> 1st. Thus they played for hours together,
> And the dog went fast asleep.
> 2nd. So they both would sleep together,
> But the dog then watch would keep.

In both pictures the group consists of an aged grandsire, the little grandson, and the dog. In the first, the *two* children, (that is, first and second childhood) are playing at "cat's-cradle,"

the old man's countenance expressive of kindly and eager interest and lit up with a beaming smile,—the dog snugly sleeping at their feet.

In the other, the two playfellows are locked in one another's arms and having a quiet doze after their game, while the dog *wide* awake keeps a vigilant look out. The complete repose of the muscles is the point especially aimed at, and this is beautifully exemplified in the child's hand, which is particularly expressive of sleep.

And the dog! — what a famous dog he must be! — we fancy we have made his acquaintance before accompanying his master with a *camera turned into a wheelbarrow!*

Of course stereoscopes and stereoscopic subjects formed a very attractive feature in the entertainment.

As novelties in the latter branch, we have to mention a series of twenty-five, recently published by Messrs. Negretti and Zambra, of scenes and individuals of note in China, which are particularly interesting, and exhibit characteristics differing materially from the ordinary class of stereoscopic illustrations. We believe they are the productions of a photographer sent out specially by the publishers for the purpose of procuring them.

Messrs. Horne and Thornthwaite exhibited the illustrations of the moon, and also the beautiful sea-view, noticed in another column as the work of Mr. S. Fry, together with two others of a similar description to the last-named, representing the calm and the ground-swell.

Messrs. Smith and Beck were intrusted with the magnificent stereographs of the moon belonging to Mr. Warren De la Rue, enlarged by the late Mr. Robert Howlett to about twelve inches in diameter, from negatives taken by Mr. De la Rue. These were shown in the large reflecting prismatic stereoscope constructed purposely for their display, and are truly wonderful productions. Smaller copies of the ordinary stereoscopic size were also shown by the same gentlemen in their well-known achromatic stereoscopes.

Among the stereoscopic luxuries were some pillar arrangements for showing in succession a series of subjects. In one, which we believe is called "Stereoscopia," twenty or thirty paper slides are attached by their backs to endless tapes, passing over a square piece of wood, revolving on an axis upon the principle of the Jacquard loom. This arrangement does not admit of the display of transparencies.

In another a series of drawers, containing about fifty slides each, placed in racks, are so contrived that the whole, amounting to some hundreds as a total, can be viewed in succession by simply working a handle. This we believe is the result of American ingenuity; it is, we must admit, a little complicated, and rather puzzling to work correctly at first. Like the preceding, also, it is only adapted for opaque slides.

Another form, manufactured by Messrs. Negretti and Zambra, is contrived to be employed with transparencies, and this in a very ingenious manner, occupying but small space, the twenty-five Chinese views before alluded to being all mounted in one instrument. It is difficult, without the aid of diagrams, to give an idea of the method of arrangement; some notion of it may however be formed, by imagining the slides to be all arranged like the spokes of a wheel around a cylinder, but with a sort of hinge so contrived that all except the one under inspection bend out of the way.

A magnificent collection of first-class microscopes, by Powell and Lealand, Ross, Smith and Beck, and others, attracted very general admiration.

Of photographic apparatus there was a goodly display, comprising every possible necessary convenience and luxury that a photographer could desire; in fact, if any objection could have been made to such a collection, it could only have arisen from *un embarras de richesse*. Cameras of every possible (we had almost added and impossible) form—rigid and folding, portable, square, long, massive, &c., &c. — together with the thousand and one contrivances for changing plates in the field — lenses, dishes, plate-boxes, tripods, plate-holders, baths, dark slides, *cum multis aliis*.

Amongst Messrs. Horne and Thornthwaite's collection we noticed a new bellows camera, with diagonal brass stays to insure rigidity, and Powell's box stereoscopic camera.

Messrs. Burfield and Rouch had their new dark operating chamber for large plates (a developement of their registered box), in which one or two unsual essentials to comfort were apparent, viz., elbow room, and ventilation. They also exhibited a new portable camera that has some advantages.

Messrs. Murray and Heath brought out several interesting novelties in the apparatus department: in the first place there was a small deal plate box for a dozen glasses, so arranged that they rest on slips of india rubber, and are placed in V shaped racks, other slips of india rubber being fitted into the lid to prevent any vibration during transport from place to place. At the bottom of the box is a little drawer, just under the cross pieces of india rubber; this drawer being for the reception of waste blotting paper to absorb the drainings from the plates which may be put in while wet. By removing the drawer, and leaving open the lid, a free current of air passes to dry the plates. To some of these boxes, for work in the field, an additional partition is added to carry the chemicals, and the whole is thus as snug and compact as it is possible for such a thing to be. Some folding racks for draining wet plates are also natty contrivances, the principle being the same as adopted in those made by Mr. Francis—the novelty is their folding. Another well-contrived affair was a glass water-tight bath in a mahogany case, the lid being of ground-glass, and kept tight by means of a spring underneath and a vulcanized rubber pad between it and the wooden part of the lid, which also was so contrived as to be removeable without being actually separated. It is extremely simple and effective, and a matter of very great convenience to a travelling photographer, while equally efficient in the operating room.

We have been thus diffuse upon the various kinds of apparatus, because we find that our country friends especially are always eager for information relative to new and useful appliances in the mechanical department, as is indeed natural from the greater difficulty experienced by them in obtaining a sight of such matters. We therefore endeavour as much as lies in our power to make use of our eyes upon all occasions for their particular benefit, and take a note of all that strikes us as worthy of comment.

While on the subject of mechanical conveniences we may mention that we have been contriving a new folding tripod that is extremely firm and handy to use, also an effective and economical swinging back for cameras, both of which we purpose describing shortly.

PALMAM QUI MERUIT FERAT.

In our last Number, at p. 91, we published a paper read by Mr. Sidebotham at the last meeting of the Manchester Photographic Society on Micro-photography, in which that gentleman claims for Mr. Dancer the honour of having been the originator of these very minute productions.

Although we noticed the remarks made while the article was still only in manuscript, we preferred publishing the paper without comment at the time, intending in the present to make a few observations upon the statements made, not by way of detraction from Mr. Dancer's merit, but in justification of our own assertions. The production of very small photographs is so obvious a possibility as to suggest itself to many photographers without its even calling forth a remark; and, having produced them, those possessed of a microscope would as naturally examine them by its aid. We know many who did so. But this is not the point at issue.

We have ourself laid claim to having *originated* the idea of producing photographs specially *as microscopic objects*, and for

examination only by aid of the microscope, as indeed is a necessity, for they cannot be distinguished without.

The very word "micro-photograph" *we* also coined to describe them, upon the occasion of our supplying Messrs. Smith and Beck, the noted microscope makers, of Coleman Street, with some which they desired to have for sale. We find an entry made in our pocket book at the time, dated March 29th, 1854, when we furnished them with twenty-four specimens. A few of these we had exhibited some weeks previously, at the house of our friend, Mr. A. Rosling, the Treasurer of the Photographic Society, and subsequently, at the meeting of that Society on 6th April, 1854, we publicly exhibited them, as will be found recorded in the *Journal of the Photographic Society*, Vol. i., p. 194, and published on the 21st of the same month.

The dimensions of these portraits and landscapes ranged from the $\frac{1}{40}$ to the $\frac{1}{20}$ of an inch square, that is the *one-sixteen hundredth* to the *four hundredth* part of a superficial *inch*, one of them being a pretty extensive view of Paris.

Now we assert most emphatically that we never saw, or even heard of, anything of the kind having been produced, prior to our conceiving the idea and practically working it out in the early part of the month of March, 1854, nor have we ever, until we saw Mr. Sidebotham's paper the other day, heard it alleged that micro-photographs had been in existence prior to the time named.

Moreover about *twelve months subsequently* to the date quoted, Mr. Thornthwaite, to whom we had previously shown our specimens, at a soirée, at Mr. Woodward's, laid before us a copy of the monumental tablet of Sturgeon, which he alleged to have procured the production of *in consequence of what we had shown him*, and asked our opinion of its merits; to which we replied, that it was good, but the scale upon which it was taken was not comparable with those we had done, it being *very* much larger in dimension. At that time we had never heard of Mr. Dancer's name to our knowledge.

The lens employed by us was an achromatic microscopic object glass of $\frac{2}{3}$ of an inch equivalent focus, manufactured by Messrs. Smith and Beck, and the negative was placed at a distance of about three feet from it.

It may be remarked by our readers that we are making a fuss about a trifling matter, as micro-photographs can never be more than amusing curiosities; but it is a matter of some importance to us — no less than a charge against our integrity — imputing to us an attempt to claim the credit due to the ingenuity of another.

Such a charge against us appears to be involved in the article by Mr. Sidebotham, especially in the concluding paragraph; and to remain silent upon the subject would be tantamount to admitting its justice.

We do not suppose that Mr. Sidebotham or Mr. Dancer would either of them imagine that we would willingly be guilty of such turpitude; but the paper read by the former, in which it is stated that Mr. Dancer gave him some micro-photographs early in the year 1853, necessitates the inference that we had unfairly claimed credit for the latter's suggestion, unless some explanation of the discrepancy be given.

If then Mr. Dancer really did produce what are called micro-photographs at that time (1853), it was at an earlier date than our own, which was in March, 1854, as above stated; and we shall certainly be sorry should it turn out to be the fact.

We do not by this remark mean for one moment to call in question Mr. Sidebotham's veracity, but simply to request him to refer with care to his dates; and if it be found that Mr. Dancer preceded us, we shall of course withdraw our claim to having been the *first* to produce them, although we cannot concede the point of our having worked it out independently, and without any knowledge whatever of its having been done before. We purpose sending a copy of this article to Mr. Sidebotham, with a request that he will communicate it to the Manchester Photographic Society.

NOTICE OF RECENTLY PUBLISHED STEREOGRAPHS.

In our last we had occasion to bestow commendation upon some highly deserving specimens of stereographs on paper; we have now to direct attention to some printed on glass, the work of Mr. Samuel Fry, of Brighton, which are quite out of the ordinary class of these productions.

The application of photography, aided by the stereoscope, to the visible demonstration of the fact that the earth's satellite is uncontestably of a globular form, is one of more importance than at first sight appears to be the case. It is true that, by strict logical reasoning, the fact had been deduced; but, until the phenomenon had been actually brought home by the evidence of sight, the conviction thereof rested rather upon circumstantial than direct evidence; consequently, the production of photographic stereographs of the moon's surface may be regarded as the *experimentum crucis.* We believe, that to our friend, Mr. Warren de la Rue, belongs the honour of having first accomplished this feat; and, thanks to the subsequent aid of the late Mr. Robert Howlett, the public have been supplied with many copies from Mr. de la Rue's negatives.

As might have been predicted, an object of such beauty, and possessing besides so much of scientific interest, became naturally very much in demand, and several other photographers were fired with the ambition of producing equally valuable results; amongst them Mr. Samuel Fry has been eminently successful.

To those who are unacquainted with the principles of binocular vision, there will not be any thing surprising in the power of showing visibly that the moon really and truly is of a globular form, and more or less studded all over with mountainous protuberances; because they are ignorant that, in order to exhibit this, it is necessary that the pictures be taken from *two distinct points of view;* while to the unassisted eye, or by aid of a telescope, the moon's surface appears as a flat disk, but with certain parts darker than others.

Now although the inhabitants of this earth never see but one and the same side of the moon, it is a fact that owing to the relative rates of her orbital and axial motion, a small portion of her surface on opposite sides of the hemisphere next the earth are alternately rendered visible — the movement being regular and periodical, and known as the moon's *libration.* Advantage is taken of this slight change of position to procure the impressions from the requisite points of view, for of course it is immaterial whether the camera is shifted or the object itself is made to turn slightly on its axis.

In order to show the effect of an entire globe it has been thought advisable to take the moon's portrait when at the full, but in so doing it must be borne in mind that the irregularity of the surface is in a great measure lost to the eye, because the effect is precisely similar to that which occurs when we take a landscape with the sun shining directly behind our backs—we lose all the beautiful relief of shadows. It is true that by taking the impression when presenting a gibbous phase, the effect of the shadows is retained, but then a portion only of the globe is visible. Mr. Fry, being anxious to retain the advantages of both of these conditions, has in his stereographs combined a full disk with a very gibbous one, in opposite states of vibration, and the effect produced is both striking and beautiful; and though we should, if we had the choice, prefer *three* sets of illustrations, viz., those of the waxing, full, and waning moons, yet for a single one the arrangement adopted is perhaps the most satisfactory.

Accompanying the stereograph is a small pamphlet with an illustrative diagram of the moon, which imparts a fund of information, together with the names and supposed character of the more important elevations and depressions of the surface. The little pamphlet materially enhances the value and interest of the slide which it explains.

Scarcely inferior in interest to the preceding is an instantaneous picture of the sea, showing the effects of a stiff south-west breeze, in which every ripple is distinctly visible, with the white foam cresting the breaking waves, and more than all, the brilliant play of light upon the dancing spray.

We have no hesitation in pronouncing the beautiful specimen before us more satisfactory than anything of the kind that we have hitherto seen. The perfectly liquid appearance of the water, the transparency of the spray, the four vessels towards the horizon, and the graceful curl of the wave, together with the general brilliancy of the whole, unite to bring vividly before the mind the

pleasurable sensation of the bracing effects of inhaling the sea breezes. In fact one never wearies of looking at this specimen, and while viewing it we almost fancy we hear the rush of the surging waters and smell their briny savour.

We strongly advise those having stereoscopes to indulge in the luxury of a mental visit to the sea-side.

MR. F. G. LLOYD'S DRY PROCESS.

Mr. Alfred Keene having made his first appearance this season in your April 1st number, and published (for I dare not say "positively the last" time) his mode of manipulation in Fothergill's process, I beg to call your attention to, in my opinion, a much simpler and more efficacious method of proceeding, by which quite as good results are obtainable, with less trouble, considerably less exposure, and a less protracted developement. This improved process is the invention of Mr. F. Giesler Lloyd, of Belsize, Hampstead, and it so completely supersedes the troublesome manipulation usually prescribed in Fothergill's, that I suppose that no one who has tried it once will go back to the other.

Albumen — prepare thus: To each ounce of albumen add an ounce of water and three minims of liquor ammoniæ. Beat up in the usual way, allow to settle, and filter through sponge. Preserve in a stoppered bottle with camphor. For use, one ounce is diluted with nineteen ounces of water, to make up a pint.

After removing the plate from the nitrate bath drain for half a minute, rest the plate on blotting paper, and wipe the back dry. Place it in a *well-bath*, containing two ounces of the dilute albumen, and lower the bath suddenly to cover the surface of the plate at once. Move the bath, so that the albumen may flow backwards and forwards for about two minutes, or until the albumen wash becomes milky and does not get more so; then pour it off, supply its place with water, and agitate: pour off the water, take out the plate with a silver hook, and wash it well under a tap; finally, rinse with distilled water and set up to dry. When surface dry, place the plate before a red fire, or complete the drying over a spirit lamp.

Exposure — The time is short, the plates being very sensitive.

Develope with pyrogallic acid and citric acid, one and a-half grains of the former and three-fourths of a grain of the latter to the ounce of water. Neither alcohol nor acetic acid are necessary.

First wash the plate in distilled water and place on a levelling-stand. To every two drachms of developing solution add three drops of a thirty-grain solution of nitrate of silver. After moving the solution over the plate two or three times, let it remain still until all the details appear; then pour off, and add nitrate of silver until sufficient intensity has been obtained.

Should the developer become much decomposed, mix a fresh quantity with more nitrate.

Fix with cyanide of potassium, five or six grains to the ounce.

Such is this process, simple, easy, and intelligible, and I recommend a trial of it to all those of your readers who wish to obtain excellent results with the least amount of trouble.

Although I have not yet tried developing with protosulphate of iron and citric acid, as detailed in your last number, page 78, I think it applicable to the above process, and that it would reduce the time of exposure by one-third. The solution given by you seems to me rather too strong, and I would recommend trial of a weaker one, say ten grains protosulphate of iron, and three-quarters of a grain of citric acid to the ounce of water. Two drachms of this and two drops of nitrate of silver solution would be sufficient for a stereoscopic plate.

Preliminary Coating — Allow me to thank Mr. MacNab for his interesting paper (supra, p. 80) on the coating of glass plates with albumen, prior to using them for the wet process. They will be found equally useful for every dry process in which collodion is employed. I am glad to see that the importance of this method is beginning to be recognised. It was first announced by the Rev. W. Law, of Marston, near Rugby, in two letters addressed by him to the *Journal of the Photographic Society*, October, 1854, and was almost simultaneously, in the autumn of that year, put into practice by Mr. R. Barnes, and subsequently detailed in his pamphlet on the "Dry Collodion Process." Those who have seen what can be done with both wet and dry collodion on albumenised plates, in Mr. Barnes's hands, may be well satisfied with such results.

A paper has recently been published by Mr. Nevile, which may be termed a modification of Mr. Barnes's process for dry plates. He simply coats the plates with a mixture of half albumen and half water, and dries them; but I should prefer Mr. MacNab's formula. Mr. Nevile uses an old collodion with a rotten film in preference to a newer one, and sensitises in the ordinary nitrate bath, letting the plate remain double the usual time. After taking it out he washes it for half a minute in a bath of water made slightly acid with citric acid; this has the same effect as sensitising in an aceto-nitrate bath. The plate is then set up to dry, and the drying may be completed by artificial heat. After exposure the plate is again put into the citric acid water to moisten the film, and is developed with a solution of pyrogallic and citric acids and a few drops of silver, in the way indicated above. The developement is not longer than with wet collodion. Wash and fix with hyposulphite of soda. The plates by this method are not easily spoiled by over-exposure. If they are to be exposed in one or two days after preparation no preservative solution need be used, but if the plates are required to be kept for some time before exposure, give them a coating of dilute albumen, and drain off before they are dried.

I think it of importance to direct the attention of your readers to these two processes, as they are both closely related, and I shall be happy to find that they will not only be practised but improved upon. If Mr. Barnes would give us the benefit of his experience in the latter mode of operating, I am sure I shall not be the only person who will thank him for imparting information on a subject which he has made peculiarly his own, as he was unquestionably an independent inventor of the dry collodion process on albumenised plates, and the first to point out the necessity of employing a collodion giving a structureless film for the dry process

AN AMATEUR.

SILVER PRINTING PROCESSES,

Including Salting, Sensitising, Toning, Fixing, and Testing Baths.

By C. J. Burnett.

(Continued from page 90.)

No. 9*.

Hydrofluoric-ammonio-nitrate bath made on the same principle as those already described, but by adding *hydrofluoric acid* or fluoride of ammonium* (or potassium) to an ammonio-nitrate bath.

No. 10.

Fluo-nitrate of silver bath, formed by adding fluoride of ammonium (of potasium or of sodium) to a neutral nitrate of silver bath. This bath is specially intended for sensitising paper salted according to formulæ 2, 3, 4, 8, 9, 10, and allied formulæ.†

No. 11.

Benzoate of silver being to a considerable extent soluble, we may form a neutral benzoic-nitrate bath by adding benzoate of *soda* (or of ammonia) to a neutral nitrate of silver bath.‡ Intended for salting chloride, chloro-bromide, and pure bromide-salted papers. This bath should also be tried with albumenised papers.

Nos. 12, 13, 14, 15, 16, 17.

An ammonio-nitrate bath, with the addition of, in the first instance, a small quantity of hydrofluoric acid or fluoride, and then (12) benzoic acid (or a benzoate) to saturation, and similar, but with (13) citric, (14) formic, (15) oxalic, (16) succinic, (17) tartaric, or other acid instead of benzoic.

Nos. 18, 19, 20.

Baths, by adding (18) benzoate of soda (or ammonia), or (19) formiate, or of (20) malate soda to a neutral nitrate bath, along with fluoride of ammonium or potassium.

N.B.—Should any one ask me which of all the various formulæ yet published I would recommend for one who has not leisure for trying, or does not care about trying, a variety of processes, but wishes to set to work with *one* thoroughly good and reliable-on

* Hydrofluoric acid, unless very dilute, must be cautiously handled. The bi-fluoride of ammonium is a convenient salt.

N.B.—All baths or solutions containing *fluorides* or hydrofluoric acid should be used *only in gutta percha vessels.* Can a neglect of this precaution have any thing to do with the discrepancies of opinion, as to advantages of the introduction of fluorides in negative processes?

† Though I have got good pictures from papers containing fluorides, I do not yet undertake to pronounce whether there is any thing of importance gained by their use in printing, but give *these* sensitising baths (*i.e.*, 9 and 10 and 12-20) containing them merely to show what I believe to be, on principle, the best way of introducing them, if they are to be used.

N.B.—I have not yet been able to get the fluorides to *take the place* of chlorides, bromides, or iodides (fluorine seeming, at least in this combination, much less readily allotropisable than its allies?). Had it been capable of replacing them, the fluorides of silver being very easily *soluble*, we might have been able to simplify our operations by dispensing altogether with separate salting bath, and the fixing without hyposulphite would also have been *greatly* expedited.

‡ The citrate tartrate, &c., and other salts which are nearly insoluble in water (even more than the benzoate), being yet soluble to some extent in a nitrate bath, might be also introduced in this same way; also the malates and formiates.

process, I think I might venture to reply,—Take chloro-bromide paper,* salted by my formula A, No. 1, or else, according to tone, &c. wished, common chloride of ammonium or sodium salted paper,† and sensitise it with a bath prepared according to my sensitising formulæ B, No. 1 or 2, by the addition of *citric* or benzoic acid to the old ammonio-nitrate bath (or you may neutralise partly with each acid). You will then have a paper which will give you *fully* as good results, as to tone and adequate representation of the negative, as any now in use, and which, especially when prepared with citric acid, keeps much better in the sensitive condition than the old ammonio-nitrate papers will do. You have all, and I think more than all, the advantages, as to the results obtained, of the old ammonio-nitrate paper, without the liability to discoloration which has stood so much in the way of its more extended use. Those, however, who prefer the old plain neutral nitrate bath, should try it on papers salted according to salting formulæ A, 2, 3, 8 (or some of the others containing salts of vegetable acids). Benzoate and citrate of soda (or tartrate of ammonia) together, instead of either of the two alone, answer very well in mixture along with the chloride (or chloro-bromide). The mixtures of these vegetable salts I would recommend for use in albumenising papers for those who must have albumenised papers, though for my own part, except for stereoscopic prints, I, as a general rule, dislike albumen.

Photographers will take note that the materials I have *specially* recommended are all quite accessible.‡ Benzoic acid is obtainable at any chemist's shop, and should not cost more than 1s. 6d. per ounce; benzoate of soda can either be purchased or easily made from the acid; citrate of soda is purchasable or easily made; tartrate of ammonia easily made, or Rochelle salt purchasable at 1d. per ounce; also that oxalate of ammonia is cheaply purchasable; formiate of soda and succinic acid, or succinate of ammonia, are to be got at some of the principal chemical shops; fluorides of potassium and hydrofluoric acid ditto; malic, racemic, and meconic acids are occasionally to be met with; fumaric acid and its salts must be made, and I have not yet got them tried in the *pure* state.

(To be continued.)

POSITIVE PRINTING.—PRESERVATION OF SENSITISED PAPER.

The researches of Messrs. Davanne and Girard have now extended to the causes of the discolouration of sensitised paper, and to the means of effectually obviating them. Paper prepared with nitrate of silver, it is well known, will not keep many hours; it becomes discoloured and of a *scorched* appearance, while it loses its sensitiveness, and becomes altogether unfit for producing good positives. This deterioration takes place within a period of time that varies with the state of the weather and with the quality of the paper: it is most rapid in a warm moist atmosphere, but proceeds much more slowly in one that is cold and dry. Papers prepared by other methods, as with the chromates for example, do not undergo this deterioration; but the employment of paper prepared with the chromates would upset all our present *modus operandi*, while the proofs obtained would be vastly inferior to those yielded by nitrate of silver.

In tracing the cause of this deterioration in sensitised paper, we must remember that the surface is formed by the mixture of two very distinct bodies, insoluble chloride of silver, and soluble nitrate of silver in great excess, which remains on the surface in a free state—they are both indispensable to the obtaining of a good proof, with all the half tones and relief so much coveted by artistic photographers. Upon examination, it was found that the free nitrate is the cause of the discolouration of the paper; for upon taking a sheet of silvered paper and dividing it in two parts, and washing one to remove all the free nitrate, so that nothing remained on the paper but the insoluble chloride, this portion underwent no alteration when kept in the dark, while the other portion became rapidly discoloured, and at the expiration of three or four days was quite unfit for use. This preservative power of chloride of silver is permanent, whatever may be the quantity in the paper.

It would therefore be easy to prepare a silvered paper, that could be kept in good condition for a long time, by simply freeing it from the excess of nitrate of silver, but in that case the paper would be unfit for photographic purposes. The deterioration of positive paper in the dark is evidently due to the action of the free nitrate of silver upon the organic substance of the paper: this deterioration may be promoted by secondary causes, such as great concentration of the nitrate, or the prolonging of the time the paper is allowed to float on the silver solution, or as the sizing may have a greater or lesser tendency to combine with the nitrate of silver; every experiment however tends to prove, that the free nitrate is the sole cause of the discolouration of the sensitive paper.

It has been observed by every one, that sensitised paper becomes darker on the back than on the face, which may be easily explained, from the fact, that on the surface of the paper the free nitrate is mixed with chloride of silver, which takes no part in producing the deterioration, while the back is charged with free nitrate, which penetrates by capillary attraction.

The mode of manufacturing the paper, and the nature of its sizing, have also an influence on the deterioration of the sensitised paper. English papers, strongly sized with gelatine, undergo less change than papers of continental make, amongst which those that contain the least sizing, are the most subject to change. The more sizing there is in the paper, the less nitrate is absorbed by capillary attraction. This fact induces the belief, that the salts of alumina, which possess the property of inducing impermeability in tissues, may, when judiciously employed, communicate to photographic paper a conservative property. This is proved by experiment. Positive papers salted with chloride of sodium, to which one per cent. of alum is added, preserve their integrity much longer than when prepared in the usual manner.

In seeking to discover the law governing the alteration of sensitised paper, and taking as a guide the changes in ozonized paper when exposed to humidity, we may conclude that moisture plays a very important part in the alteration sensitised papers undergo. When prepared paper is kept in a state of absolute dryness, it retains for an indefinite time all its original value and properties. Pieces of positive paper of the most diverse kind have been suspended, in the dark, in jars hermetically sealed, containing hygrometric substances, such as chloride of calcium, carbonate of potass, &c.; at the expiration of three months the paper had undergone no alteration, not the slightest discolouration was apparent, while the other portions of the same papers, kept in portfolios, were stained. Thus it appears that when sensitised paper is preserved in a completely dry state, in an atmosphere also quite dry, it undergoes no deterioration, but is at the end of three months as fit for use as at first.

Boxes may be easily constructed in which this condition is fulfilled. At the bottom is placed the hygrometric substance, covered with a frame fitting tightly, upon which a piece of fine linen is strained; above, but not in contact with the linen, the sensitised papers may be kept. The top of the cover may be lined with some yielding substance, into which the interior of the box should press tightly, so as to preclude the admission of air.

ON PRINTING GLASS TRANSPARENCIES.

By T. H. Nevill and James Dorrington.

[Read at the Meeting of the Manchester Photographic Society, by Mr. Dorrington.]

(Concluded from page 192.)

These earlier suggestions appear, however, to have been nearly overlooked, for they have never been extensively employed by either amateurs or professionals, so far as is known. In his first experiment with the albumen, prior to applying the collodion, Mr. Nevill carried out Mr. George Nevile's suggestions literally, washing the plates in water slightly acidulated with citric acid. The result, however, was a failure, so far as the picture was concerned; but the tenacity of the film was found perfect, and thus one great difficulty was in a fair way of being overcome.

The next experiments were made by combining certain parts of Mr. George Nevile's process with our old favourite—the raspberry syrup. The plates were first coated with albumen; then, after being dried, were covered with collodion in the usual way, and after sensitising were treated exactly according to the formula framed by Mr. Sisson, for the raspberry syrup. From plates so

* Paper salted with bromide alone also deserves a trial. I have got not bad results on it when sensitised with these baths. A bromide and benzoate salted paper, sensitised with nitrate of silver, also gives good proofs.

† Marion's or Canson's salted, as sold, gives capital tones.

‡ I might have varied the manufacture of some of the sensitising baths, had I not been so anxious to attend to this, *e.g* by., recommending the pure solutions of citrate, benzoate, succinate, and other allied salts of silver in ammonia, and discarding the nitrate altogether. I might also have recommended the double salts, generally freely soluble and easily crystallisable, (and which might readily be prepared for sale in crystals, if in demand) which are formed by their vegetable acids in combination with ammonia and silver-oxide together. Both these classes of baths will yield good prints, and are highly deserving of the photographer's attention; though with the exception, perhaps, of the acetate and carbonate, not generally articles of commerce, the organic acid salts are in most cases so readily obtainable by double decomposition and precipitation in the case of sparingly soluble ones, as tartrate and citrate, or by solution of carbonate or oxide of silver in the acid in the case of more soluble ones, that there is, even now, not much of an obstacle in the photographers way.

prepared the result was at times most satisfactory, as will seem by the specimens now upon the table, numbered 1, 2, 3, and 4.

But it was found that there was very frequently a tendency to become dirty in the developement, as exhibited in pictures No. 5 and 6, for which no satisfactory reason could be found, for this tendency was very irregular. In the most carefully prepared plates, the dirty deposit sometimes made its appearance immediately on the application of the developing solution, and at other times only about the time that the developement was on the point of completion. In every case, being within the film, it was irremovable, as exemplified in No. 5 plate, where an attempt was made to remove it.

It was at this stage of his later experiments—the earlier ones of which he had already made known to me, from time to time, as they were being carried on—that Mr. Nevill showed me what results he had obtained, and asked me if I could suggest any means of removing the difficulty he had met with. My first idea was that the dirt was owing to the use of common water, not distilled, and I repeated his experiments, carefully preparing the plates with distilled water. The result was the same. It then occurred to me to try gelatine in the place of albumen; and, accordingly, I prepared some gelatine from the formula given by Dr. Hill Norris, in December, 1856, through the *Journal of the Photographic Society*. On trying the first plates so prepared I was delighted with the result:—it was entirely successful with each of two plates so prepared, whilst several other combinations which I had made at the same time were defective in one respect or other, and were at once abandoned.

The Process now Employed.

Having been applied to by many parties for the details of the process, which has evidently not been fully understood, as may be gathered from paragraphs in the various journals, I now proceed to give them, at the risk of rendering this paper unduly long, and of the repetition being thought tedious:—

First, then, to prepare the gelatine, take

Nelson's Patent Gelatine	60 grains.
Distilled water	7 ounces.
Alcohol	1 ounce.

Soak the gelatine in about one ounce of the water, then dissolve it completely by heat. When dissolved, and nearly cool, add the remaining six ounces of water, and the alcohol; also a small quantity (half a teaspoonful, or less, is sufficient) of albumen, that has been beaten up. Heat the whole to boiling temperature, before which the spirit causes the albumen to coagulate. Allow it to settle in a warm place, after which filter carefully. When properly prepared, the gelatine solution is perfectly bright and clear.

With this, whilst warm, coat the plates as with collodion, taking care to effect this by once pouring on and off. Dry by rearing on one corner. If the plates are a little damp, they are the more easily coated. A large quantity of plates may be gelatined at a time, and so kept till wanted for use.

Before coating with collodion, warm the plates at the fire, so as to ensure the surface of the gelatine being quite dry; and when cool, proceed as with the ordinary collodion process, and sensitise in a neutral bath. I use thirty-five grains of nitrate of silver to the ounce of water. Any good collodion, positive or negative, seems to answer; but the plates on the table are mostly taken with Keene's collodion, as prepared for Fothergill's process. A very old collodion, in some cases, gives an opalescent film, which it is as well to avoid, although it disappears when varnished. Collodions prepared with resin are still more objectionable in the same respect.

The plate, on removal from the bath, is passed into a dish of distilled water, and left there until another plate is ready to take its place, when it is passed into a second dish of water, and afterwards to a third, by which time it has received the necessary amount of washing.

It is then transferred into a dish containing the raspberry syrup, diluted with six times its bulk of water, in which dish it remains until the fifth plate is ready to be taken from the bath.

When taken out of the syrup dish, the plates should be placed in one corner, and left to dry naturally, in a dark room of course.

The Printing.

Before using these plates it is perhaps as well to warm them slightly at a dull fire, so as to prevent any chance of the film adhering to the negative, although I have seldom found this necessary in practice; for, whilst the back of the plate, unless cleaned, is often very tacky, the syrup on the collodion side seems generally to get almost entirely absorbed into the film, especially after the plates have been prepared for a few days.

After printing I first moisten the surface with water, and then develope with a solution—

Pyrogallic acid	2 grains,
Glac. acetic acid	20 minims,
Water	1 ounce,

to which a little alcohol may be added if preferred. Theoretically, perhaps, no alcohol should be used; but I find, by experience, that the developing solution flows more readily when a small quantity of alcohol is added. To one and a-half or two drachms of this add three or four grains of a solution of nitrate of silver, forty grains to the ounce of water, and pour this on and off over the moistened plate. The silver should always be added to the developing solution before the latter is poured over the plate. In a few minutes the picture makes its appearance, and the developement may be carried on, generally with the same solution, until sufficient intensity is obtained. Fix with cyanide of potassium, or with hyposulphite of soda. Wash well, and dry. If there should be any deposit of dirt, which in this process can only arise from careless developement, or from a bath being out of order, it will be found to be merely on the surface, and can readily be removed entirely, by again wetting the plate, and rubbing it whilst under the tap with cotton wool or with the finger. It is, however, imperative that the plate be well dried before attempting the cleaning away of dirty deposit after, or during the course of, developement, otherwise the film will rub off; although, after drying, it will bear any reasonable amount of rubbing.

It is not necessary to varnish these pictures before mounting. They are not in any way improved by a varnish, which often, in fact, brings only defects, from spots of dust or uneven flow.

It will be seen, from this paper, that we advance NO claims to any new discovery. We have simply followed out and combined ideas previously published; and before attaining a process sufficiently successful to be worthy of communication to this society, have patiently worked our way with partial successes, but far more numerous failures, the trouble of which others who may be disposed to follow in our steps may now be saved. We shall feel amply repaid for our own pains and labour if the process which I have now detailed prove as successful in the hands of others as it now almost invariably does in our own; and we are glad to be in some measure able to reciprocate, by this communication, the many useful hints and suggestions that we have from time to time received from our fellow-members in particular, as also from the generally free communications of our brother photographers at large—an easy, simple, and expeditious method of printing glass transparencies having long been a desideratum.

PRODUCTS RESULTING FROM THE ACTION OF BROMINE AND CHLORINE UPON WOOD SPIRIT.

By M. S. Cloez.

I. When bromine is gradually added to pure methylated alcohol, an energetic reaction takes place, accompanied with a considerable elevation of temperature. The wood-spirit employed in this operation must be put into a tubulated retort, and the bromine introduced through a long tube reaching to the bottom.

The acid vapours resulting from the reaction pass over into a tubular receiver surrounded with ice; one portion of the vapours condense into a liquid acid, containing unaltered wood-spirit and hydrobromic methyl-ether in solution; the rest passes into the atmosphere in the state of hydrobromic ether, mingled with a very irritating volatile substance which excites tears.

About ten or twelve parts of bromine are employed for one part by weight of wood-spirit; when the reaction is complete, the liquid in the retort separates into two portions: the lightest is acid, being a saturated aqueous solution of hydrobromic acid; the other, more dense, constitutes the principal product of the operation; it is an oily liquid, of an amber colour, which soon becomes a solid mass formed of colourless crystals, when exposed to the air after many washings with distilled water.

The crystals formed remain impregnated with the volatile irritating substance already mentioned. They are purified by being pressed between bibulous paper, so as to completely remove the liquid that soils them; they are next treated with warm absolute alcohol: the filtered solution deposits, upon cooling, colourless prismatic crystals, similar to those of nitrate of potassa.

The centesimal composition of this product is the same as that of bromal, resulting from the action of bromine upon the ordinary alcohol; but as all its physical properties are different, it must be designated by a special name; that which at the same time ex-

presses the written formula of the body and its chemical function, is —*parabromalide.*

The formula $C^4 H Br^3 O^2$, or one of its multiples, represents the composition of parabromalide; it is deduced from several analyses made upon products obtained at various operations.

The following equation shows that parabromalide produced from bromine and wood-spirit arises simply from an elemination of water and hydrobromic acid:—

$$2 (C^2 H^4 O^2) + 8 Br = C^4 H Br^3 O^2 + 2 HO + 5 H Br.$$

The density of parabromalide is 3·107; it melts at 67° C.; when distilled, it is decomposed. At about 200° C. it decomposes into bromine and hydrobromic acid; elevation of temperature destroys it completely, forming a mass of carbon in the retort. It is completely insoluble in water; its best solvent is concentrated alcohol; chloroform dissolves a large quantity; it is decomposed by a dilute aqueous solution of potash into formiate and bromoform, in the same manner as its isomeric body bromal.

Cold alcoholic-ammonia solution acts upon parabromalide nearly like potash; but when the operation is conducted in closed tubes, at a temperature of 100° C., the reaction is more complex; for, besides formiate of ammonia, we find in the liquor the products resulting from the action of alcoholic ammonia upon bromoform, and a brown powder remains in suspension, which appears to be impure cyanhydrine.

II. The action of chlorine upon wood-spirit has been studied by several chemists. In examining this subject anew, I have ascertained that chlorine acts in exactly the same manner as bromine: the principal product of the reaction is a body isomeric with chloral—*parachloralide;* it separates from the water, and gives out much hydrochloric acid, mingled with chloride of methyl. The wood-spirit subjected to chlorine must be in the greatest possible state of purity, and absolutely anhydrous, obtained by repeated rectification upon powdered quick-lime.

The chlorine is immediately absorbed by methylated alcohol; the action is sometimes so energetic as to occasion explosions. It is necessary to operate in diffused light: at first the apparatus must be properly cooled; but towards the end of the operation the retort must be warmed, so as to distil the product in a current of chlorine.

The oily liquid saturated with chlorine is mixed with its volume of concentrated sulphuric acid. After twenty-four hours it is distilled upon massicot in a current of dried carbonic acid.

Parachloralide is a liquid similar to chloral; its density is 1·5765 at 14° C. It boils at 182° C., and distils almost without residue. It has a suffocating odour, similar to that of perchloroformic ether; its insolubility in water permits of its being perfectly distinguished from chloral, from which it also differs in its boiling point being almost double. With the fixed alcalis and alcoholic ammonia it behaves exactly like parabromalide.

The formula of parachloralide ($C^4 H Cl^3 O^2$) probably represents only two volumes of vapour; so it is with the formula of parabromalide, which, if the hypothesis be true, must be doubled. This is a point to be investigated. The determination of the density of the vapour of parachloralide, made at the temperature of 265° C., has given but very unsatisfactory results; for the liquid in the receiver undergoes alteration in becoming coloured and producing a little hydrochloric acid gas.

Between chloral and parachloralide, and between bromal and parabromalide, there must exist the same relation as between ordinary aldehyde and its isomeric modifications, paraldehyde, metaldehyde, and etaldehyde; unfortunately, the equivalent of these products has not been definitely ascertained, and we cannot derive any conclusions from these relations that will establish the equivalent of the two new bodies described above.

COLLODION FROM CELLULOSE.

By M. D. Van Monckhoven.

The discovery of M. Schweitzer, recently detailed in this Journal (page 80), of a new solvent for cellulose, has excited much interest among photographers, in the hope that a new collodion would be obtained, in which cellulose would replace gun-cotton. The experiments of an eminent scientific photographer, M. Van Monckhoven, lead us to hope that this desirable result is arrived at. He dissolved recently-precipitated oxide of silver in the cupro-ammoniacal solution of cellulose, and spreading the liquid on a glass plate, put it when dry into dilute hydriodic or hydrobromic acid. A white layer of iodide or bromide of silver is formed, but it was impossible to obtain a clear and transparent image upon it. A continuous layer of reduced silver is formed beneath the layer of cellulose, and the superficial image is lost. The same results attended the employment of the ammoniacal deuto-bromide of copper (2 Cu. Br, 5 N H^3) and the ammoniacal iodide 2 (N H^2), Cu. I, 3 H O, a brown veil of metallic silver always formed beneath the image. These results are named to warn others against undertaking useless experiments.

The methods that succeeded are as follows:—

The ammoniacal solution of deutoxide of copper is prepared either by saturating concentrated ammonia by oxide of copper recently prepared, or in employing the method of M. Pelygot, which is much the simplest.* When the solid impurities are quite settled, dissolve cotton in the liquid in the proportion of eighty-five grains to the pint. A thick liquid results, which is gradually diluted with water, until all the cotton is dissolved. Then a concentrated solution of iodide of potassium is added, so that thirty five ounces of the solution of oxide of cupro-ammonium will contain from seventy-five to one hundred-and-fifty grains of iodide. It is this mixture with which the glass plates are coated.

All the beauty of the proof will depend upon the preparation of the cupro-ammoniacal liquor, which must be thick, so that it flows slowly over the glass plate, and it must be quite transparent when dry. If the fluid is too thin the image will be superficial, without intensity, and will be washed away under a stream of water.

The ammoniacal solution, when poured on the glass, should spread itself evenly; it evaporates slowly; when the excess of the liquid is drained off, the plate is set against the wall. Two modes of operating next present themselves.

1st. After the plate has been allowed to evaporate a few minutes only, the coating becomes opaline, and an excess of liquid falls to the lower edge of the glass, which must be removed by a piece of tissue paper; the plate is then immersed in the nitrate of silver bath, to which recently-precipitated acetate of silver and acetic acid are added. The coating becomes white, as in the usual method, by the iodide of silver formed; it is then exposed in the camera, and afterwards developed as in the ordinary process.

2nd. If, on the other hand, the plate is allowed to become quite dry, the ammonia being quite eliminated by evaporation, the ordinary reaction of alkaline iodides upon the salts of the deutoxide of copper takes place; that is, protiodide of copper (Cu. I) is formed in the layer of cellulose, and iodine on the surface. Such a plate becomes red when dry. Plunged in the nitrate of silver bath, it yields a superficial picture, which the slightest washing removes, and metallic silver is formed under the image, through the presence of proto-iodide of copper. But as this method will be preferred by photographers on account of its simplicity, a remedy for its inconveniences may be found by passing the plate into a bath of anhydrous alcohol, into which a current of dry ammoniacal gas has been driven. The free iodine is transformed into iodide of ammonium, and aldehyde is formed:—

$$2 I + 2 NH^3 + C^4 H^6 O^2 = 2 NH^4 I + C^4 H^4 O^2$$

The plate becomes white after an immersion of a few seconds. On removing it from the bath, it must be agitated in the air, so as to remove the excess of ammonia by evaporation; then plunged, humid as it is, into the nitrate of silver bath; afterwards proceed as in the ordinary method. In this way may be obtained proofs of very fine quality, transparent, and free from spots.

It is certain that cellulose may supersede gun-cotton in collodion, to the great gain to photography in simplicity, economy, and excellent results.

ON THE UTILIZATION OF NITRATE OF SILVER BATH.

It is frequently desirable to make use of old nitrate of silver baths, by concentrating them to a suitable strength for positive printing; but they are seldom found available without some special treatment. One method, suggested by Mr. Eliot, is as follows:— Evaporate the bath solution till it is of the strength of fifty or sixty grains to the ounce; then add citric acid, in solution, of any strength, until precipitation ceases; then add ammonia, until the reddened litmus is restored to its proper colour; filter, and afterwards add nitric acid, two drops to the pint. When the citric acid is first added, a precipitate is formed, which ceases after a small amount has been added, and is not increased by further addition of acid. The solution, when filtered, furnishes rich purple tones to paper floated upon it, when the gold bath is very active; if it is not so, there is great difficulty in subduing the red colour imparted by the free citric acid. When *aqua ammonia* is added, to effect neutralization, a further precipitation of a light flocculent deposit

* By digesting copper *turnings* in a measured quantity of strong ammonia.

takes place, which appears to fill the bottle, but, when filtered out, is very little. The papers now floated upon the solution, print and tone to a dense neutral black, and take the gold readily. When two drops of nitric acid are added to the solution, it works as well as can be wished. The precipitates appear to be, in the first instance, iodide of silver—in the second, citrate of silver.

ON A MODIFICATION OF THE META-GELATINE PROCESS.

By D. W. Hill.

[Read at the Meeting of the North London Photographic Association, April 27, 1859.]

Not having been as successful as I could wish in preparing *large* plates by Fothergill's process, I have, for some time, used a modification of Maxwell Lyte's meta-gelatine, which I prepare as follows:

Soak one-and-a-half ounces of Nelson's gelatine in eleven ounces of distilled water for a few hours; then boil till dissolved, stirring constantly; then add two drachms of sulphuric acid in two ounces of distilled water, and boil gently for a quarter of an hour—allow it to get cold (I leave it all night); then boil again for a quarter of an hour, and neutralise the acid with powdered chalk; filter while hot; add one ounce alcohol, and make up the whole quantity to eighteen ounces—filter till quite clear.

Some prefer adding the white of an egg to the solution before diluting it, and boiling till it coagulates, when it runs through the filter like water.

After sensitising the plate, dip it in a gutta percha bath, containing moderately pure drinking (new river) water, till the water runs evenly over it; drain, and wipe the back with sponge; then pour on the meta-gelatine along the upper edge, and let it flow in an even wave over the plate—let half run off into the waste dish, and pour the remainder into the measure for the second application; then, with some kind of water, wash it off thoroughly *à la Fothergill*, and dry the plates before a fire. I find the picture developes more evenly, and is much less liable to stain. I have used it for 12×10 inch plates. The exposure with Ross's 9×7 inch lens, ⅜-inch stop, seven or eight minutes. With ½-inch stop, developing with iron, two minutes. I use the residues of all sorts of collodion, which has been accumulating for years.

I prefer bringing out the picture with iron, and finishing with pyrogallic and citric acids.

By using old collodion for cleaning the glass and polishing *thoroughly*, I never get a blister, and the plate will bear any amount of washing, though it is a good idea to cover the mouth of the tap with muslin, which prevents the water coming with too much force.

The method of making the meta-gelatine is nearly the same as M. Lyte's first formula; but he recommended the addition of honey and water, which, I think, only increases the risk of failure.

We extract the following, at the instigation of an esteemed correspondent, who thinks well of the hints thrown out, although some of the assertions made do not at all square with our own opinions. We are always, however, glad to let *both* sides of the question be examined by our readers, conceiving that it is the only way of arriving at sound conclusions:—

ADAPTATION OF THE DEVELOPING.

The strength of the bath is all the time changing, and the developing that will work well to-day may not work at all to-morrow. If you cannot procure satisfactory delineations, weaken the developer with water until they suit you. I adapt my developing every day or two, and can tell in an instant what change need be made. Make your collodion and bath by the formulæ, and then dont tamper with them, as any desired result may be produced by changing the strength of the developing. Too strong developing destroys the delineations, too weak gives smutty lights.

After being in use some weeks there will be an accumulation of alcohol in the bath when this collodion is used, so that the developer will not flow over it and develope the negative evenly. This "crawling" of the developer can only be remedied by evaporating the alcohol from the bath; it can be done by placing the solution in a strong open-mouthed bottle: place the bottle in an iron or earthen vessel containing water, and heat it gradually until the alcohol is evaporated. This operation is attended with some little trouble, but after becoming accustomed to it, I find this process has many advantages, which repay more than ten times over this one drawback on its practicability. The alcohol can be evaporated after the day's work, and the bath will be ready for use in the morning, after filtering. Alcohol should never be used in developing, as it precipitates the iron out of the solution, and is the cause of many of the holes in the skies so generally complained of.—*From an Article in "Humphrey's Journal" (American), by F. B. Gage.*

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual meeting of this Association was held on Wednesday last, the 27th ultimo, at the Myddleton Hall. George Shadbolt, Vice-President, occupied the Chair.

The minutes of the last meeting were read and confirmed.

Mr. Barber exhibited some excellent photographs of scenes at Shanklin, Bonchurch, Ventnor, &c., in the Isle of Wight, the negatives having been taken by the oxymel process.

Mr. Fox, of Little Britain, was elected a member of the Society.

Mr. Hill read a paper upon *A Modification of Mr. Maxwell Lyte's Meta-gelatine Process*, an abstract of which will be found at page 110.

A vote of thanks was awarded to Mr. Hill.

Mr. Barber suggested the use of oxalic acid instead of sulphuric acid for making the gelatine, on the ground that oxalate of lime is absolutely insoluble.

Mr. Hill stated that he dried the plates before the kitchen fire (of course with the room darkened) without any detriment to the sensitiveness of the plate, not only drying them after they have become surface-dry, but also as soon as all flowing moisture had ceased.

The Vice-President drew attention to the use of hot bricks for the purpose, as had been recommended by Mr. Keene for Fothergill's plates.

Mr. Barnett exhibited a plate showing the effect of unequal drying by heat in producing stains, and considered that as a drawback to artificial drying.

Dr. Riley exhibited some negatives by his modification of the collodio-albumen process, as published in a former number of this Journal.

Dr. Riley considered that Fothergill's process is not so certain or simple as that he employs. He stated that he believed the true theory of the sensitiveness of his plates consisted in the altered structural condition of the collodion film by coagulation, and not from any compound being formed with silver. He asserted that a collodion film being sensitised and *thoroughly* washed from free nitrate of silver, coated with albumen, and again washed thoroughly while wet, and subsequently immersed in boiling water to coagulate the albumen—it dries in about a minute after removal from the water—and if then exposed in the camera, it is highly sensitive to the action of the light.

The Chairman suggested the possibility (if Dr. Riley's theory were sound) of coagulating the albumen by means of a sulphate of iron bath, and suggested that some of the members should try this plan before the next meeting, as well as Dr. Riley's of coagulation by hot water.

It was proposed by Mr. Hannaford, and agreed to, that this discussion be continued at the next meeting, and that dry processes generally be taken into consideration.

Mr. Hannaford mentioned that he had obtained instantaneous pictures upon dry plates, and also others with an exposure of a few seconds of time, but that he was not in a sufficiently forward condition with his experiments to communicate his results. He mentioned, however the following facts:—After taking the plates from the sensitising bath, and slightly washing them, they are dipped into a bath of solution of citrate or acetate of soda (other allied salts will of course suggest themselves), by which proceeding all the free nitrate becomes converted into citrate acetate, or other cognate salt of silver. It now becomes advisable to pour over it some preservative solution (say albumen by Fothergill's method), but pictures have been taken by him without any preservative solution on dry plates. On a plate six hours after preparation he had taken an instantaneous stereoscopic negative.

The Chairman, in reply to a statement of Dr. Riley's as to his belief that no dependence could be placed upon plates prepared by Fothergill's method, remarked that he had been quite successful with plates $9\frac{1}{2} + 7\frac{1}{2}$ inches, with several kinds of collodion.

Mr. Dawson, Mr. Hill, Mr. Morley, Mr. Hislop, Mr. Dalton, Mr. Barber, and others, took part in the discussion.

The subject of Mr. Young's (Manchester) discovery of the possibility of fixing plates before developement was then alluded to, and the Vice-President mentioned that he had within the last few days tested the point, and found a camera exposed plate developed perfectly after removal of the iodide by hyposulphite of soda.

Mr. HUGHES mentioned some interesting facts, ascertained by his experience, relative to the comparative rapidity of impressionability of plates when developed by iron solutions or by pyrogallic acid, as also the effect of bromides and chlorides in the sensitising solutions. He stated that with good collodion freshly *iodised*, and bath in good condition, and good light, the exposure required with either developer he found *the same*. If, however, the temperature were low, the light poor, the collodion old, or the bath acid, the *iron solutions* had decidedly the advantage. The addition of *bromides* he found to require an *increased* exposure (to nearly thrice as long) when pyrogallic acid developers were employed, but not any longer with iron. Chlorides required a little more time with the iron, but with pyrogallic greatly retarded the effect.

Votes of thanks were accorded to Dr. Riley and Mr. Hughes for their respective communications, and the meeting separated.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE Annual Meeting of this Society was held on the 13th ultimo. Mr. HOOPER, in the absence of both the President and Vice-President, was called to the Chair.

The SECRETARY read the minutes of the last meeting, which were confirmed.

Mr. JAMES HODGSON was appointed Auditor, to examine the Treasurer's accounts for the past year.

The Annual Report was then read.

REPORT.

The retiring Council, in conformity with the rule which requires them to lay before the Annual Meeting a summary of the proceedings of the Association, beg to lay their Report before the members.

Twelve meetings have been held during the past year, the proceedings at which are as follows:—

April 14—Election of Officers; Annual Report read; Discussion on the cause of the separation of the Collodion Film from the Glass in the Aceto-nitrate Bath.

May 12—Mr. WARDLEY: Paper "*On Waxed Paper Process.*"

June 9—Mr. HEYWOOD: Paper "*On Taupenot's Process.*"

July 14—Discussion on Mr. Wardley's Paper.

August 14—Discussion on the proper Exposure to Light of Sensitive Surfaces under peculiar circumstances; Mr. LEECH and Mr. DEANE: Communications on Levelling Stands.

Sept. 8—Mr. HEYWOOD: Paper "*On Fothergill's Process*;" Mr. DEANE: Communication on the Preparation of a highly Albumenised Paper.

Oct. 13—Discussion on Mr. Heywood's Paper.

Nov. 10—Discussion, introduced by Mr. Hooper, on Photoglyphs and several other subjects.

Dec. 9—Dr. ROSCOE, the President: Paper "*On the Measurement of the Chemical Action of Light*;" Mr. HOOPER: Communication on Carbon Printing; Mr. HEYWOOD: Communication on Alkaline Chloride of Gold Toning.

Jan. 12—Discussion on Printing and Alkaline Gold Toning; a circular Moveable Diaphragm was exhibited by Mr. HOPE; Discussion on Washing Prints, Dark Slides for Dry Plates from milled-boards, and Developement of Pictures in Daylight.

Feb. 9—Mr. HOOPER communicated a Self-acting Method of Washing Prints.

March 9—Mr. ROGERSON: Paper "*On Enlarging Photographic Pictures*;" and Nomination of Officers for the ensuing year.

The Treasurer's accounts are on the table, and have been found correct by Mr. Hodgson, who has been appointed auditor. They show that the Society has funds to meet all its engagements, and a balance of £1 15s. 3d.

Your council regrets being compelled to announce a falling off in the numbers of the members of the Association, but sees no reason to doubt the ultimate usefulness of the Society. Any person who has had much to do with public societies understands the case. The ardent photographer gathers around him many kindred spirits, and success crowns their united efforts; but many who have joined from curiosity fall away in the first or second year, leaving only those who can assist each other; and the Council believes that the Society consists now of more practical working photographers than it ever has done before.

If members wish the Society to progress, they must second the efforts of the Council by canvassing for new members amongst *photographers*.

The attendance at the meetings in July and August being small, owing to several causes, the Council suggests that Rule 9 be altered to discontinue the meetings in those months. The punctuality of opening and closing the meetings has been discussed in the Council, and it recommends that the business commence at eight o'clock precisely, and close at half-past nine. The irregularity into which the Society has fallen in this respect of late is a serious inconvenience to those members residing at a distance.

The Council believes that increased interest would be given to the meetings by a short summary of the most interesting news relating to photography; it would furnish abundant material for discussion and experiment; and it is happy in being able to announce that a member, whose services to photography are well appreciated, not only in, but beyond the circle of this Society, will perform that duty.

It was moved and seconded that the Report now read be received, approved, and adopted, which was carried unanimously.

It was moved and seconded that the best thanks of this meeting be given to the President, Vice-President, Treasurer, Secretary, and Council for their services during the past year, which was carried unanimously.

The votes for Officers were taken by ballot. Two gentlemen were appointed scrutineers, who found—

Professor Roscoe was elected *President:* Mr. Nicholson, *Vice-President*; Mr. Heywood, *Secretary;* Mr. Hooper, *Treasurer;* and Messrs. Meredith, Rogerson, Wardley, Whaite, Thelwall, and Fawcett, *Council.*

Mr. HOOPER then read a summary of intelligence from the photographic publications.

Mr. WARDLEY exhibited a box for storing sensitive papers, which he believed was as good as any now in the market; any tinman could make one. The only point to be guarded against was admission of the atmosphere; and a perforated box, containing chloride of calcium to absorb any moisture therein, should be placed inside with the papers.

In reply to an inquiry as to the cause of the creasing and running up of the albumen on collodion after fixing in hypo', Mr. WARDLEY stated that some samples of hypo' act so, but that he found it corrected by adding a few drops of acetic acid to the fixing bath.

Nine gentlemen were elected as members.

It was moved and seconded that the words "except the months July and August" be added to Rule 9.

The thanks of the meeting were then given to the Chairman, which concluded the business.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held on Tuesday evening last, the 26th ultimo. Mr. HOWELL, one of the Vice-presidents, occupied the chair.

There being no paper to be read, various matters connected with photography were discussed. First came the point started by Mr. Johnstone at the previous meeting, as to the best mode of preparing French paper, so as to free it from the inferior sizing to which it was subjected. The process was again described in terms similar to those already reported in this Journal.

Mr. OSBORN mentioned that, some time ago, when working the calotype process in Suffolk, he met with a continuous succession of failures; up to a certain point the negative came up well, but then it gradually went brown all over.

Mr. JOHNSTONE said this might arise from more than one cause. If there was a small excess of nitrate of silver in the iodised paper, or an excess of iodide of potassium left in it, it would brown; and this would also be the result if it were under-exposed, and a developer with an under proportion of acid were used.

Mr. OSBORN: These were tried in every possible way—long exposure and short exposure; but all browned in the developing.

Mr. JOHNSTONE: After you have washed the paper by the double wash, if it gets the slightest gleam of light it will be good for nothing: you would not discover it till after you have developed.

Mr. OSBORN: Do you mean to say that iodised paper always ought to be kept in the dark?

Mr. JOHNSTONE: Yes, while it is being prepared. You should not prepare a paper by strong candle light unless there is a yellow shade.

Mr. OSBORN: Many people, in using single wash, coat the paper in an ordinary lighted room.

Mr. JOHNSTONE: In single wash you do not run any risk, because the nitrate is entirely neutralised by the excess of iodide.

Some conversation next took place regarding the various photographic agents, Mr. JOHNSTONE stating that fourteen years ago he used iron for this purpose. His first experiment was with some sulphate of iron which had been made eighteen months. He took

a piece of paper, washed it with nitrate of silver, dried it, put a small lithograph in contact with it, put glass over it, and held it in the sun till he had counted a hundred. He then took a little of the sulphate of iron, poured it into a flat dish, immersed the paper, and in five or six seconds a tolerably fair negative was developed. The next experiment, being with a new solution, did not answer. The sulphate first used had no doubt become peroxydised to a considerable extent, so that there was acid which kept the pictures clean.

The subject of Nièpce's "bottled up light" was next introduced by Mr. JOHNSTONE, who asked whether any gentleman had made experiments?

Mr. BOURNE said he had done so, but had signally failed.

Mr. JOHNSTONE said he had tried similar experiments as M. Nièpce, but had come to different conclusions. What M. Nièpce said was in reality no conclusion. He said the light was absorbed and was given out after a time, but, unfortunately for the notion, the same results could be produced in two different ways without the action of light at all. Both electricity and heat could produce them.

Mr. OSBORN said one singular thing was that this "bottled light" would not pass through glass. If it was really a bottled light one would think it would pass as well through a glass negative as through paper, just as with heat.

Mr. JOHNSTONE said Daguerre asserted that electricity was the great exciting cause in photography, but he never showed the mode of action. He (Mr. J.) hoped, in a short time, to be able to explain how chemical action arose and was carried on.

After conversing about the best form of tent, &c., the meeting adjourned.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

INTRODUCTION.

COLORED photographs occupy an undeservedly questionable situation: the artist curls his lip at them, and the photographer regards them with a sneer. The one says they are no paintings, the other that they are no photographs; thus the art of photographic coloring, unrecognised by either, must seek consolation in the fact that it is embraced none the less eagerly by both. At exhibitions of paintings colored photographs are peremptorily refused, and it is very frequently advised that they should not be received for photographic exhibitions. The truth is that an artistically painted photograph combines the best and highest qualities of both photography and art:—the camera providing truthfulness of light, shade, and resemblance; the painter adding those beauties and effects from which all pictures derive their greatest value. A mere likeness is valuable during the life of its possessor, but cannot outlive the love or respect of the friend or relative who may chance to own it; while a genuine work of art "will preserve the remembrance of the homeliest woman and the poorest individual, when every trace of the most beautiful female or the most august sovereign have been swept by time from the memory of man." If the beautiful and the true are united, their productions surely claim the very highest standard of worth, surpassing all those which are merely true or merely beautiful.

Let the scientific man of the camera and the studious son of the pallette, then, throw aside all their childish jealousies, and combine their efforts for the production of works valuable both for fidelity to nature and artistic merit.

"Unity is strength," and the truthful can have no better mate than the beautiful.

The best interests of photography are served by advocating its union with art, in demanding for it a much higher standard of worth than it can ever claim as a simple mechanical acquirement, calling for no greater intellectual effort than that implied by carefulness and manipulatory skill.

Photography should stand as high in the domain of art as it does in that of science, and its professors should consider the principles and theories of great painters as legitimate a branch of their study as optics and chemistry.

The photographer who has mastered the philosophical principles of his art knows the difficulties he meets with in combatting its imperfections. The effect of form is dependent upon light and shade, but, independent of this, colors having in themselves photogenic power produce in the photograph both lights and shadows, thus effecting a positive alteration of more or less consequence in form itself.

Of no less importance are objections arising from the imperfect nature of our optical arrangements, such as the distortion of advancing and receding objects, without referring to others demanding a more complicated and detailed description.

This being the case the advantages of an educated eye must be apparent to every photographer, as he may otherwise overlook upon the focussing glass of his camera remediable errors, and perpetuate them in his photograph to the injury both of himself and his art.

In the next chapter, I shall venture to suggest some of the more prominent principles of pictorial effect in connection with photographic portraiture, and in conducting my instructions to a close, I shall always so endeavour to combine the practical and theoretical, that the *how* may be safely founded upon the *why*, hoping to beget that habit of thoughtfulness in the student without which there is little chance of ultimate success.

Permit me to remark, that no department of the fine arts possesses greater claims to feminine attention than photographic coloring, the demand for its professors is fast increasing, and colored photographic portraiture bids fair to outstrip all its rivals, many of my pupils have been ladies, some of whom are now well known as accomplished and meritorious colorists.

If in the course of these chapters any of my readers should find passages at all imperfect or obscure (which as I have no pretensions as an author is probable), I shall very willingly answer any questions they may please to ask, or give any further information they may think necessary for successful progress.

(To be continued.)

Letters to a Young Photographer.

No. IX.

MY DEAR EUSEBIUS,

Do I remember your grandmother? That dear delightful old lady, to whom we paid a flying visit on our way to the Lakes? When I forget her, may my right hand forget its cunning. Is she not as fair and prim as a maiden of eighteen? is not her voice as melodious as the note of the blackbird? and is not her face radiant with smiles, such a one as only a Raphael could paint? Shall I forget her whipt syllabubs—her strawberries and cream, and those tea-cakes, which refreshed us, after our dusty journey, like manna in the wilderness, while seated in the jessamine arbour? No, never! Should I like to see a portrait of her? Aye, indeed; should I not? Would I not frame it, and place it in the post of honour in my studio, as a trophy of your skill in photography, and as the picture of a model woman. It is an honour to your head and heart to devote the first essay of your skill to the obtaining her fair counterfeit; and you cannot fail to triumph over all difficulties, if you but exercise your skill with due patience and deliberation.

How shall you take her? I would have her seated in the jessamine arbour, with that quaint old-fashioned tea-service before her, which she boasts was the property of *her* grandmother. I would place Fido at her feet, and the favourite cat on the opposite seat—there will be a picture, which will gain you a prize and "honourable mention" at the next Exhibition. I think, if you plant your camera under the great walnut tree, you will find the jessamine arbour and its contents to come nicely into a $8\frac{1}{2} + 6\frac{1}{2}$ plate. Be very particular in focussing. When the image appears on the ground-glass, if it be indistinct, you must move the screen first backwards, and if the indistinctness increases, then bring the screen nearer to the lens, until you are satisfied with the sharpness and brilliancy of the picture. Many operators think it necessary to employ a "focussing glass," and I dare say they find their account in it; for my own part, I can do without one.

Now comes the crisis! You are about to take a picture! and you feel—don't you—as you did when you first pulled the trigger of that confounded old blunderbuss, that kicked and knocked you over last Guy Fawkes' day. Never fear, your camera won't kick, although it may capsize some windy day, and cause you to find your level prone on mother earth.

Now, I suppose you have a collodioned plate all ready in the dark slide. You place the cap on the lens, withdraw the focussing screen, and put the collodion slide in its place, having coaxed dear old granny to "sit quite still for just half a second." She does her best, but not being used to pose to artists she soon forgets the injunction, and just as you place your finger on the trigger (I mean the cap) she enters into confidential intercourse with Tabby, nodding her head and smiling all over her face. You pause, this will never do! You do not wish her to look like a Chinese mandarin, and so wait

till the sentimental fit is over, and mildly repeat your warning gently insinuating that "the operation is going on;" to which she promptly replies—"Yes, I know. I feel it going all over me like a cold chill!" You argue—it is nothing, it will soon be over, and with this assurance a mesmeric influence is established, and you get sufficient time to remove the cap, and, lo! the picture is taken.

Of course the dear old lady wants to see how she looks, and coaxes you to open the slide, as she has to go to see about dinner and cannot wait. You expostulate, and urge that nothing can be seen of the picture until after it is "developed." She urges: "she is not particular, she had rather not, it will do as it is," but your remonstrances prevail, and you make good your retreat to your dark room.

I cannot give you any precise instructions as to the time of exposure which will secure a good picture; there are many things to be taken into consideration which I will briefly enumerate. First, there is the power of the lens, dependent on its length of focus, and on the principles upon which the "objectif" is constructed; secondly, there is the degree of illumination of the object, and its tone of colour; and lastly, there is the sensitiveness of the collodion, to be taken into account. Now, it is impossible you can work by fixed rules amid these variable controlling influences. An inch or two of difference in the focus of a lens will effect a second or two difference in the time of exposure, other things remaining the same. As a general rule, the shorter the focus the quicker the picture is taken. As the collodion is affected in proportion to the amount of light reflected from a given object this latter must, of course, always form a variable quantity in operating with the same lens; and this again is governed by the quality of the collodion employed, some being much more sensitive than others. Therefore, if two of your elements of operating are constant, you may, by one experiment, arrive quickly at a knowledge of the unknown quantity of the third. For example, you first wish to ascertain if you are working with a quick lens or a slow. To establish this rigorously you experiment with the same collodion, upon the same object, the camera at the same distance from it, and at the same hour of the day, when the amount of illumination is identically, or nearly, the same. If you move your camera, or change your collodion, or repeat your experiment in the afternoon instead of the morning, you will not be able to tell which influences the result, whether it be distance, light, or collodion; and in this state of confusion, your lens, which you think are testing, is—nowhere.

Suppose you wish to test a sample of collodion, you must change only this one element of the operation; the camera, the distance, and the amount of light must be fixed elements. You will know by the result whether your picture has been over-exposed or under; if the latter there is no remedy for it, but do not give way to the weakness so many photographers indulge in—that of seeking to obtain pictures in less than no time. In the majority of such abortions all the qualities that constitute a really good picture are absent. There are no half-tones; the shadows are dry and opaque instead of being clear and transparent; the lights look abrupt and glaring, as if they had run away from the shadows; there is, in fact, a total absence of what painters call breadth, and a want of harmony of tone, which places such productions out of the pale of art altogether. Yet you will see such things held up for admiration, on the sole plea of having been taken in nineteen-twentieths of a second. Much better is it to take fifteen or twenty seconds, if they be required to obtain a good picture. Why, when I first began to take Daguerreotype portraits, my sitters thought themselves lucky if they could get off with a five minutes' pose; a pretty severe trial this for fixed attention. As soon as the cap was removed, I used to sit down and read a chapter in the last new novel while the operation was going on, and generally managed to get through it before I considered my picture *done;* but, as the French say, *nous avons changé tout cela.*

Photographic Glossary.

Iodates—Salts formed by the union of iodic acid with bases. They generally resemble the chlorates.

Iodate of Potassa—A salt obtained by the action of iodine on solution of potass. It crystalises in small cubes, and is permanent in the atmosphere. In alcohol, sp. gr. 810, it is insoluble, and requires fourteen times its weight of water at sixty degrees to dissolve it. In iodide of potassium it is more soluble. Iodate of potassa is decomposed by heat into iodide of potassium and oxygen gas.

Iodate of Silver—When to a solution of nitrate of silver iodate of potassa is added, iodate of silver is precipitated in the form of a white powder which is very soluble in *liquor ammonia.* From this solution it is deposited in small rectangular prisms which are free from ammonia.

Iodic Acid—A compound of one equivalent of iodine and five equivalents of oxygen. It may be prepared by the direct oxidation of iodine by nitric acid, or by the action of sulphuric acid upon iodate of soda. It is a very soluble substance; it is decomposed by heat, and its solution is readily deoxidised by sulphuric acid. It crystallises in six-sided tables, which contain water.

Iodides—Compounds of iodine with metallic and other bases. The principal iodides employed in photography are those of ammonium, cadmium, potassium, zinc, and silver.

Iodide of Ammonium—A deliquescent salt composed of iodine and ammonium. It is obtained in colourless cubes, which are anhydrous, but extremely soluble both in water and in alcohol. It is used as an iodiser for positive collodion, but it is not suited for negative on account of its great instability. It is also called hydriodate of ammonia.

Iodide of Cadmium—A compound of iodine with the metal cadmium. It is permanent in the atmosphere, and very soluble in alcohol and water. It is much employed in iodising collodion, which does not become discoloured by the liberation of iodine, as when iodised with the salt of potassium. Iodide of cadmium is considered to impair the fluidity of collodion.

Iodide of Potassium—A white salt composed of iodine and potassium. It is anhydrous; slightly deliquescent, and very soluble in water. In absolute alcohol it is scarcely at all soluble: in dilute alcohol it is soluble in proportion to the quantity of water present. This salt is extensively used in photography, both in the collodion and in the waxed-paper processes.

Iodide of Silver—This salt is formed when a soluble iodide is added to a solution of nitrate of silver. It is of a primrose yellow colour, insoluble in water and alcohol, and slightly soluble in nitrate of silver. It dissolves in iodide of potassium, forming a double salt. It is nearly insoluble in ammonia. It is very sensitive to the action of light, and is the principal agent in obtaining photographic pictures.

Iodide of Zinc—Iodine and zinc combine with great energy, producing a brownish deliquescent white salt in prismatic crystals. Its aqueous solution decomposes very quickly when exposed to the air. This salt is sometimes employed in photography, but its instability does not recommend it.

Iodine—An elementary body, of great importance in photography, obtained from certain seaweeds. It was discovered in 1814. It is solid, existing in the form of blueish-grey scales, which are readily volatilised by heat in the form of a beautiful violet vapour. It possesses an odour similar to that of chlorine. It is nearly insoluble in water, but soluble in alcohol and ether, which it tints yellow or reddish-brown; it is also soluble in chloroform and in sulphide of carbon, which it colours violet. It stains the skin and most animal and vegetable bodies yellow, but the colour quickly disappears, unless the organic substance has become decomposed. Iodine is extensively employed in the daguerreotype process and in the preparation of the various iodides.

Iron—Some of the salts of this metal are employed in photography, as the citrate, sulphates, hydriodate, iodide, &c. The protosulphate of iron is the most energetic developing agent employed.

Isinglass—The purest form of gelatine, consisting of the air-bladders of sturgeons. It is white, semi-transparent, devoid of smell and taste, softens in cold water, and dissolves in boiling water. It is recommended for use in photography by those who consider it superior to artificially prepared gelatine.

Ivory, Artificial—A substance so-called has been employed in photography for receiving photographic images. It is prepared by mixing sulphate of baryta with albumen, and rolling the plastic compound into sheets. Another kind, known as Pinson's, is obtained by immersing sheets of gelatine in acetate of alumina; when dry it will receive a fine polish.

Kaolin — China clay, pipe clay. A very white and pure clay, used in the manufacture of porcelain. It is composed of silica and alumina. It is much employed in photography for removing the colour of nitrate of silver baths, produced by the action of organic bodies, such as albumen, gelatine, &c. Paper is prepared in Germany with a surface of kaolin, like that of "enamelled cards," upon which proofs may be printed with very delicate and fine effect.

Foreign Correspondence.

Paris, April 23, 1859.

THE researches of M. Nièpce de Saint Victor in the matter of "bottled light" have not met with that candid reception and philosophical treatment we were justified in expecting from the country that has produced a Bacon, and which professes to conduct all its philosophical investigations on the inductine system laid down by that profound philosopher. It is but too evident that photography and philosophy rarely shake hands. They might be friends, perhaps, were it not for the jealous interference of empiricism.

M. Nièpce has just cause to complain of the manner in which the accuracy of his discoveries has been questioned; still more at the summary fashion in which they have been repudiated upon an empirical test. It was hardly worth his while, still he thought it necessary, to condescend to reiterate his assertions, and to point out to those who have professed to test his conclusions, the blind errors of their proceedings. The unlearned run little risk in implicitly adopting any conclusions upon which so profound and sagacious a philosopher as M. Chevreul has placed the seal of his approval. At a recent meeting of the *Académie des Sciences* that *savant* read, with approval, a note from M. Nièpce to the following effect:—

"By a simple experiment I can reply to the objections which have been made to my discoveries of the persistent activity of light. I placed in a refrigerator a tin tube, containing some cardboard, impregnated with tartaric acid. Exposed a sufficient length of time to the action of light, this tube was left surrounded with ice for the space of eight and forty hours, covering its orifice with a piece of paper rendered sensitive with nitrate of silver only, and dried. A piece of thin printing-paper, impressed with large letters, to serve as a negative, was interposed between the orifice and the sensitive paper. At the expiration of forty-eight hours I concluded that the 'bottled light' had acted sufficiently: I treated the sensitised paper with gallic acid, and the result I now present to the inspection of the meeting. Had the sensitive paper been prepared with *iodide* of silver instead of the *nitrate*, the image would have been much more vigorous; but such as it is, it proves, beyond doubt, that an action is really exercised by light, independently of *calorific* radiation; and that is all I wish to prove at present.

"As to the action of heat, I am aware it exists, since it has manifested itself in many experiments performed months ago, the results of which I shall soon make known; but to establish my priority of claim, I will at once state, that employing the obscure radiations emanating from a source of heat of 212° F., I obtained at will positive and negative pictures, according to the preparation of the paper. It is then evident that, under certain circumstances, heat may produce the same results which, in my first researches I attributed to light. Calorific or luminous radiations undoubtedly exercise chemical actions, which are quite distinct from each other, and which must not be confounded, even when they are exercised simultaneously. At a time when the distinction between the luminous and calorific effects was not so clear in my mind as now, I recommended that the tube containing the 'bottled light' should be warmed, I obtained a more rapid and and more intense impression, because the two effects were combined; but the experiment recorded above, in which the calorific agency is nullified, proves that light alone, independently of elevation of temperature and of moisture, is sufficient to produce very vigorous proofs.

"As to the objections derived from the fact that the image is not produced when a thin plate of glass or of mica intervenes, it is only necessary for me to refer to my first memoir, presented to the *Académie* on the 16th of November, 1857. I then remarked that the activity communicated by the 'bottled light' would not pass through glass; in this respect it resembles the luminous radiations emitted by burning phosphorus, which have no influence upon sensitised paper."

Very great interest was excited at the meeting of the *Académie* by the exhibition of some magnificent coloured photographs, executed by M. Victor Plumier, according to certain variations in M. Nièpce de Saint Victor's nitrate of uranium process. The colours in which they are printed are light and deep tones of green, lustre, orange-red, and sky-blue, of a purity and brilliancy truly surprising. These charming proofs exhibit one of the most beautiful applications of chemistry imaginable, which opens an unlimited extension to the boundaries of photography. M. Chevreul expressed the great pleasure and pride he felt in the labours of his indefatigable *protégé*. I will give the process by which these remarkable productions are obtained.

For red proofs — prepare positive paper with a solution of nitrate of uranium, of the strength of 20 per cent., leave the paper fifteen or twenty seconds in this solution, and drain and quickly dry it in the dark. Paper so prepared will keep good several days. The exposure in the pressure-frame will vary according to the intensity of the light and the strength of the negative: from eight to ten minutes in sunshine, and from one to two hours in cloudy weather.

On removing the proof from the printing-frame, wash it for a few seconds in water of a temperature of 120° to 140° F., then immerse it in a solution of red prussiate of potash of the strength of 2 per cent. In a few minutes the proof will acquire a blood-red colour; wash it in several waters, until the last remains limpid, then leave it to dry.

To obtain a green proof, take a red one, prepared as described, and immerse it for a minute or so in a solution of nitrate of cobalt, withdraw it, and without washing, dry at the fire: it is fixed by being placed for a few seconds in a solution of sulphate of iron, of the strength of 4 per cent., and 4 per cent. of sulphuric acid; wash in one water, and dry at the fire.

Violet-coloured proofs are obtained upon paper prepared with nitrate of uranium, as indicated for the red proofs. On removal from the pressure frame, wash the proof in warm water, and develope it in a solution of chloride of gold, of the strength of two grains to the ounce of water: when the proof has assumed an agreeable violet colour, wash it in several waters, and dry it.

Blue proofs are obtained by preparing negative paper with a solution of red prussiate of potash, of the strength of 20 per cent., and drying in the dark. Paper so prepared will keep several days. On removing the proof from the pressure-frame the solarised parts will have acquired a light-blue tint, it is then placed for five or ten seconds in a cold-saturated solution of bichloride of mercury; afterwards rinsed in one water; then immerse it in a cold-saturated solution of oxalic acid, warmed to 120° to 140° F., wash it in two or three waters, then dry.

It will be understood that this result, beautiful as it is, in no way solves the great problem of printing in natural colours. To obtain this coveted boon, we must first discover a chemical substance capable of assuming all the myriad-tinted hues of nature. Do we know of any such chemical chameleon? Shall we ever discover it? Perhaps so: in the same year with the Elixir of Life and the Philosopher's Stone! J. P.

New York, March 30, 1859.

THERE is so very little stirring at present among us in photography that material for a letter is not easily accessible, as nothing comes to the surface worth transcribing. The Journal mentioned in my last, popularly known as *Anthony's Monthly Advertiser*, for the 1st January, 1859, is yet unpublished (March 30th), and the *on dit* is that it is defunct for the lack of bank paper. *Humphrey's Journal* has changed hands; whether its "policy" will be changed or not remains to be seen, but it is to be hoped, at any rate, that something may yet appear in it worthy of the bright actinic atmosphere of America. Its new proprietor has extensively advertised his wishes to get matter for its pages from professional men; but I fear he has had the trouble and expense for his pains, unless he follows in the footsteps of his predecessor. Hitherto the American Journals have contented themselves with reprinting the articles, without selection, as they have appeared in your and other Journals of Europe, even your translations, typographic errors and all, and crediting the original Journal for the article itself and themselves as the translators, although neither of them can read any other language than the "American," and not that correctly.

I have just seen several cameras of the largest dimensions tried; their success was really astonishing, the image being impressed more rapidly than I should have imagined such large instruments to have done, and with a degree of sharpness and clearness not to be surpassed in a small instrument.*

* Our American cousins often attribute to the *camera* what we do to the *lens*, and thus give great credit for speed to the *carriage* instead of the *horse*.—ED.

These large cameras seem to be the order of the day here at present as well as in South America, whither some of those I saw were bound. All of them are portrait cameras, and are unquestionably the best made in America, as your readers may readily understand from the fact that for so many years they have held their own in the market, without having any Journal to celebrate their good qualities, as is the case with their only rival, which are as celebrated as the utmost efforts of *two* Journals could effect, whose whole energy seems to have been devoted to this exclusive purpose.

Notwithstanding this lack of *celebration*, the cameras of Holmes, Booth, and Hayden are as widely known as any instruments of American manufacture. The lenses are all made of imported German glass, and entirely worked by able German artisans.

Some of our public practitioners who have made cheap or rather *low-priced* "face-maps," advertise to sell out their stock and good-will, as they have made as much money as they desire out of a business which they say has averaged 50,000 dollars per year! All have not been so lucky.

Nothing new in the way of apparatus has recently come under my notice, although I visited all the respectable ware-rooms for the purpose of seeing any such, if on sale.

The oldest establishment of the kind in this city is that of the *Scovill Manufacturing Company*, which is the most extensive in America, and has been in the business from its earliest days. Here everything required in the art may be obtained, and I am not certain that any house in London or Paris is more complete in its arrangements than this. This firm sends a large quantity of goods to Europe, and its annual receipts must be immense to keep so many employed in the sales' department alone.

Second to this house in the *age* of their establishment is *Holmes, Booth, and Hayden*, already mentioned. Their establishment is hardly so extensive as that of the former, but for the quality of their goods they are not be surpassed; while with their cameras they cannot be approached, so far as I have had an opportunity of judging.

In my next I may have a few words to say of some of the other houses in the business, and as both time and space are alike exhausted for the present, I must make my *congé*.

ARGUS.

Correspondence.

DETAILS OF HONEY PROCESS.

To the Editor.

Sir,—Having generally been as successful as perhaps most amateurs with Taupenot's and Fothergill's dry collodion processes, but wanting to expose three or four plates near home, on Good Friday, it occurred to me that the honey process would be the most easy to manipulate.

I accordingly set about to prepare the plates; and, first of all, after cleaning, took the precaution to albumenise them, as recommended by Mr. M'Nab (although I believe Mr. Barnes was first to make known this plan); with the collodion I used it was, perhaps, needless to perform this operation; but having seen the collodion film slip off the glass, there was no harm in trying the experiment. I need scarcely add, that in this particular I was successful, for no amount of rough washing affected it in the slightest degree.

The collodion was Keene's, iodised last September, and now is scarcely tinged with yellow. The bath was prepared, according to Mr. Thomas's directions in the *Journal of the Photographic Society* for August last. The plate coated and sensitised in the usual way, drained, and a portion of honey solution poured on and off two or three times (the honey having been prepared twelve months), and drained for about half-an-hour.

Before going out, I exposed a plate, as an experiment, on a view from the window—Petzval lens, eleven and a-half inches focus, half-an-inch stop, three minutes. On developing it (iron one drachm, citric acid four grains), the picture started out immediately, and was very red and feeble by transmitted light. I concluded it was over-exposed.

I went out, and gave the first plate one minute, the next two minutes' diffused light; on applying the same developer to the plate exposed one minute, the picture started out almost as soon as before. The detail was all there, but very feeble, no after treatment bringing up the intensity. I developed the two-minute plate with pyrogallic acid: the image appeared at once, but was, if anything, rather more intense, although useless for printing. From this one might infer that with a honeyed plate, a short time after preparation, instantaneous pictures might be taken with suitable lens, &c.

Would you recommend more acid in the bath, or a more highly coloured collodion (both are in good order for the wet process), or to work on with the same, giving shorter exposure, or a weaker developer? The *modus operandi* is so simple, I would like to be able to work the process occasionally. There is, though, a great difficulty in clearing the iodide off the plate. I steeped it in hypo two hours, and then by reflected light, the image appears quite grey and misty, just as if it had not been fixed.

Yours, &c.

CAUSTIC.

[Our correspondent has hit upon a direction in which we have been making some experiments—and which we have been obliged from circumstances to set aside for the moment. We are not so sure even now that his misty picture is not available, that is, if he has left it intact.

We found that proceeding just as above described, we got an impression with a very short exposure, but, what is very singular, the picture *was not in the collodion* but in the albumen, for we removed the whole of the collodion, by washing it with water and rubbing it with a sponge, and with the collodion we *took off all the fogginess.* Unfortunately we handled it very roughly, and scratched the albumen with some particles of grit in the sponge; but we have no doubt that, with very little care, the collodion might be entirely removed with a wet tuft of clean cotton, and the negative subsequently intensified with pyrogallic acid and silver solution. We think there is an excellent field open here for experiment. With regard to the honey process itself, we find it of the utmost convenience where we wish to prepare and use plates at a short notice, which we sometimes have done before breakfast of a morning, including exposure, leaving the developement till night or the next day. We find that one part of syrup to three of distilled water is quite strong enough for the purpose, and is much more pleasant to manipulate with. The previous coating of the plate with albumen should be avoided, and is quite unnecessary, especially with Keene's collodion, which by the way we find admirably adapted to this process.

Before concluding we would remark that we have recently met with honey which produces a milkiness of appearance on being first poured over the plate—we have found a remedy in adding about ten drops of 30 grains of solution of nitrate of silver to each ounce of syrup *in the dark*, allowing a precipitate to fall and filtering the syrup—no darkening takes place, nor does the syrup turn milky when used subsequently. [Ed.]

IRON DEVELOPER WITH SYRUP, &c.

To the Editor.

Sir,—In the April 1st number of your Journal, page 78, you recommend honey syrup to be added to the iron developer, for dry plates. Please kindly inform us (1) how to prepare the honey syrup, (2) and if it may be used also for wet plates, with the iron and citric acids of same proportions, and oblige,

TWO CAPTAINS ROYAL ARTILLERY.

[1. Take of honey *two* parts by measure, distilled water *three* parts: place in any convenient vessel, and dissolve thoroughly by heat; filter through bibulous paper, an operation that proceeds very slowly.

The object of filtration is to remove the pollen, &c., which is always present in honey, and would cause spots if left in the syrup.

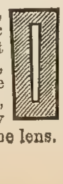
One use of this syrup with the iron developer is to produce *intensity*, which it does in a marked degree.

2. We do not recommend citric acid with the iron developer for *wet* collodion, because it does not mix readily with the solution of nitrate of silver on the plate, acetic acid in this case answering better; but the syrup is just as useful as with dry plates, and acts in a similar manner. —Ed.]

FLASK APERTURE.

To the Editor.

Sir,—I am afraid I cannot shelter myself under your editorial ægis in relation to my bottle diaphragm, or rather *aperture*, as I was fully aware of the construction of *Marten's* panoramic camera,—having not only seen several, but made one with my own hands. But in reply to your correspondent, W. E. Kilburn, p. 63, I may say I did not claim to have invented it, for I said (p. 5), "send you the description of the diaphragm and aperture I have now *used* for several years." I leave all the *re*-inventions to his own countrymen, some of whom are exceedingly expert at this process, there being here now two recently patented diaphragms, both of which were described years ago in various Journals, to say nothing of that "bromide in collodion." I would further say, that I go further back in my reading than Mr. Kilburn himself, for the idea of stopping out a portion of the rays from any part of an object which would act too powerfully on the plate belongs to *Lerebour*, of Paris, in the first edition of whose pamphlet on photography, on *research*, Mr. K. may find that L. used a leaf of a tree for effecting this object. From this I got *my* idea of the aperture, the chink *(fente étroite verticale)*, of the panoramic camera, such as in the sketch. This chink is rather narrower at bottom than at top, is placed immediately in front of the *plate*, and not near the lens at all, for its use is to circumscribe, not the rays admitted by the lens, but the part of the plate to be impressed, so that it is as long as the width of the plate, whatever that may be—even if as long as five or more times the entire diameter of the lens.



To avoid any further charge of *piracy*, I may say, that my scioptic camera *is* founded on Marten's panoramic camera, but only so far as the revolving box and the above chink are concerned, but no farther. *His* will only impress cylindrical plates, while mine impresses *plane* surfaces, such as albumenised or collodionised glasses. As every part of it, except the lens, was made by myself, the workmanship is not so perfect as if it were made by a machinist.

Mr. Kilburn will, I hope, see fit to institute what he recommends to others, "a little research," or else his candle *will* "go out in a stink" for neglecting to see whether an *invention* was claimed, instead of assuming such to be the case. I cannot profess to have read *all* that has been written on the subject, but I have read a tolerable proportion, and when I want to make claim to re-discover anything, I shall not, like a countryman of his, assert that although such a thing may have been printed by another before me, I have *ascertained* that no copy of *that* publication had reached this country at the time my discovery was printed here—even though a period of four months had elapsed, and ten days being ample for the purpose. *The Photographic Journal* reaches its subscribers in New York and Boston often in ten days, and seldom over fifteen from the day of its publication, although that fact is ignored by the circulars announcing a new process for sale, which has just been copied from its pages.—Yours, &c. WM. ROSS.

New York, March 28th, 1859.

COPYRIGHT.

To the Editor.

Sir,—Will you oblige me by an answer (in your notices to correspondents), to the following queries?

Suppose I purchase from the publisher of certain engravings the exclusive right of photographing for sale reduced copies of them, does the law protect me in such right? And does it protect me against photographic *copies of my photographs* from such engravings being issued for sale?—Yours, &c. L. M.

[This is a purely *legal* question, and as such we cannot be expected to give an authoritative reply; but so far as we understand what has been laid down as the law upon the subject, a copyright *does* exist as regards an engraving, and *any reproductions thereof of any sort*, consequently including photographs of it. Any one pirating a photograph of an engraving would therefore be amenable to the owner of the copyright or his assigns. It is held, however, that photographs of natural objects are not in the present state of the law protected by copyright.—Ed.]

PREPARING GLASS PLATES WITH ALBUMEN.

To the Editor.

Sir,—Referring to the last number of *The Photographic Journal* (April 15th), page 102, I perceive that your correspondent, Mr. Jones, of Cheltenham, has been a little perplexed with regard to the article upon coating glass plates with albumen. His difficulty, I think, arises from a slight error in the paragraph he alludes to, viz., the substitution of the definite article for the indefinite. Instead of reading "*the* plate was taken," &c., it would be better rendered thus:—"*a second* plate was taken," &c., &c. I would at the same time remind your correspondent that the method applies exclusively to the *preparation* of plates *previous* to their being collodionised, and is adapted for either process, wet or dry, negative or positive.

Plates prepared with albumen will not, however, work clean if kept for a length of time, hence the necessity of coagulating with iron; but if thus treated, and afterwards washed, dried, and stored away in a dry box, will work as clean as if newly prepared. In proof of this assertion, Mr. Young prepared four plates, and made trial of them at intervals, extending over a period of two months, and in *every* instance found them to give perfect results; this is one point satisfactorily established, viz., that plates thus coated will keep good for the above-mentioned time.

I wish it to be clearly understood that if the method be faithfully carried out, the result cannot fail to be successful; and here I would reiterate the assertion, lest any misapprehension may arise in any one desirous of following out the experiments, as it has been mentioned to me by a practical photographer, that it was a failure in *his* hands; upon inquiry, however, I found that the trial had not been fairly made, from the circumstance of his only adopting *one* part of the formula and rejecting the other.

I am further of opinion, that unless the albumenised plates be coagulated previously to being coated with collodion, there will be trouble with the silver bath. This opinion is confirmed from the fact, that those who have complained of their non-success have omitted this important point.

In reply to your other correspondent, "Querist," I would state that the advantages are: the adhesion of the films to the plates; saving trouble in cleaning the glass; also that cheap picture sheet can be used instead of patent plate: the exposure is the same, neither longer or shorter, and the developer, either protonitrate of iron or pyrogallic acid. Any *good* collodion, but I prefer my own make, the formula for which can be had at a future time, by those to whom it may be of service.—I am, Sir, yours truly,

Glasgow. A. M'NAB.

PHOTOGRAPHY FOR ORNAMENTATION.

To the Editor.

Sir,—I have often thought it strange that the same idea should suggest itself, and be carried out much in the same way, by more than one individual about the same time; the following is an instance:—

A few weeks since, I thought that portraits on leather, cloth, or paper, would be very suitable for putting upon books or book-markers, intended for presents to friends.

I procured a book and some markers, and attached leather portraits to them for show in a small case, when a young lady (a customer) told me that the last leather portrait I executed for her had been sewed on to a book-marker by a friend. Subsequently, other two persons told me they had seen photographs applied in a similar manner. I now find that book-markers, with photographs of engravings, pasted on one end, may be had at wholesale stationers at 4s. per dozen, which is cheap enough.

I was not aware that any other person had applied photography thus till after I had begun to do so.

I enclose a small leather portrait on a card.—Yours, &c.

Glasgow, April 19, 1859. A. R.

[Not only are photographs thus applied in London, but one firm, we believe, is pretty extensively engaged in preparing visiting cards with the owner's portrait attached. All that we have seen are, however, printed on paper.

The specimen sent by our correspondent has considerable merit—the whites are extremely good, and the lights generally not degraded in tone, as unfortunately generally is the case when transferred to leather.

If our correspondent is willing to communicate the details of his method of operation, we have no doubt it will be acceptable to many of our readers.—Ed.]

HINTS TO MANUFACTURERS.

To the Editor.

Sir,—I beg to suggest the desirability of making the groves of plate boxes in this fashion VVV, instead of the usual V shape; the backs of the plates would thus lie against the flat surface, whilst the faces would have the minimum of contact with the angular.

It would also be preferable to have them made of copper or tin (not tinned iron).—I am, yours, &c.

April 26, 1859. AJAX.

[We have seen racks made of the form suggested in *gutta percha*, by Messrs. Murray & Heath, of Piccadilly—a material, we think, better adapted for the purpose than copper. Tin (not being tinned iron) we do not consider at all available. We do not perceive any impediment to the use of wood for the purpose. Racks made of tinned iron are very useful for dry plates; and in this case, a form which we have in use answers beautifully. They are arranged as annexed—UUUUUUUUUU—Ed.]

ANSWERS TO CORRESPONDENTS.

A.—The cleaning of glasses, coating with collodion, &c., have been too often described to need further notice here.

Nathaniel V.—Perfectly correct—photosulphate of iron and *citric acid*.

F. C.—You do not mention what *sort* of lens, whether for portraits or landscapes, nor the size of the picture. We cannot, however, undertake to recommend any particular maker; but have no objection to state what principle of lens we should advise.

An Amateur—We have never tried to remove silver stains from marble; but should try the following, viz.—Apply, first, tincture of iodine to the spots pretty freely, and let it dry; then cyanide of potassium.

A Soldier—Many of the men amongst the sappers and miners are good photographers. We see no reason whatever to expect that your following the pursuit of photography could be offensive to your officers.

Printer on Albumenised Paper—We have recently tried a new make of English paper, which we much like—it was given us by Mr. Hardwich, and coated, if we mistake not, by Mr. Spencer; we will ascertain the maker's name for you.

Thomas Gulliver—Your specimen is not likely to have changed—it could not be worse: it is quite useless, and we will return it as you desire. We will endeavour, in a few days, to comply with your other request.

D.—We shall be most willing to help you out of your difficulty; but you give us no clue to your failure. What paper do you use? How long before use do you make your toning bath? How long do you leave your proofs in it? How do they look before being put in? &c., &c.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 94, Vol. VI.—MAY 15, 1859.

We are strongly of opinion that during the forthcoming season, as connected with practical photography, considerable progress will be made in attaining greater sensitiveness of the dry collodion film. Various well-established facts and observations appear to converge towards this desideratum. As cases in point, we may cite the productions of Mr. Kibble, of Glasgow, and also draw attention to some remarks let fall by Mr. Hannaford, at the recent meeting of the North London Photographic Association reported in our last.

We cannot forbear remarking, *en passant*, on the very *practical* nature of the discussions generally occurring at this modest suburban society, and the earnestness with which the members figuratively throw themselves into them, as evincing the great advantage derivable to the art from the formation of like local associations, not as substitutes for, but as supplementary to, The Photographic Society, acting towards it somewhat in the same relation as the militia corps does to the regular army—a sort of preliminary depôt, in which the awkward squad becomes converted into the trained and skilful operator, and the useless drones are filtered out.

We very recently assisted at the "birth" of another of these useful training photographic colleges, the South London Photographic Society. A report of the preliminary meeting will be found elsewhere in our columns.

We perceive that the *principle* of Fothergill's process appears to be gaining ground, other substances being substituted for albumen, such as metagelatine, gum, &c., the *principle* however being retained by flooding the sensitised plate with the preservative solution, after dilution of the free nitrate of silver remaining on the plate, and *subsequently washing away as much of the preservative medium as remains uncombined with the silver solution.* This point is the very essence of the Fothergill process (whether Mr. Fothergill knew it or not), and whatever modifications may be made in the material, so long as this feature is retained the process must be regarded as a modification of the original suggestion.

This reminds us of another matter upon which we have a few words of remark to make. In a paper read by Mr. Dorrington at the April meeting of the Manchester Photographic Society, that gentleman made some observations, by which it appears that he somewhat misunderstood what he is pleased to designate as our "editorial fulminations of an infallible decision" against the "Raspberry Syrup Process."

Like the man who was astonished one day at finding that he had been in the habit of speaking prose all his life, we are equally surprised at finding that we are accused of having "fulminated." We have however a very strong persuasion that our *thunder* must be of the kind known as *buttered*. But to return to the point in discussion:—we never questioned or doubted that negatives, and good ones too, could be taken by the aid of raspberry syrup, especially by a skilful operator like Mr. Dorrington; but what we felt called upon to condemn was the claim set up to the suggestion of an *advantageous novelty*, with the further addition that there were "chemical reasons" for the employment of this material, which "chemical reasons," by the way, were prudently not quoted. We asserted that "raspberry syrup" was in fact only an inferior kind of oxymel; that any result obtainable by the former would be more surely attained by employing the latter; and that no sound reason could be given for calling it a new, or even an improved process. Had the promulgator contented himself with stating that in the absence of the supply of oxymel he had availed himself of raspberry syrup as a *substitute*, we should have applauded his ingenuity; but in putting it forth as a *new process*, asserting also that there were "chemical reasons" for its use, he fairly threw himself open to ridicule, and we maintain that it was our duty to lay on the lash; there are many, very many practitioners of photography who have no knowledge of chemistry, and placed as we are, as a watchman *on the look out*, it is as much our business to utter a note of warning when we perceive the danger of many being misled, as it is to sound the praises of the *bona fide* discoverer, or to make an attempt to rescue from oblivion a good suggestion when cumbered by other matter that would probably cause it to be hastily cast aside.

In noticing the allusions of Mr. Dorrington, we have not done so with any feeling of annoyance, on the contrary, we are obliged to that gentleman for affording us an opportunity of explaining what we have probably expressed but obscurely on a former occasion; which indeed must have been the case, or so acute an observer would not have been likely to have misunderstood our drift.

We are much amused at the cool manner in which our Paris correspondent, as appears from his letter in our last number, attempts to regard the matter of M. Nièpce de St. Victor's "bottled light" as a settled question, and the accusation of its reception in this country in an uncandid and unphilosophical spirit.

This is not so bad, when further on we read, as quoted from M. St. Victor's communication, "It is then evident that, under certain circumstances, heat may produce the same results *which in my first researches I attributed to light*," and yet it is but very recently, that in attempting to convince Professor Wheatstone of the alleged fact of the persistent activity of "stored-up light," that he made use of *heat* to produce the effect, an effect which Mr. Crookes subsequently demonstrated was as well produced without any insolation as with it. If our readers will turn back to the said letter, p. 114, they will perceive how M. Nièpce de St. Victor pretends to reply to the objections made "by a single experiment."

We assert that it is no reply at all. Does this gentleman presume to declare that because the said tin tube containing, as he contends, the "stored up light" is surrounded by ice, that no evaporation can go on?

Again, why does he call it stored-up *light*, if he asserts that it will not produce the effect through the thinnest of glass or mica? It is clearly invisible, whatever it may be; and as there are at least two of the most important qualities of *light* wanting, we contend that he has no right whatever to assume that it is *light* which acts. We have another suggestion to offer: let him try with his paper-negative his experiment again, but let it be previously *well waxed* to prevent the passage of vapour, and we more than suspect that he will not succeed.

We by no means feel certain that the so-called new action of light may not result in a much more extraordinary discovery, no less an one than that *lusus naturæ* known as "a mare's nest." In short, that "bottled sunshine" is little else than "moonshine."

The certain variations of what is termed *M. Nièpce de St. Victor's* Uranium Process are, as well as the process itself, a rediscovery of an Englishman's or rather a Scotchman's previously published experiments. Our frequent contributor, Mr. Burnett, not only published them long ago, but also exhibited specimens at the meeting of the British Association when held in Glasgow.

We confess that it does excite in us no small degree of annoyance to find how our French neighbours will persist in claiming these suggestions in the face of such distinct documentary evidence of priority of publication by Mr. Burnett as has been set before them.

Palmam qui meruit ferat. In our last we published under this this title some observations on a claim made by Mr. Sidebotham, of Manchester, on behalf of Mr. Dancer, of the same city, to priority of time in suggesting and producing what are known as micro-photographs. We felt bound to do this, believing at the time that we had been the *first* to originate them; and, having many times incidentally asserted as much, we could not let the matter pass unnoticed, without its appearing that we had attempted to arrogate an honour due to another person — a proceeding which we hold in very especial contempt.

We have now only to state that we made the claim in perfect good faith, believing most strictly such was the fact. We certainly never saw or heard of anything of the kind until we personally produced specimens; but, as appears from the report of the meeting of the Manchester Photographic Society in our current number, we were *anticipated by Mr. Dancer*, who executed specimens about twelve months earlier than we did. We trust that this gentleman will excuse the apparent wrong, committed in entire ignorance by us. To those who know us we are convinced that we need say nothing in vindication; to those who do not, we hope the present acknowledgment will make satisfactory amends.

A NEW COLLODION FOR FIELD WORK.

By J. E Mayall.

[Read at the Meeting of the Photographic Society, 3rd May, 1859.]
(Communicated by the Author.)

The prime requisites for a collodion for landscape photography are: — that it shall be stable in its composition, not easily decomposed at the varying temperature to which it is liable to be exposed; that it shall not become troubled by agitation; shall contain within itself the property of absorption of some of the moisture to which it is unavoidably subjected; and that the film, when silvered, shall have good keeping qualities; not liable soon to dry, to fog, to spot, to tear, to come off the glass, or to the thousand and one difficulties to which the landscape photographer is now liable.

The bath, the developer, and indeed every part of the process should be looked at from the point of view that the operator is in the country, far from the succouring aid of the chemist's shop, the advice of friends (which, by the bye, is no great loss), or the accidental obliviousness of some important article left behind in the last hurry of departure.

I may remark I have had these difficulties in view in perfecting the process which I have now the honour to read to this Society.

Preparation of the Pyroxyline.

Red fuming nitrous acid of commerce, s.g. 1·450 (Nitric acid impregnated with nitrous oxide.)	4 ounces.
Water	½ "
Sulphuric acid, s.g. 1·830	5 "
Blotting-paper	100 grains.

Cut the paper into strips and slightly damp it with steam; mix the nitrous acid and water, and then add the sulphuric acid in a bell glass, very *thin*, to stand the heat; put the paper into the acids with a glass rod, and cover up the vessel with a piece of flat glass; let it stand in a basin of hot water until the temperature of the acids reaches 130 degrees Fahrenheit, for twenty minutes; pour out the acids into another glass, and wash the paper as rapidly as possible to get rid of the bulk of the acid, and afterwards allow it to stand under a running stream of water for six hours.

To the acid remaining from the foregoing process add an ounce of sulphuric acid, and then put into it, in small tufts at a time, fifty grains of clean cotton-wool; get up the temperature of the acid to 130 degrees Fahrenheit again; soak half-an-hour; wash the cotton, as before directed for paper, six hours in cold water, and dry at the ordinary temperature of the atmosphere, merely towards the last dry by gentle heat, and when dry, expose the pyroxyline to the rays of the sun for half-an-hour. The increase in weight ought to be at least fifty per cent.

Remark.—As it is difficult to obtain acids of the exact specific gravity above-named, the operator must, for weaker nitrous acid, use a little more sulphuric in proportion; an excellent plan is to try three samples with varying quantities of sulphuric acid, until the exact proportions are found.

Mr. Hardwich recommends 140 degrees as the temperature of the acids, but as he uses much more water and sulphuric acid in proportion to the nitric acid, it can do no harm; but I find on increasing the temperature beyond 130 degrees, there is a loss of weight in the pyroxyline, also it becomes powdery, which is not a good quality for negative collodion.

Observe — the heavier the pyroxyline is from a given quantity of paper or cotton, the better is its quality.

Ether,

Pure or methylated, if well washed and rectified, and not acid, I find equally good; specific gravity ·720.

Alcohol

Should be especially prepared for this purpose. Ordinary alcohol, s.g. ·820, should be well agitated with dry carbonate of potash and chloride of calcium for two days, say an ounce of each salt to one gallon of alcohol, to render it almost, if not entirely, *anhydrous*; then distil over, in a water bath, out of doors. The s.g. of anhydrous alcohol is ·794, but a gravity of ·800 or ·807 will answer. The chemists prepare this, and no one who has not had considerable experience in this operation ought to attempt it. The alcohol thus prepared is almost as explosive as gun-cotton.

Collodion.

Alcohol, anhydrous	2 ounces.
Ether	10 "
Iodide of magnesium	120 grains.
Bromide of ammonium	45 "
Chloroform	2 drachms.

Shake the chemicals well together until the whole is dissolved; should the bromide of ammonium be difficult to dissolve, add a few drops at a time of ordinary alcohol to assist it, but not more. When perfectly dissolved, add 180 grains of pyroxyline from paper, and sixty from that of cotton, agitate well for two or three hours at intervals; try a plate — if the collodion is too thin, gradually add a little more pyroxyline until the proper consistency is obtained. Here it is difficult to give the exact weight of the pyroxyline; for one kind is much more soluble than another, owing to some accidental circumstance in making it.

This collodion will keep excited for two years without any perceptible change, either from varying temperature or when ordinary care is used to keep it from the light.

Remark.—The iodide of magnesium has properties eminently qualified for out-door work. Its easy solubility, particularly in the presence of a salt of ammonia, is well-known to every chemist, and is indeed its chief characteristic to distinguish it from *lime* on the one hand and *strontia* on the other; and being such a powerful absorbent of moisture, it prevents the decomposition of the excited collodion. The bromide of magnesium is even more deliquescent, and is an excellent excitant also where extreme sensitiveness is not required, but not near so rapid as the combination above given.

In order that the amateur and practical photographer may not be foiled in the attempt to put this process into practice, I now give another formula that answers very well—my friend, Mr. Rosling, says better than anything he has tried.

Collodion, No. 2.

Ether, s.g. ·720	20 ounces.
Alcohol, s.g. ·820	16 "
Iodide of magnesium	144 grains.
Bromide ......do.	54 "
Chloroform	3 drachms.

Shake well together; then add sufficient pyroxyline to render the collodion of moderate consistency, say eight to ten grains per ounce; shake well again, and add four drops of a saturated solution

of iodine in alcohol and eighteen grains of bromide of ammonium, or, instead of the latter salt, three ounces of old excited ammonium collodion will bring the mass into working order in twenty-four hours; decant into six-ounce bottles, and hermetically seal them for use.

I may remark, in passing, that the bromides are the true key to the middle tints: if you want excessive detail, as in leaves of trees and opaque objects, use more of these bromides; if you want intensity, use less.

NITRATE OF SILVER BATH.

Nitrate of silver	50 grains.
Distilled water	1 ounce.
Glacial acetic acid	1 minim.
Nitric acid	$\frac{1}{6}$ "
Iodide of Magnesium	$\frac{1}{4}$ grain.

First neutralise the solution of nitrate of silver with caustic potash, and then, for every ounce of bath, with the quarter of a grain of iodide of magnesium, precipitate a small quantity of iodide of silver from the nitrate; well wash the precipitate before adding it to the bulk of the solution of silver; stand a few hours and filter; then for every thirty ounces of bath add thirty minims of acetic acid and fifty minims of nitric acid, so as to render the bath decidedly acid: this bath will keep for any length of time by now and then adding a crystal of nitrate of silver to dissolve the excess of iodide of silver which accumulates in the bath, and every few days add a few drops of glacial acetic acid. A good plan is to refresh the bath with a sixty-grain solution of nitrate of silver, properly prepared according to the formula given, and refresh the bath every night after working. The specific gravity ought to be from eight to ten degrees; if less than eight degrees the bath must be refreshed with additional nitrate of silver.

Once a week expose the bath to the sun's rays for half-an-hour. No other collodion must be used in this bath.

As there is a large quantity of alcohol in the collodion, the film requires to be well set before dipping it into the silver bath.

DEVELOPER.

Two ounces of iron tacks and two quarts of water put into a stone jar with a cover, to which add two ounces of sulphuric acid, and in forty-eight hours a solution of protosulphate of iron will be formed of about the strength required for a developer. Of this solution take ten ounces, to which add two ounces of common acetic acid (thirty per cent. acid) and one ounce of alcohol. One or two trials will indicate if the developer be strong enough. If the image of the camera comes out too quickly on spreading over the developer, reduce it with distilled water till the required strength of the developer is once obtained, and then observe it.

To refresh the iron jar again add two quarts of water and two ounces of sulphuric acid; cover the solution with a lid to exclude the air, and it will be ready when wanted. It will keep better if six ounces of alcohol be added to every two quarts of iron solution, and bottled off and kept in the dark.

ANOTHER DEVELOPER.

Protosulphate of iron	2 ounces.
Distilled water	1 quart.
Alcohol	4 ounces.

Dissolve the iron, and call this the stock solution. To every ten ounces of protosulphate of iron solution add two ounces of common acetic acid (thirty per cent acid); a few drops of sulphuric added to the stock will keep the developer clear from fogging. Always filter the solution just before using.

As the whole of the process is exceedingly sensitive to light, the greatest care will be requisite to exclude stray light, both of the dark room, of the slides, and of the camera. Wash the plates well before fixing.

FIXING SOLUTION.

Cyanide of potassium...	12 ounces.
Water	2 quarts.

Either in a bath similar to the collodion bath, or by pouring on the plate separately. Hyposulphite of soda is a good fixing agent; but I find the negatives fixed with hyposulphite bleach afterwards, unless they are uncommonly well washed.

CONCLUSION.

The practical photographer will at a glance see the value of this process as a whole.

First, his collodion is not liable to decomposition; it is always the same; it contains within itself a powerful corrective of moisture, and consequently of decomposition.

The bath is not liable to fog, as it is always decidedly acid, and requires to be so; it also contains traces of nitrate of magnesia, which is a preservative agent, and enables the plates to be kept a long time moist. The mixture of paper and cotton renders the film much tougher; it will resist any amount of washing.

Should there be any signs of reticulation of the film it arises from the alcohol not being sufficiently rectified, and in that case more ether will be required in proportion to remedy this defect.

I have preferred to give the process just as I work it, no matter how it may jar with any theories or any other practice. My friends who have taken the trouble to work it, some of them in the tropics, others at the antipodes, and others again in the icy regions of Canada, all write of their success; and should the indomitable photographer of this country find in it a process that he can take up and leave off at pleasure, without any of those mortifying failures which sometimes overtake the most persevering, I shall be amply repaid for the trouble I have taken in bringing it before the Society.

COMPARATIVE EXPERIMENTS ON SOME OF THE DRY PROCESSES.

By JOHN DRAFFIN.

[Read at the Chorlton Photographic Association, May 11th, 1859.]

I THINK it is now generally admitted that on journeys for photographic practice, a good dry process is far superior to the great inconvenience of taking out all the apparatus requisite to work the wet collodion process, especially in hot or windy weather.

Now, having for the last twelve months been exclusively engaged in outside practice, as well as cathedral, &c., interior, I, of course, have endeavoured to ascertain with some degree of certainty which of the various processes recommended would suit me the best. Accordingly I made a series of experiments with the following:—M. Taupenöt's, Dr. Hill Norris's, Mr. Fothergill's, the Honey and Raspberry Syrup processes. The result was that I rejected the two latter, and determined to continue my practice with the three first named, which I did for a considerable time, taking three negatives of each subject—one by each of the three methods.

It is not my intention to argue that this, that, or the other process is best, but simply to lay before you as accurately as I can the results given, the method adopted by myself in preparing the plates, the length of exposure in each case, and the degree of light and nature of subject taken; and I purpose illustrating this to you by means of specimen prints. It will, then, be for you to judge which you think the best process to adopt for general purposes. I say, all three are exceedingly good, and especially are they so for out-door practice; in fact, for this purpose there is very little to choose between them when proper care is taken in manipulation. But as I proceed, you will perceive that it is not only for outside photography that a process should be good to make it all that is wanted. I find to a certainty that in places where there is a deficiency of light—as for instance, a thick wood, or the interior of a church or cathedral—that M. Taupenöt's process must take precedence of all others. This I can prove, I think, to your satisfaction, when I state that, a short time ago, a fine old chest was taken out of the wall of the vestry of York Cathedral, where it had been hid for a long time. This chest being a magnificent thing of its kind, I determined to obtain, if possible, a photograph of it, and obtained permission to do so. Accordingly I set to work with three plates—Taupenöt's, Fothergill's, and Norris's. Now, the chest being immoveable, is fixed in a niche in the wall of a dark dismal room, the vestry, and is itself quite black. I exposed each of these plates five hours; the result was that Fothergill's was a failure, completely so—Norris's considerably better—and Taupenöt's the specimen before you, which I think you will admit is a decent thing, considering the circumstances.

Now, on the other hand, outside, I exposed, on the same day, one each of Taupenöt's and Fothergill's, from the same series of plates, prepared at the same time. The "Spires of St. Mary's Abbey, from the City Walls" is the one in question. It was taken at twice; one-half of the picture is by Fothergill's, the other Taupenöt's; the former you will perceive is more exposed to all appearances than the latter. The time given was: Fothergill's, 1 minute; Taupenöt's, 35 seconds; full sunshine—4 inch focus, $\frac{1}{4}$ inch stop, as a proof that the exposure was quick. You will perceive in Taupenöt's that several men who were at work in the grounds are actually taken in the act of filling a barrow, although they had no notion that I was photographing—in fact, I was at least one-eighth of a mile distant. I will now call your attention to three other pictures of ordinary light and shade, viz., grass, trees, masonry, &c. These views were taken immediately after each other—the exposure as follows:—Taupenöt's 45 seconds; Dr. Hill

Norris's, 1 minute; Fothergill's, 1½ minutes; and also to another picture, taken from a great distance, so as to enable me to obtain the various objects of interest a moderate size for a picture, I used a 14 inch focus, powerful lens, with a ½ inch stop. I gave both pictures (right and left) the same exposure, 2 minutes: one is Fothergill's, the other Taupenöt's; the plates used were the ordinary 6¾ × 3⅜, but the prints were cut down to make a stereogram. Now you will see here that there is a very marked difference between the two pictures. The next I would call your attention to is a picture taken by Dr. Hill Norris's and Taupenöt's, the exposure being exactly the same — 1 minute, rather weak sunshine. Very little difference here, but Taupenöt has it. Next, to two interior views of York Minster — one by Fothergill's, the other Taupenöt's. Fothergill was exposed 4 hours, Taupenöt ¾ of an hour, both the same subject — the Nave — only one looks east the other west; the light all came from the south, so that both had the same light. Here you will see there is no comparison. The beautiful view of the South Aisle in York Minster is, perhaps, the best one of the kind I have produced. It is a Taupenöt plate; and you will observe although exposed a full hour, the beautiful window is perfectly given, and has not suffered from over exposure. In this respect I find Taupenöt's process far superior to any other, and here chiefly where I am at issue with those who condemn this process, because if their practice has been confined to country, &c., views, they are not capable of judging the great merits of the process. Comparatively speaking, I am aware that very few interior pictures are done, because of the great and manifold difficulties to encounter. Still, if we want to adopt *the best dry* process, it must be that one which is equally good for interior as well as exterior, and not the one good for exterior only.

Now, from the remarks which have been made here respecting three processes, it will be inferred (and correctly) that I am in favour of the collodio-albumen process. I have no doubt some parties will say, you have not prepared your Fothergill's plates right; you must have let *one or two drops of the four drachm washings fall off one corner* of the plate, or you have washed too much. In answer I beg to say, I think I can manage the *four drachm washing* as expertly as most people; that I can also wash with a ten-grain silver solution; that Keen's collodion is to be had by me as well as by other people; that I know how to make a neutral bath of silver. I not only think, Mr. Chairman, that I can do all this, but have followed in my experiments, all out to the letter. And I think I dare challenge the best practitioner in Fothergill's process to produce for me a good negative, taken in twenty-five to thirty seconds, four-inch focus, three-sixteenth stop, as I saw stated had been done some time since. I have put myself to a considerable amount of trouble and expense in ascertaining the above facts; because, knowing the amount of work I had before me, I was determined to find out and adopt that system best calculated to enable me to get together what I have — some hundreds of negatives of interest to all tourists in Yorkshire, &c.

For the benefit of those who may feel disposed to try their hands at a dry process, and for the satisfaction of others, I will proceed to state the mode I have adopted in preparing the plates by the various processes in question.

Collodio-albumen.

Collodion.—Any collodion will do, provided it is not rotten. Old collodion is the best — and as a rule, I prefer it thin.

Albumen.—To the white of six fresh eggs, or six ounces, add —

Water	1½ ounces.
Liquor ammonia	1 drachm.
Iodide potassium	½ "
Bromide	6 grains.

A bit of lump sugar, say 2 drachms weight.

Beat all up for twenty minutes, or until it will froth up no more — this is best done with a bunch of a dozen quills, a table fork must not be used. Let stand all night, and filter through sponge into a bottle; put a bit of camphor to it, and a little collodion round the cork, and it will keep any time.

Developer.

Saturated solution of gallic acid. This developer is best for beginners.	or	Pyrogallic... 2 grains. Water ...... 1 ounce. Glacial acetic, 20 drops.

Fix with hyposulphate of soda.

For the bath take —

Distilled water	1 ounce.
Nitrate of silver	40 grains.
Glacial acetic acid	30 minims.

Before commencing to prepare the plates, rinse out a glass measure with a lip to it — dont wipe it with a cloth at all — pour off two or three ounces of albumen into it, and have another vessel ready to pour the albumen off the plate into, as it should not be poured back into the same vessel, or it will create bubbles, which the operator will find awkward to get off the plate. Line the kitchen oven with paper, and on the bottom put a clean cloth for the plates to stand on, and proceed as follows:—Before coating with collodion, WARM THE PLATE SLIGHTLY (let those who practice this method, and who are mortified by seeing their good negatives ruined by blistering, take particular notice of this) and coat with collodion, allowing *it to set well*, say half a minute, then sensitise in either the ordinary bath or in the aceto-nitrate; I use the latter, making one bath do for both purposes — sensitising the collodion and albumen film. I take care to keep the bath clear by means of kaolin — or what will suit as well, I find, *fuller's earth* — and perhaps this is a fact worth knowing, as the former article is sometimes difficult to obtain. Take the plate out of the bath and wash for half a minute under a strong stream of water from a tap. This plan of washing I find far superior to the old plan of washing in bowls. By the latter plan the negatives generally were filled with innumerable specks or holes in the high lights and skies; by the former mode this is entirely obviated. Allow the plate to drain on blotting-paper or a clean rag of any sort, while you proceed with another plate, and by the time this is put into the bath, the former plate will be ready for coating with albumen, as follows:—Pour on, say a quarter of an ounce, and let it run all round the plate, pour off into a separate glass, repeat this with a fresh dose, and put the plate in the oven to dry. Mind no dust comes near it now. The albumen may, after all is done, be put back in the bottle again with a little camphor, and may be used over again two or three times. By systematic working eighteen plates may be prepared in one hour, which I should think quick enough for anything, besides the advantage that these plates, after coming out of the oven, will remain good for any length of time, provided they are kept dry. I have no doubt they will keep for years. The only thing to be done next is, when the plates are cold, to dip them into the bath again for one minute, and wash under a strong stream from a tap one minute. Well washing here must not be neglected or stains will follow. They may either be dried as before, or spontaneously; I prefer the former. The advantage of these plates to parties going long journeys must be admitted by everyone. They may take out a quantity not sensitised, and should they become exposed to the light it is no matter, and the atmosphere has no effect (except moisture). By taking out sufficient silver and acetic acid they can sensitise their plates the night before they are wanted without any trouble, and are then sure of good plates; but suppose a party (and I have known more than one instance), going abroad for two or three months, and taking a quantity of sensitised plates with him, how many negatives is he *sure* of bringing back with him out of every dozen plates, I should like to know? Or suppose some jealous Custom House officer insists on smashing his plate box open (that has been done, too). Now, if the plates contained in the box were plain collodio-albumen ones, this would not matter, even if opened in strong sunlight; and, as a proof of this, I show you a plate which has been prepared upwards of two months, exposed to strong sunlight before the second immersion in the bath, has been sensitised six weeks, and it is three weeks since I exposed it in the camera; the length of time given was, with 4-inch focus, ¼-inch stop, sunshine, fifty seconds. Perhaps my friend Hooper will develope it for you.

In developing, care must be taken, and for parties who wish to begin the process, I should recommend them to use the gallic acid as a developer, adding three or four drops of 20 grain solution of silver. I use the pyrogallic generally, because it saves time; with that I can develope my picture in ten minutes. I would also warn beginners not to *over-develope* their negatives; I have seen many a good picture developed to such an extent as to be useless for printing purposes. There is a difficulty, especially to beginners, in judging by candle-light the exact time to stop the action of the developer. Now this plan will be found a good one. Develop till the detail in the shadows are well out, and then fix with hypo.; next day, by daylight, the negative may be brought up to the proper amount of density, and if the exposure has been right a good picture no doubt will be the result. With respect to the exposure in the camera, this so much depends on the quality of lens, the light and nature of the object, that I shall leave beginners to find this out for themselves. I have frequently heard it stated that thin skies are the result of over-exposure. This is quite a mistake. A great deal has been said about the trouble connected with this

process. Now, sir, I find *it the easiest* process to work. There is not that exact amount of care required in washing—you cannot over wash the plates; if you want to prepare a quantity of plates in a hurry, you have not to run for this or that collodion—any will do; and if you have not used your bath for months, and don't know its condition, it does not matter. The great thing to be observed to ensure success is plenty of washing after the last sensitising, attention to the amount of exposure, and care in the developing. Should stains appear on the surface, they can easily be removed by means of a little cotton wool.

Fothergill's Process.

I have adopted the following method in treating these plates. Keen's collodion neutral bath, saturated with iodide is the usual way. In washing I have found it the safest way to dip the plate into a solution of nitrate of silver, say 10 or 12 grains to the ounce. The four drachm washing gives, perhaps, rather quicker results, but not much so; and unless the greatest amount of care is taken, peculiar markings in the negative are sure to take place. If the four drachm method be adopted, it is certainly adviseable not to use the same water twice over, but to pour on an equal quantity of distilled water on each plate fresh. The simplest and best method of preparing these plates, I think, was given in one of the journals some time since by an Edinburgh gentleman, I believe his name was Bell. His formulæ I tried, and found it to answer well; as also that recommended by him for making a collodion for this process, which I found to answer quite as well as Keen's. Perhaps, should this catch his eye, he will favour the public once more with his paper—to those who practice this process it would no doubt be of service. The plates, after albumenising, I allowed to dry spontaneously, and afterwards placed them in a hot oven. The developer used was the ordinary pyrogallic.

Dr. Hill Norris's.

I will glance over the method adopted by me in this process, if I am not taking up too much of your time. Any good negative collodion will do, but it should not be *new*, or sufficient amount of density will not be obtained. After sensitising in the usual way, I wash well the plates, and *immerse* in the gelatine, prepared exactly according to Dr. Hill Norris's formulæ, allowing the plate to remain in this a few minutes. It is then taken out and dried in a warm oven. The only difficulty I have met with in this process is that the film is liable to become detached. This, I have no doubt, depends much on the kind of collodion used; a tough one being the best, as it adheres more firmly to the glass. Great care must be observed in the developement, as should stains take place the film will not bear touching. The developer used for this process is the ordinary pyro-gallic. Fix with either hypo. or cyanide.

In conclusion, I beg to call your attention to a print which has been treated as follows:—The ordinary albumenised paper floated on the *back* on the solution of gutta percha, recommended some time since—the print was washed *five minutes only*, and has been printed nine months, constantly exposed to light. I merely wish to call your attention to the whites in the picture (not many certainly), but considering the amount of washing and the careless way in which it was done, I think it says a good deal for the gutta percha plan.

NOTE ON PHOTOGRAPHING IN THE PYRENEES.

By M. Civiale, fils.

During an excursion to the Pyrenees I obtained two panoramas of the mountains and some views in detail of the rocks and cliffs, which it appears to me may present some interest in a geological and geodesical point of view.

The first panorama, consisting of four proofs, represents a portion of the chain of the Pyrenees, French and Spanish, taken from the Antecade, near Luchon, at a station 6600 feet above the level of the sea. This panorama, comprised within an angle of less than sixty degrees, forms the sixth part of a cylinder, the diameter of whose base is 13,300 feet. The horizontal plane of this base is 4330 feet above the sea-level, and extends from the south-east to the south-west. I focussed upon the mountains, distant about 5000 feet from the camera, so as to bring in distinctly the most distant objects.

The second panorama, composed of three proofs, represents a view of the Maladetta and its glaciers, taken from Venasque, near Luchon. This station is 7660 feet above the level of the sea. This panorama, comprised within an angle of thirty degrees, is a plain. I focussed upon a point about 12,000 feet from the camera. All the distances and measurements of angles are only approximative.

The points from which panoramic views can be taken are not numerous, and are often of difficult access. The photographer is almost always obliged to work under conditions of distance and orientation, which are detrimental to the effect of the panorama he desires to take.

The other views are details of mountains, the chaotic rocks of Gedne, and the cliffs of Saint Jean de Luz. The negatives were taken on dry waxed paper, by a modified process of my own, and with an instrument as portable as could be made. This indication of the manner in which the proofs have been taken will, I think, show what can be obtained in the way of pictorial illustration of the general arrangement of mountain-chains, their forms, fissures, and their glaciers. We can also determine approximatively, from heights already known, the heights of peaks of very difficult access. The heights already calculated will give with the maps the approximative distance from the camera to vertical lines passing through their different summits; measuring the vertical angles of these summits, direct from the station-point, we obtain the approximative heights, by multiplying the line of the base by the line of the vertical angle.

$$h = \mathrm{A\,B} \sin. a.$$

We can also obtain details of the rocks, of natural sections of the glaciers, fissures, cliffs, &c. Lastly, the comparison of the panoramas of mountains obtained by photography with existing maps, will enable us to rectify certain inaccuracies which have crept into these maps.

DECOMPOSITION OF THE OXALATE OF LIME BY NITRATE OF SILVER.

By M. E. Chevreul.

In the work upon proximate organic analysis, to which I have devoted so many long years of study, I am obliged to distinguish as much as possible, by a series of experiments, the nature of each of the species of proximate principles which I have succeeded in isolating from each other, instead of confining myself to deducing this nature from the action of a simple reagent. It is in conformity with this manner of operating that I am able to assert the existence of *oxalate of lime* in the fat of the sheep and the alpaca. But the process I employed was tedious, since it consisted at first in reducing this salt, by means of sub-carbonate of potash, into sub-carbonate of lime and oxalate of potash; then in reducing this latter into nitrate of potash and oxalate of lead; and lastly, in decomposing the oxalate of lead by hydrosulphuric acid. A much more simple process, which I practice now, consists in converting the oxalate of lime into nitrate of lime, and into oxalate of silver, by means of nitrate of silver previously fused, then dissolved in water.

To one part of oxalate of lime, dried at 104 degrees F., and representing two atoms of water, put 2·07 parts of fused nitrate of silver and twenty parts of water. A reaction of from one to three hours, at a temperature of about 212 degrees F., suffices to decompose several drachms of oxalate; and a trituration of a few minutes' duration of several grains of oxalate of lime in the water containing nitrate of silver, suffices to effect the conversion of the latter into oxalate. The oxalate of silver, once obtained and well washed, touched with very weak hydrochloric acid, is reduced into insoluble chloride and into oxalic acid, easily obtained in a crystalline form from the water holding it in solution.

M. NIEPCE DE SAINT VICTOR'S RESEARCHES.

Distinction between the action of Heat and of Light upon the Salts of Silver.

The experiments of M. Nièpce being of so much importance in a scientific point of view, they have naturally attracted the attention of a great many inquiring minds, who have undertaken either to verify them, or to prove what value they really possess. Amongst others, and not the least in importance, are the investigations recently carried on in the laboratory of the eminent chemist Thenard, by M. M. Ed. Bouilhen, and A. Sauvage, in which the experiments of M. Nièpce were repeated with the most scrupulous care and minuteness. The result is as unexpected as it is important. For the results obtained by solarised tubes, attributed on the one hand to the action of heat, and on the other, to the action of light, are due to neither one nor the other, as will be proved in the sequel.

When a tube containing a piece of solarised cardboard, which has been impregnated with nitrate of uranium is opened in the dark, and a piece of paper coated with nitrate of silver is placed upon it, at the expiration of a couple of hours a very sensible reduction is produced on the portion corresponding with the open-

ing of the tube. If some drops of distilled water are previously placed in the tube, the reduction takes place more rapidly; if the temperature is about 176 F. it is effected in about ten or twelve minutes.

If the dry tube be warmed, the action is quicker than when it is cold, but slower than when the tube contains water.

On the other hand, if paper impregnated with nitrate of silver be exposed directly to the action of the vapour of distilled water, the reduction is effected in fifteen or twenty minutes.

Positive paper, which contains an excess of nitrate of silver, gives the same results.

The conclusion from these facts is as follows:—In the first experiment, there exists an action which is accelerated by the vapour of water, and in the second, that the vapour of water alone will cause similar reductions.

Having arrived at this point, the next step that suggested itself was to submit to solarised tubes papers impregnated with salts, irreducible by heat, in presence of an organic body, experimenting as follows:—

A paper imbued with pure chloride of silver, placed upon a solarised tube, a very strong reduction was obtained in about twelve hours. Pure iodide of silver and bichromate of potass gave the same results.

Although these experiments were very conclusive, it was desirable to corroborate them and render them indisputable. Therefore five pieces of paper were taken, washed with distilled water, and then imbued—the first with nitrate of silver; the second with chloride and nitrate of silver; the third with pure nitrate of silver; the fourth with pure iodide of silver; and the fifth with bichromate of potass: they were placed upon a plate of copper, warmed upon a water bath. At the expiration of ten minutes, two papers only were impressed; that imbued with nitrate of silver and that with chloride and nitrate. The others, although heated for an hour, gave not the least trace of reduction.

By this experiment it is evident that the action produced by the solarised tubes upon the sensitive papers is not caused by heat. Nor is it due to the light supposed to be absorbed and stored up in the paper. For if between the tube and the sensitised paper a thin plate of glass is interposed, no reduction takes place, even after ninety-six hours contact.

In fact, the reduction of a sensitised paper, submitted to the action of a solarised tube, is due neither to heat nor a stored-up light, but rather to a peculiar volatile substance, which is developed when certain acids and salts are submitted to the action of light in presence of an organic body.

From researches specially directed to this object for some time past, it is expected that this body, or this very reducible silver, will soon be made known, at least in its properties.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held on Tuesday, the 3rd instant, Roger Fenton, Esq., Vice-President in the chair.

The minutes of the last meeting were read and confirmed, Mr. Malone having first asked whether the gentlemen he had recommended to be added to the collodion committee had been summoned. He was informed that they had, but that Mr. Heisch had declined to attend.

Henry Jenks, Esq., was duly elected a member of the Society.

Mr. Mayall then read a paper upon a *New Collodion for Field Work*. [See page 118.]

A pause ensued and the chairman called upon Mr. Hardwich.

Mr. Hardwich said he had hoped that some other gentleman would have taken the initiative; he had received some of the collodion described from Mr. Mayall, and tested it, and was bound to confess his favourable impression, although there were some points which he thought might be altered with advantage. He could not agree with Mr. Mayall as to his pyroxyline, and had mentioned to that gentleman the impossibility of obtaining blotting paper of an uniform character, there being a great variety even in the same ream. He (Mr. H.) believed that nothing but cotton wool, of the best quality, will make uniform pyroxyline. Another point (a most interesting one) was the mixture of iodide and bromide of magnesium instead of those of potassium, sodium, or ammonium. A gentleman had in the last number of the Society's Journal suggested the use of iodide of calcium instead of iodide of potassium, but had been in the habit of using it in conjunction with the bromide of calcium, therefore we are not sure that the favourable results in Mr. Mayall's case may not be due to the association of iodides and bromides, instead of to the bases; for it was well known that one great advantage in the addition of a bromide was that the collodion did not so rapidly change after sensitising. Mr. Heisch had pointed that out, and he had examined the point very carefully, therefore he asked Mr. Mayall whether he was prepared to say positively that the same amount of stability might not be obtained from the use of the iodide or bromide of any of the alkaloids, instead of the magnesium compounds, for it appeared that the manufacturing of the iodide of magnesium must be a difficult process.

The advantages of the iodide of potassium were known, and the iodide of cadmium was most satisfactory; because, after purchasing them and applying chemical tests, they were found to be pure and good. Mr. H. had experimented with a view of suggesting a ready mode of preparing iodide of magnesium in the laboratory, and it occurred to him that if he mixed solutions in atomic proportions of iodide of potassium and sulphate of magnesia, then evaporated to the crystallising point, and digested the crystals in absolute alcohol, it would leave behind the sulphate of potash.

He had made the experiment, and evaporated the crystals to dry ness, but found the last portion of water driven off with great difficulty, and vapours of hydrychloric acid escape. Upon treating the result with alcohol, he obtained very readily iodide and bromide of magnesium, which he dissolved in collodion, but he could not make that collodion work at all well, and the only idea which occurred to his mind at the moment was, that a decomposition of the iodide ensued in the heating, and had some fatal effect. Mr. H. made a considerable quantity of iodide and bromide of magnesium as he had thought quite pure, but when he came to test it with collodion it would not work.

If iodide of magnesium were prepared by chemists, how were they to make it in a way to ensure its purity? He thought the best thing would be, to establish careful experiments to make sure whether iodide of magnesium has any decided advantage over iodide of ammonium. Mr. H. had examined Mr. Mayall's collodion very carefully, testing its sensitiveness on a very dull day, with an uniform light, and found it more sensitive than collodion prepared with iodide of potassium only. Mr. Mayall said that the bath should contain forty grains to the ounce, which was a decided advantage for portraits, as he obtained very excellent intensity on a fine day with it, but afterwards on trying it for landscapes he found the skies metallic and weak.

Mr. H. rather inclined to the idea at that time that in the hands of the amateur it was not a collodion very easily brought up to the proper printing point for landscapes. Those who worked last week knew what the character of the light was with the strong east wind. The pictures taken then were very weak indeed.

Mr. H. then suggested that some plain, suitable, satisfactory, uniform collodion should be made and tried with different kinds of iodisers, some containing bromide and some only iodide. If any one wished to go abroad to a hot country, by all means let him provide himself with a mixture of iodide and bromide, and he knew that the mixture of iodide and bromide of ammonium had answered well after being taken in alcoholic solution to Australia.

He did not imagine that the bromides would supersede the iodide, or that Mr. Mayall's collodion would ever supersede the ordinary collodion, nor did he agree with Mr. M. in his assertion that the subject of pyroxyline was worn out, for he (Mr. H.) thought it the very essence of the experiment. Notwithstanding the solarisation of which some complained, he thought that the use of bromide was the key to the half tones; but, while adopting Mr. Mayall's other suggestions, cotton-wool should be used for the pyroxyline, and not the ever varying blotting paper.

Mr. Sebastian Davis had prepared collodion, and sensitised it in different ways, but with one he had observed the singular fact, that after keeping it some time, the colour at first apparent afterwards disappeared—the free iodine seemed to be absorbed; and the reason as he thought was the introduction of a certain quantity of bromide of ammonium. The quantity he introduced was small.

If he used iodide of potassium to sensitise the plain collodion there was too much intensity, in whatever manner the pyroxyline might be made—that is to say, he did not get that amount of middle tint which was absolutely necessary for a perfect picture.

He found in practice that the employment of iodide of potassium in combination with iodide of cadmium gives a satisfactory result, and theoretically arrived at this conclusion. Iodide of potassium however, properly prepared, is not neutral, but slightly *alkaline*, while iodide of cadmium in its pure state has an *acid* reaction, and the two together produce a neutral mixture. In introducing

bromides it was recommended at one time to unite them with iodides in equal proportions, but his observations led him to the conclusion that so large a quantity of bromide tamed down the pictures to too great an extent; he found the most advantageous proportions were about—

$4\frac{1}{2}$ grains of iodide of cadmium,
1 grain of iodide of potassium,
$\frac{1}{2}$ grain of bromide of ammonium.

He particularly mentioned bromide of ammonium, because it was more soluble in alcohol and ether: by mixing in the above proportions with collodion it had, after two or three weeks, become as colourless as water. He remarked there was a collodion which was well known, and is now largely used by some of our eminent photographers, which collodion contains iodide of cadmium, and that was perfectly colourless. As it is a mercantile article he did not otherwise refer to it than by saying it was equal to any in the market for keeping qualities.

With regard to the use of sulphuric acid in the making of pyroxyline, he thought it advisable to obtain the strongest. He had been in communication with one of the largest manufacturers of the article for the purpose of procuring an uniform sulphuric acid, and found that sulphuric acid of specific gravity 1·850 was really purer than that of specific gravity 1·840. A weaker nitric acid is more advantageous, say of the specific gravity of 1·45, as suggested by Mr. Mayall, and as a certain amount of water was added by photographers to the acid mixture, it appeared unnecessary to obtain an acid of very high specific gravity.

Mr. John Williams thought it possible to produce pure bromide of magnesium. He had opportunities of becoming acquainted with the subject: he prepared, first, iodide of iron; to that in a boiling state he added caustic magnesia, until the solution when filtered no longer became black on adding solution of hydrosulphate of ammonia; he then washed it and allowed it to stand twenty-four hours, during which time the excess of magnesia dissolved by the iodide of magnesium becomes carbonated, by absorbing carbonic acid from the atmosphere, and by that time carbonate of magnesia was formed and precipitated; he then evaporated the solution to crystallise, and brought the crystals to absolute dryness in a vacuum, as the operation could not be performed in the open air. The substance formed, if not *pure* iodide of magnesium, is a substance which photographers could use, and is as properly called so as the iodide of ammonium, of calcium, or any of the other iodides used by photographers.

Mr. Mayall had mentioned nitr*ous* acid, a rather indefinite term; pure nitrous acid could not be produced; the nitrous acid of commerce contains chlorine, sulphuric acid, and nitric acid in varying proportions. Sulphuric acid of the specific gravity of 1·84 is, perhaps, that which will keep best.

Mr. Shadbolt found one objection to the use of paper in the manufacture of pyroxyline, viz., that in all samples of bibulous paper that he had used he found a small portion of starch introduced to give it a body.

The developer which Mr. Mayall recommended was an old developer, used, if he recollected correctly, by Martens, of Paris — at any rate he had a manuscript of formulæ in his possession for the last five or six years in which that particular formulæ mentioned by Mr. Mayall appeared.

A remark had been made upon the use of bromides and iodides in combination. At a soiree held recently at the Mansion House he had very carefully examined some specimens by Mr. Heisch, being photographs of red and white camellias and green leaves, in which the various gradations of tone for all the colours were exquisitely preserved: they were taken with collodion containing two equivalents of an iodide for one equivalent of a bromide, by which the details of light and shade in the red and white camellias and in the green leaves were rendered in the most perfect manner possible, and with as perfect a gradation of tone as any photographs he (Mr. Shadbolt) had ever seen. That fact appeared to augur well for the use of the combination of iodide and bromide, where the colours to be taken were violently contrasted.

Mr. Shadbolt had also a question to ask Mr. Mayall: — how could the presence of magnesium in the collodion prevent the absorption by it of water, the salts of magnesium being so greedy of water?

Mr. Malone said that Mr. Mayall told them last meeting "that he had a horror of mixtures," but he had now departed from this fundamental principle. Mr. Malone long ago thought that a very simple collodion, prepared by the Count de Montizon from cotton wool, was the best. He perfectly agreed with Mr. Hardwich in the importance of beginning by studying fully the nature of the pyroxyline. Mr. Murray, he believed, was the first to suggest the use of paper, and it was taken up immediately by Mr. Crookes and others. Mr. Murray used what is called nitrous acid, and although these points had been frequently discussed, he still thought the whole chemistry of the subject required investigation. The objection with regard to paper in the manufacture of pyroxyline was this—that one cannot rely upon having the same substance in paper made even at the same mill, with what would be alleged to be the same materials. In the course of his experiments with Mr. Talbot he spent a fortnight in one of the paper mills, and he found that, unless the whole history of paper were known from the beginning to the end, one could not be sure whether it might not consist of a mixture of linen and cotton in varying proportions; but granting that it might consist of cotton only, even then it might be of new materials or perfectly worn out ones, and if so the result would vary. By using cotton wool you may make collodion as sensitive and as good as any with which we are now dealing. One gentleman had said that it was difficult to get acid of specific gravity, 1.45; but he agreed with Mr. Williams that that was the purest acid in the market—it is prepared by a well-known maker for the assayers, and we are not to conclude that taking a weaker acid, say specific gravity 1.20, it shall be equal to the other with the addition of water.

He (Mr. M.) had been told by a gentleman in the trade that he was satisfied that there was some reason for what the late Mr. Murray had suggested, viz., the mixture of nitrous and sulphuric acids—nitrous acid being the *omnium gatherum* of the acid manufacturer—any old rubbish being put into a bottle and sent out as nitrous acid, and although we were pouring contempt upon this acid, there might be something in its use.

It might be remarked that it was of an orange-red colour—the lower oxides of nitrogen were liberated and absorbed, and after all we ought perhaps to use a mixture of nitric and nitr*ous* acids, and not to attempt to isolate nitrous acid, for in fact we may get hyponitrous acid, which would undoubtedly be a more powerful oxidising agent. Dr. Paris has demonstrated by his delicate starch test, that *pure* nitric acid will not decompose iodide of potassium, showing how different the modifications of nitrous oxides were, and it might be that the mixture of nitric and nitrous acids operated differently on the cotton; he made these remarks to show how very far the subject was from being exhausted.

He might mention that, upon speaking on the subject not long since to Dr. Hoffman, under whose instruction Mr. Malone had studied chemistry, the Dr. had stated that there were five chemical varieties of pyroxyline, and until you ascertained clearly which of those five varieties you were dealing with, no certain result could be produced. Backed by such an authority, he said photographers were at sea upon the whole subject.

Mr. Hardwich said, as Mr. Williams had been good enough to give some information upon the manufacture of iodide of magnesium, he would ask him whether it could be obtained sufficiently dry to be weighed in the scale?

Mr. Mayall exhibited some iodide of magnesium in the required state.

Mr. Hardwich asked how it would keep in alcoholic solution.

Mr. Mayall said very well.

Mr. Hardwich asked whether it could be obtained white instead of highly-coloured like the specimen before him.

Mr. Mayall said that it was white when it was newly made.

Mr. John Williams stated that two or three months since he received twenty-four Winchester quarts of "bottoms" of old iodised collodion from a large manufacturer, for the purpose of saving the ether. Of course it was withdrawn in the usual manner—the residuum was examined and washed to save the iodides present, and upon examining it there was found to be in addition *one pound and five ounces of oxalate of lime*, which was a very unexpected result. Of course it could be seen where the oxalic acid came from, and the collodion must have contained a large quantity of it.

Mr. Hardwich asked whether the change might not have taken place during the distillation of the ether.

Mr. John Williams said it was impossible; he had since tested for it newly-made collodion, there was abundance of oxalic acid in ordinary collodion; he thought the oxalic acid was formed during the process of making the pyroxyline. The collodion was not of Mr. Williams's own manufacture.

Mr. Malone said that sulphuric acid acting upon rags formed a sugar, but in washing the pyroxyline the oxalic acid ought to be washed out by the use of distilled water. If ordinary water containing lime were used it would produce oxalate of lime.

Mr. John Williams said that might be the case, but he should almost imagine that the oxalate of lime would not dissolve in the collodion, but being contained either in the fibre or in the paper it would not be washed out of the pyroxyline.

Mr. Hardwich thought that Mr. Williams's statement was one of very great interest, and it appeared almost impossible that that quantity of oxalic acid could have existed in the collodion. He (Mr. H.) thought that oxalic acid was really formed by aid of the iodide of potassium when distillation was taking place. He could imagine, if iodide of potassium were heated with collodion, that under the influence of the heat the alkaline iodide might bring about decomposition of the pyroxyline. It was a most extraordinary thing, and he could not understand that the oxalic acid was produced in the original manufacture of the gun-cotton; he thought the subject could be pursued further with advantage.

Mr. Mayall stated that he could confirm Mr. Williams in the statement relating to oxalic acid. He (Mr. Mayall), had very frequently discovered it in an old collodion by precipitating it with lime and examining it with the usual tests. That was one of the reasons why he adopted the magnesium in the first instance, for if there were any oxalic acid formed it would be precipitated, and as he now sensitised one or two gallons at a time, he frequently found a very thin film at the bottom of the bottle of white precipitate, which is no doubt a precipitate of that kind, that is, an oxalate of magnesia, or some oxalate of the family; if there were any lime present in the magnesium it would be an oxalate of lime — however, that was a very important fact, and he had no doubt it was one of the clues to the removal of their obscure difficulties, and if no other fact were elicited than that, their time would have been well bestowed in attending the discussion. However, as Mr. Malone had reminded him of an observation he made at the last meeting upon his horror of mixtures, he must deny that what he recommended was a mixture more than was necessary, but was scientifically the best of its kind with which he was acquainted. He thought he might venture to speak from his experience of collodion, having been engaged with it since it was first discovered by Archer, and from the time he (Mr. M.) took his first lessons upon the subject from Dr. Diamond, which he believed was in May, 1851; and he had from that time to the present made nearly all the collodion that he had used: he made it also with the desire that he should each time comprehend some of the difficulties of which he heard others complain and which in the early days of his experience he almost found insurmountable. However, through good report and evil report, and notwithstanding the denunciation of paper, he had adhered to paper the whole of that time; and could only say that whenever he had made a mixture of half paper and half cotton, he had invariably made a finer collodion, flowing more easily over the glass, leaving no reticulation, and adhering better to the glass than when cotton only was used.

He knew Mr. Hardwich in his work recommended an immense quantity of water, and although he (Mr. M.) thought it a useful receipe, he very much doubted whether so large a quantity of water were the best, because he was obliged to use a very large quantity of sulphuric acid to absorb that quantity of water; and although it might act upon the cotton so as to disintegrate it somewhat, he should hesitate in employing that formula, because with it he got a powdery collodion, and consequently a rotten film.

He might state that the blotting paper of which he had shown a specimen was Whatman's prepared blotting; it was the same that is used by the old calotypists; he thought he had used it since 1846; he had never had any difficulty in getting the same quality of pyroxline, either from an old ream that he had purchased years since, or a recent one, which he had obtained lately; he bought it in St. James's Street. They would find that if they took one bundle of cotton and tried to make a batch of pyroxyline with it they would succeed, but from another sample of cotton they would not, and in his opinion there was more difficulty with the cotton than with the paper. They would find that if they made six or seven "brews" of collodion, take one and try it alone, what would be the consequence? They might get a collodion that had perhaps great intensity; if they took another it might produce exquisite detail; another might be tenacious; a fourth powdery; but mix them all together and the whole would be better than either. He would ask, what was that but the same thing as making paper?

Mr. Malone ejaculated, "Never twice alike."

Mr. Mayall must confess, at all events, that the manufacture of *that* paper was very carfully attended to, and he had no hesitation in saying that he could produce a collodion with it which he could work better than any other collodion that he had tried, therefore he should not be beaten out of the opinion that it was good, simply because other gentlemen had *not* succeeded while he had uniformly done so, and he did not recollect a single failure when he had used paper with the proportions and the acids he had named.

In what he had called nitrous acid he knew that there was a large quantity of nitrous oxide. Mr. Hardwich recommended nit*ric* acid— he (Mr. M.) thought there was a great deal of difficulty in using it, and that Mr. Malone's opinion would be found to be correct, viz.— that there were a quantity of lower oxides of nitrogen dissolved in this red fuming nitrous acid, and they were not to take it for granted that it was the refuse of some manufacturer that happened to have an *omnium gatherum* bottle in some dark corner into which he casts all his refuse: however, whatever might be said to the contrary, he recommended that as the acid with which he was successful, and it was the acid with which every one might succeed who tried.

The next thing was Mr. Shadbolt's most important question. He had asked how it was that the salt of magnesium (which was itself so deliquescent) should have the power of preventing the collodion from becoming humid? They all knew that the ordinary collodion contained a large quantity of water — in fact, if they had a very highly concentrated alcohol they could not dissolve enough of iodide of potassium, therefore a small quantity of water must be added; but if common alcohol and common ether were used, they would have in the sensitising compound of iodide and bromide of magnesium, an absorbent of moisture, as they themselves take up six or seven volumes of water to one of salt, without deteriorating (because that was the point); but was that the case with the iodide of ammonium or iodide of potassium? Nothing of the kind; for the moment we add iodide of potassium or iodide of ammonium, a decomposition is set up, hydriodic acid is formed, and the collodion becomes of a pale yellow colour, then red, and finally not capable of being used at all (simply because it, either the ether or the alcohol, had dissolved a quantity of water), and the image became consequently feeble; but one could continue working with these magnesium-excited collodions to a very large extent, one of the advantages being, that if he took a bottle of it sensitised a month ago, another bottle sensitised six months since, and one sensitised two years back, they would all produce precisely the same kind of image. Whether it be the cloudiest weather in winter or the hottest and finest day in summer, the same kind of image would be produced by the different samples; and he asked the gentlemen who had spoken on the subject if they could say the same of any one of the collodions which they knew or recommended — that was the point to be discussed. He had no object in view but the greater perfection of the art—in fact every one imbued with a true feeling for their beautiful art must desire that it should be freed from every possible error that surrounds it.

Mr. Hardwich had made some very important observations — in fact anything that Mr. Hardwich said was always received by the Society as of very great weight, because he had paid a great deal of attention to the subject, and brought an immense amount of scientific information to bear upon it. He wished some of the gentlemen who had time would take the matter up. It was well worth their attention, inasmuch as they could go out into the country under every possible condition of weather and produce a *tolerable* image, and if they used great care they could produce an image which in his opinion could not be surpassed by any other. The uniformity of the production was that which he insisted upon, and he did not think he could say the same of any other sensitiser with which he was acquainted, except iodide of cadmium, which, however, produces a ropy collodion that does not spread readily after the lapse of time, on being frequently poured over the plate and back to the bottle.

Any one could obtain the salt most carefully prepared by Mr. Williams. The salt that gentleman had prepared for Mr. Mayall had worked in the most satisfactory manner, and he had no doubt that many who go forth into the country and come back with smeared plates, very dirty hands, and not many results in the shape of pictures, would go into the country with this collodion and bring back good results, many of them very superior, and have scarcely any failure.

He gave a friend from the West Indies two or three bottles of this collodion, which he took abroad, and a letter had since been received by Mr. Mayall, stating that the collodion was in exactly the same condition as at first, and worked well in that climate. He had also received a letter from the icy regions of Canada which said the same, so that he did not think the theorist should put down a thing that was new until it had been fairly tried.

He offered to assist any gentleman who would take up the matter practically, and stated that as he believed the Chairman was about

to commence a series of experiments upon the subject, he hoped that in November they would be enabled to have some evidence that the magnesium collodion was not a myth, but something which they could all take hold of, and by which they could produce results of which none need be ashamed.

The CHAIRMAN made some pertinent remarks upon the value of the society and such discussions as the present. He then stated his opinion in favour of the combination of bromide and iodide, but that with potassium and salts there was the difficulty that it was almost always settling down in crystals at the bottom of the bottle; whether that arose from defective manipulation or want of knowledge he did not know, and he was always afraid to use collodion with large quantities of iodide of potassium in it.

In following the directions which had been kindly given to him by gentlemen making the theory a study, he had produced a great many bad pictures, more than he would have done if he had followed on in the use of the simple collodion with iodide of ammonium or any iodide easily soluble with the bromides; that of ammonium he had found the most easily worked, the most uniform in its results, and least affected by variation of temperature or climate. All that he had learned he had learned by constant failures, with occasionally here and there a success; and if the method of producing the collodion described to the meeting should prove to be satisfactory, or if Mr. Hardwich, or any of the gentlemen who experimented upon the subject again, would point out a better, the members of the society would, as humble disciples, thank them for their information.

After some remarks from Mr. Malone, who misunderstood the chairman to have undervalued the labours of the scientific section of photographers, which was denied by Mr. Fenton, the meeting was adjourned to Tuesday, 7th June.

Messrs. MURRAY and HEATH exhibited some apparatus described in our last; and the Rev. T. M. RAVEN a proof from a waxed-paper negative, it being the prize picture of the exhibition held in Edinburgh lately. Though very artistic, it was decidedly deficient in detail as compared with good proofs from glass negatives.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

A meeting was held on Monday evening, the 10th instant, at the rooms of the Walworth Literary and Scientific Institution, to organise the foundation of the above-named Society.

Mr. WALL being voted to the chair, proceeded to explain the motives which induced him to convene the meeting, and to state for discussion his views with regard to the proposed Society, which he thought ought to be established in connection with those in the rooms of which the meeting was held.

Mr. SHADBOLT proposed, and Mr. HERVE seconded—

That the present meeting constitute the South London Photographic Society as an independent body; that the subscription be half-a-guinea annually, but to the members of the Walworth Literary and Scientific Institution, only six shillings annually.

After a short discussion Mr. Shadbolt's motion was carried.

Mr. ACKLAND then proposed—

That this Society hold monthly meetings (with a recess), to read papers upon photographic matters, and discuss the same—to organise an Exchange Club—to supply each member with a Photographic Journal periodically, as published, and to present a photograph to each member annually, as soon as the number of members joining should provide sufficient for the purpose.

Mr. HOWARD having seconded this motion it was carried.

Mr. HOOD proposed, and Mr. ACKLAND seconded—

That this Society hold eight or nine meetings in the course of the year, and that ten shillings per evening be offered for the use of a large room, adjoining the Lecture Hall of the Walworth Literary Institution, in which such meetings be held, on the Second Thursdays of the months during the Session, provided that such resolution be confirmed at the next meeting of the Society.

Carried.

Mr. HOWARD proposed, and Mr. LEAKE seconded—

That the First Public Meeting be held on the Second Thursday in June next, in the large room adjoining the Lecture Hall.

Carried.

Mr. ARMSTRONG proposed, and Mr. HOOD seconded—

That Ladies be eligible to become members of this Society.

Carried.

Mr. ARMSTRONG proposed, and Mr. SHADBOLT seconded—

That the following gentlemen be appointed a *Provisional Committee*, to undertake the necessary proceedings consequent upon the formation of the Society, viz.:—Mr. Wall, Mr. Cotton, Mr. Hervé, Mr. Ackland, Mr. Howard, and Mr. Leake.

After some interesting and pleasant conversation relative to the views and objects of the Society just formed, the meeting was adjourned.

Ladies and gentlemen desirous of joining the Society are requested to communicate with Mr. A. H. Wall, 90, Cannon Street West, City.

LIVERPOOL PHOTOGRAPHIC CLUB.

THE ordinary meeting of this Society took place at Mr. Keith's rooms on Tuesday the 5th instant. There was a good attendance of members, and among the visitors was Mr. Holmes, managing director of the Scovill Manufacturing Company, introduced by Mr. Forrest.

Mr. FORREST regretted that he had made no progress with the permanent burning of photographs.

Mr. GLOVER was of opinion that the battery must be laid aside, from the insuperable difficulties in connecting the various insulated parts of most pictures; he would be glad to see some process whereby metallic copper could be deposited by direct chemical and not galvanic action.

Mr. BERRY confirmed this view, and reprobated the use of the battery; though the deepened tone of negatives when subjected to the effect of gold and sulphide of ammonium might give promise of the bold and forcible character of the photograph required, yet it must be borne in mind that all the intensity given by the gold and sulphur was at the expense of the silver, *much* of which was abstracted by this re-action.

Mr. FORREST wished to recall to the recollection of members, the majority of whom could corroborate his statement, that it was unjust to give the credit of taking the first stereoscopic photograph of the moon to Mr. Warren De la Rue, as had been done by the editor of *The Photographic Journal*, in his last number. A large proportion of those present could bear him witness, that so long ago as 1854, he and Mr. MacInnes, after having assisted Mr. Hartnup at the Observatory, had exhibited stereographs of the moon, as well as photographs, upon a disc fifty feet square.

Mr. BERRY presented a remarkable specimen of a photograph, which he held would entirely upset all preconceived opinions upon the phenomena of the calotype. It had been insisted upon on all sides, that the ordinary iodised paper was insensible to the action of light unless combined with free nitrate of silver; now he would exhibit a print that was taken upon paper prepared by the original process of Fox Talbot, and called simple iodised paper, and described by him as wholly insensible to light; this was some he had kept by him fully three months; now, without any subsequent sensitising with nitrate of silver, this had been placed under a negative, and when treated with a solution of pyrogallic acid, strengthened with silver, an exceedingly bold, clear, and distinct image was produced.

Another portion of the same paper, after prolonged exposure to light, was sensitised in the usual aceto-nitrate bath by Mr. Bell, and gave the ordinary calotype negative; thus nothing was gained by this subsequent immersion in the silver, and the latter portions of Mr. Fox Talbot's process were unnecessary.

The Messrs. COOK exhibited some very choice specimens of the turpentine waxed-paper and Fothergill processes, the proofs from which were toned by the formula recommended by Mr. Maxwell Lyte. They were much commended.

Mr. DOYLE showed improved specimens of his peculiar mode of printing.

Mr. HOLMES spoke in very high terms of the superior character of the collodion positives which he had seen in Liverpool, as compared with the American ambrotypes. The most eminent American photographers, he stated, confined their attention to the Daguerreotype and negative collodion processes, the positive process on glass being practised almost solely by those of a lower grade. He also called attention to the attempt of Messrs. Cutting and Bradford to claim by patent the right to the exclusive use of bromides in collodion, a right which will probably be, ere long, contested, as bromides were used in collodion by Mr. Berry,* Mr. Crookes, and others, before the date of their patent.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the evening of the 4th instant, at the rooms of the Literary and Philosophical Society. Mr. Lund in the Chair.

Mr. MANN, the Honorary Secretary, read the following letters to the Society:—

"GENTLEMEN,—At the last meeting of our Society, I claimed for our member, Mr. Dancer, the merit of being *one of the* first to produce microscopic photographs, on account of paragraphs having lately been in the newspapers, claiming for certain parties the invention, and as being something quite new. Mr. Shadbolt, the Editor of *The Photographic Journal*, has replied to my remarks, and calls upon me to give further particulars, as he has always considered himself to be the originator of micro-photographs.

* Messrs. Cutting and Co. date their patent from June, 1853; whereas Mr. Berry lectured on his mode of using bromides in collodion, in April, 1853, at the Royal Institution, Liverpool.

"My remarks are not intended to apply to Mr. Shadbolt, but as he has taken the matter up, I have no option but to reply to his letter: and now claim for Mr. Dancer, not that he was '*one of the first*,' but *the first* who produced these photographs.

"I repeat, then, that I have two specimens of microscopic photographs, given to me by Mr. Dancer, in the spring of 1853; they are mounted with Canada balsam, as microscopic objects, on the ordinary size of microscopic glasses. I may also say that Mr. Dancer at the time informed me how they were taken, and in the autumn of the same year I followed his instructions, and (although not very successfully) I produced some of these minute photographs, and have them still in my possession.

"That there may be no mistake in the dates, I enclose two letters—one from Mr. Dancer, the other from Mr. Binney—confirming my statement.

"*May* 4*th*, 1859." "Joseph Sidebotham.

"*Manchester, May 2nd*, 1859.

"My Dear Sir,—I duly received the letter in which you call my attention to an article on the 'Origin of Microscopic Photographs,' by Mr. Shadbolt, printed at p. 104 of the May number of our Society's Journal; and as Mr. Shadbolt requests you will read his communication to the Society, I must beg as a favour that the members present will listen to the contents of this letter, which shall be as brief as possible, and accept an apology for occupying their time with a matter so purely personal. The question at issue between Mr. Shadbolt and myself is simply this:—Did I produce microscopic photographs before March, 1854? In reply I can state that even on collodion I had produced microscopic photographs in February, 1852; I named these minute pictures, microscopic photographs, and this name I still employ. The word micro-photograph I have no claim to whatever. As the monumental tablet to Mr. Sturgeon was raised in your statement to the Society, and is also alluded to by Mr. Shadbolt, I will confine my remarks more especially to it. The tablet in question was photographed on the 25th April, 1853, and reduced for the microscope early in the following month. Some of the early specimens were presented to E. W. Binney, Esq., F.R.S., F.G.S., &c., of this town; S. Salt, Esq., now of Westport, Ireland; S. W. Williamson, Esq.; A. Neild, Esq.; two of our own members, and yourself. This and other microscopic photographs were well known in this locality long before they had been supplied by me to dealers in such articles; but when they first reached London I cannot say.

"I do not for one moment suppose that Mr. Shadbolt was aware of their existence previous to his own production. To remove all doubt as to the accuracy of the foregoing dates, I enclose a copy of a letter which I have this day received from E. W. Binney, Esq.; this letter relates especially to the tablet in question, and it, in addition to your own testimony, will, I hope (as regards the question of dates), be satisfactory to Mr. Shadbolt.

"I cannot conclude this letter without expressing my great surprise at a statement which appears in Mr. Shadbolt's paper, the substance of which is as follows:—That about March, 1855, Mr. Thornthwaite showed to him a copy of Sturgeon's tablet, which Mr. T. alleged to have procured the production of, in consequence of what Mr. Shadbolt had shown to him. No doubt this has been some misinterpretation, which Mr. Thornthwaite will be able to explain in a satisfactory manner.

"I regret that your friendly feeling should have involved you in this controversy.

"Yours very truly, "J. B. Dancer.

"Joseph Sidebotham, Esq."

"*Manchester, May 2nd*, 1859.

"My Dear Sir,—On referring to my papers I find that it was in April, 1853, when Dr. Joule, F.R.S., myself, and another, got the tablet in memory of our old friend, the late Mr. William Sturgeon, executed by Mr. Latham, sculptor, Manchester. On Saturday, the 23rd of April, I took you to Mr. Latham's place, then in Portland Street, to look at the tablet, and when there, requested you to photograph it for me before it went to Kirby Lonsdale, to be put up in the church. On that same day, Mr Latham, by my orders, took the tablet up to your house in Ardwick. It came back to his place in the early part of the following week, and on Thursday, the 28th of April, it went off to Kirby Lonsdale, and was placed in the inside of the church there. Within a month of the last-named date, in the end of May, 1853, you presented me with a micro-photograph of the tablet, which I received with much gratification and surprise, having expected only a common, and not a micro-photograph from you. I most certainly never gave Mr. Thornthwaite, or any other person, liberty to photograph the tablet; and Mr. Latham assures me that no one but yourself had any opportunity to take a photograph of it prior to its going to Kirby Lonsdale. Believe me to remain, my dear sir, yours truly,

"Edward William Binney.

"J. B. Dancer, Esq., F.R A S., Manchester."

Mr. William Crookes was elected an honorary member of the Society.

The Honorary Secretary stated that Mr. Crookes had sent the volume of the *Photographic News* for presentation to the library of the Society; also a print of his magnified photograph of the Moon, for the Society's portfolio. A vote of thanks was unanimously passed to Mr. Crookes for his presents.

A vulcanised rubber tray, made by Messrs. Macintosh and Co., at the suggestion of Mr. Sidebotham, was shown to the members.

Two large and exceedingly beautiful prints, from collodio-albumen negatives, were presented to the Society's portfolio by Mr. Lund. A very compact exposing camera was exhibited by Mr. Mudd.

Mr. Noton exhibited his contrivance for beating up albumen, and beat up a quantity of albumen in a few minutes into a very solid froth. The apparatus was highly approved of by the members, effecting the object in a most satisfactory manner and with very little trouble. A vote of thanks was unanimously passed to Mr. Noton, for having exhibited the working of the apparatus to the Society.

Mr. Higgins exhibited some sensitised papers which had been kept a month in one of Mr. Mudd's boxes, and which had remained quite white.

Mr. Mudd exhibited one of the boxes contrived by him for the purpose, and explained the same to the members.

Mr. Mabley exhibited some sensitised paper which he had kept white for sixteen days, simply in an ordinary drawer with some chloride of calcium. It was stated that the chloride of calcium would do over and over again, if dried when become damp.

Mr. Mudd said that he intended to make a box for keeping collodio-albumen plates with the aid of chloride of calcium; and it was generally thought by the members that by such a plan the collodio-albumen plates might be preserved longer than it is at present possible to keep them.

Thanks were passed to Mr. Lund for officiating as chairman, and for his donation of the photographs to the Society's portfolio, when the proceedings closed.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The monthly meeting was held on Wednesday last, the 11th instant, at the Chorlton Town Hall,—Mr. Nicholson, Vice-President, in the Chair.

The minutes of the last meeting were read and confirmed. Two new members were elected.

The Chairman said that a former member of the Association, Mr. John Draffin, who had gone to reside at York, had volunteered to send the meeting a paper on *Comparative Experiments on some of the Dry Processes;* and for the feelings of kindness which Mr. Draffin had expressed for the Society he was under an obligation, and so also must every member be, to that gentleman. He should, without further comment, read the paper, only remarking that the Society was not bound by Mr. Draffin's opinions, with some of which he could not coincide with, but he was always glad to hear and discuss an opposite opinion to his own. [For paper, see page 119.]

After reading the paper, the Chairman invited discussion, which he said must be short, as the time of the meeting was so far advanced.

Mr. Hooper was sorry to differ with an old friend, but he thought Mr. Draffin was wrong in stating that Taupenöt's process was more sensitive than Fothergill's. He also could work both processes, and must be allowed to say, that he found Fothergill's the better for other reasons also; and submitted that the prints by Mr. Draffin proved it, particularly the view of York: the Fothergill side was full of detail and half-tone; the Taupenöt side was without detail in the foreground, whilst the developement had been carried so far that the distance was fading away.

Mr. Fawcett had always found Taupenöt's plate less sensitive than Fothergill's, but much easier to manipulate. The more you washed them the better they were, but could never be got by him in the camera as quick as Fothergill's.

Mr. Wardley thought the collodio-albumen the best process. Mr. Draffin's remarks about collodion and the state of the bath were very good—the dark skies in some of the prints might be caused by a very bright sky and a clear atmosphere; then light objects would take lighter than the sky. He mentioned one case where a white lighthouse was clearly defined against the sky in a picture taken by a friend of his. The subject of developement was not sufficiently studied, he thought, A very common notion was, if under exposed, add more nitrate of silver solution; he thought just the opposite—add more pyrogallic, and give time; forcing was bad, and a good negative could not be got by this means.

Mr. Heywood said that about any state of nitrate bath Mr. Draffin and also Mr. Wardley were, he believed, in error. An alkaline bath would not give good negatives by either Taupenöt's or Fothergill's process. A bath of his that was once acid, had been so doctored with kaolin that it became alkaline, and for some time he could not tell the reason; but by making a new bath all came right, and on testing the old one he found it decidedly alkaline.

Mr. Adin wished that a committee could be formed to try the relative merits of the two processes; but it was thought best that a committee should be formed first to arrange what was requisite to be done to test the matter fairly. It was agreed ultimately that it should be deferred.

Mr. Rogerson brought two negatives and some prints, the first productions of an amateur who had just commenced Fothergill's process, to show what could be done at once by that process: the pictures were not faultless, and the gentleman desired that the errors might be pointed out, so that he could remedy them.

Mr. Whaite exhibited a pair of lanthorns for dissolving views, with a new arrangement for dissolving the pictures into each other by a pair of long combs passing over the lens.

A vote of thanks was passed to Mr. Draffin for his interest in the Society, and for his paper.

The thanks of the meeting were given also to the chairman, which concluded the business of the meeting.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER II.

The Utility of Art Knowledge to Photographers.

One of the most important elements of the picturesque is to be found in the skilful management of light and shadow, or what artists term *chiaroscuro*. Certain effects depend entirely upon a careful arrangement of light; for the object of our photograph may stand out in the boldness of relief, or present a tame, flat, unattractive appearance, according to the attention (or want of it) bestowed upon the management of it.

The photographer desirous of excelling in portraiture must give earnest attention to this subject: the light should fall upon the sitter either from the right or left hand (as the aspect of the studio may decide), and not too strongly or too vertically, but so as to give a soft and delicate gradation of shadow from the upper to the lower portion of the face, and from one side to the other. The portion of the face which is in deepest shadow should be relieved with a judicious amount of soft reflected light, to prevent the black opaque shadows, which are so perfectly unnatural that the merest tyro will at once detect the fault.

Proper contrast in light and shade is always so strikingly effective that it deserves the most earnest attention. In lighting the figure of a sitter we should make our arrangement with the most studious care, not only in reference to the object itself but to the peculiarities of the chemical action of light. Suppose, for instance, a lady wearing black drapery seated upon a scarlet chair, beside a table covered with a red cloth, and before a dark back-ground in the usual subdued light, is the subject you are about to photograph, you will at once perceive that the picture you are about to produce will have a white face, ghastly from contrast, staring out from a dense black mass, swallowing up all the details of dress, figure, chair, table, and back-ground; and therefore you substitute a lighter back-ground, a chair which will relieve the figure, throw the table into deeper shadow, and permit a stronger light to fall upon the illuminated portion of the drapery, thus obtaining in your finished photograph the grandly simple quality which artists term breadth, and the force, roundness, and brilliancy of tone arising from proper contrast and relief.

But while anxious to obtain that relief upon which roundness and force of effect depends, carefully avoid contrasts of too violent a nature: harmony of tone is of no less importance than harmony of colour, or the same principle in music; the lights should melt imperceptibly into shadow, and the shadows graduate gently into darkness.

In arranging your light and placing your sitter you should so contrive that all the prominent features are well lighted: the half tints and shadows will thus find their places upon the retiring surfaces, and due relief be obtained. The strongest light should fall upon the upper portion of your model. Thus, as Fresnoy says—

> "——— from the light receding, or the eye,
> The sinking outlines take a fainter dye.
> Lost and confused progressively they fade,
> Not fall precipitate from light to shade."

How many photographic portraits do we find in which an ill-lighted face and figure destroy the pleasing effect which the photographer's chemical and optical experience and careful manipulation really deserved to compass! All our great artists advocate the vital importance of a proper distribution of light and shade, and the great principles of *chiaroscuro* are of no less consequence to camera pictures than those of the brush and pencil. I have a practical acquaintance with the difficulties to be met with in the chemical action of colours, &c., but studious forethought will go far to meet them; and I am confident that sun pictures can be obtained with *all* the advantages now claimed exclusively for the painter's productions—not easily, I grant you, nor perhaps for the remuneration now given; but as photographs assume higher rank, and take their place in the domain of art, they will readily obtain their fair value.

I cannot now pursue this matter further, but most earnestly advise the photographic student to do so; works upon the subject are cheap and plentiful, and the application of its theory to his practice will call for no great mental effort. Although my present purpose is to assist the colourist, these remarks are by no means unnecessary; for though much may be done by the artist of experience to improve a bad photograph, *it can never be made a really good picture unless it be one in its untouched condition.* I therefore make no apology for the introduction of this chapter.

What further I have to add upon light and shade may be given in a small space.

Pictorial effect is dependent principally upon a quality termed "breadth,"* by which is meant a simple grandeur and beauty of appearance, obtained by grouping together in separate masses the light and dark portions (whether formed by light and shadow or light and dark objects), and, without sacrificing the necessary relief of important parts, avoiding every thing like spottiness or obscureness of effect. One principal light and one principal shadow are preserved to give intensity and brilliancy to the whole. I cannot pause to develope the philosophy of this plan, but practice will fully demonstrate its value. Correggio, Frederico Barroccio, Guercino, and the Carracci used to model figures for their paintings, in order that they might so arrange and illuminate them as to obtain the best effect: why cannot photographers do this also with their living models? The forms and shapes of lights and shadows should be, as a whole, graceful; beautiful outlines should be relieved with light, unpleasant ones lost in shadow; half tints and shades should be skilfully grouped and blended, and the reflected lights carefully observed, for to these we owe that transparency and variation of shadow which, successfully imitated by art, forms one of the most conspicuous charms of our best pictures, but which are too frequently represented in ill-lighted photographs by strikingly unnatural patches of opaque black.

The power of reflecting light of varying intensity is, in the hands of skilful professors, of the very greatest utility. A very capital contrivance for preserving breadth and obtaining relief is found in the use of graduated backgrounds. The pages of a contemporary recently contained numerous plans, of a very complicated, troublesome, and imperfect nature, for obtaining these backgrounds. I forwarded the editor my own method, but the communication was merely acknowledged, its simplicity perhaps begetting some doubts as to its utility.

My homely, but *perfectly successful*, plan is easily described. Having painted the background a warm grey, I paint in or near the centre a circular patch of a very much lighter tint, and with the end of a large brush, held at a right angle to the surface, I tap or stipple the lighter into the darker tint, until the one mingles imperceptibly with the other, and my graduated background is complete.† According as you place this behind the sitter, it may either relieve the shadowed, or spread the light upon the illuminated, portion of the head and figure.

Of no less importance to pictorial excellence is the proper posing of sitters. A beautiful and elegant woman loses half her charms when depicted in a vulgar and ungraceful position, and a man may seem a gentleman or a clown according to the attitude in which he is represented.

Points of resemblance, the embodiment of personal character, age, &c., must of course receive due attention; but more than these are essential to pictorial excellence. Having placed your sitter in an easy attitude before the camera, consider first if it be one most advantageous to the expression of character; examine the outlines formed by the figure to ascertain if there are any formal angles or ungraceful points which can be avoided or rendered less conspicuous, and then endeavour to call forth such an expression upon the sitter's face as may be most pleasing to himself and friends, and in the same proportion to yourself.

Another study of as great importance is that of expression. Some of our great painters demand for one portrait as many as fifty sittings, not of course for mere manipulatory details, but for the embodiment of an expression which should most forcibly depict the very soul as it were of their model. The accomplishment of this lofty aim is commonly held to be the great point of superiority which the painter claims above the photographer; but why? The painter must see the expression before he can paint it, and he must see it more than once: place the same expression before the eye of our camera, and however transitory it may be, the art which can depict a cannon ball in motion will seize and render it at once permanently visible. I know it will be objected that such an expression comes and goes like a lightning flash, and that the process used for portraiture necessarily occupies some few seconds; but my experience teaches me that the expression is dependent upon the feeling, and it is only the more intense feelings (which are never

* I merely use this term here in reference to *chiaroscura*. I shall have to refer to it again in connection with colour.

† Any ordinary house painter will understand this description, and produce the background therefrom.

expressed in mere portraits) which come and go with such lightning-like rapidity. I have seen the most beautiful expressions and the most characteristic upon photographic portraits produced by men who have aimed at something more than "a mere map of the face" (as one of our painters used to call an expressionless portrait), and who produced not only photographs but *pictures.* The great point is to excite the necessary expression in the face of your sitter. Now this is not done by solemnly impressing his or her mind with a nervous fear of moving—better spoil a dozen plates than do this; but endeavour to make the individual to be photographed perfectly at home, and by conversation of a pleasing nature call up such an expression as you may think most characteristic or desirable. It is very common to see photographic portraits of uncomfortable-looking ladies and gentlemen upon whose faces we read at once a feeling of nervous apprehension, as if they were waiting the extraction of a tooth, but these are not less objectionable than grinning likenesses. Should the sitter desire to smile while sitting, the smile should be a faint one; for, however beautiful it may be flitting like passing sunlight over the face, when it is seen fixed and unchangeable it too frequently conveys only the idea of a grin.

Much more might advantageously be added upon the subject of this chapter, but as my real purpose applies rather to colouring than taking photographs, I must refer the more earnest student to the numerous sources of art-knowledge now open to all, rich and poor inclusive.

Letters to a Young Photographer.

No. X.

My Dear Eusebius,

Safely arrived within the sanctuary of your dark room, you will close the door behind you and securely fasten it, lest some thoughtless intruder should incontinently lighten your darkness when you least require it. You are now about to *develope* your picture, if you have got one, for it is not quite certain that you have, although you may think yourself entitled to one, having strictly followed my injunctions. Perhaps there is a screw loose somewhere, and if there be we shall soon discover it.

The developing solution that I usually employ consists of—

Distilled water	10	ounces.
Pyrogallic acid	20	grains.
Citric acid	20	"

For a plate measuring eight and a-half by six and a-half inches, take about one and a-half to two ounces of the above in a graduated glass measure, and holding the plate in the left hand, pour the solution over it so as to cover the surface entirely as quickly as possible. Sometimes the collodion presents a greasy surface; then the developing solution spreads evenly over the surface with great difficulty. If you find you cannot make it cover at once, pour off the solution into the measure, and then pour it on again. It requires some slight degree of sleight of hand to perform this operation skilfully, and no amount of *telling* will make you *au fait* at it; you must try, and if you fail, try again until you succeed.

Supposing all goes well, soon after your developing solution has covered the collodion you will see the picture begin to appear, and gradually become stronger and stronger, until it has attained the full degree of strength desired. The portions of the image that first make their appearance are the high lights; in a portrait they are the linen, the reflected light from the forehead, and other salient parts. You will be puzzled to make out your first picture; when you perceive a grim black-looking visage, looming out of the mist, it will require some little effort of your mind to realise its relationship or identity with the original; but you will gradually come to consider that in your picture the lights and shadows of nature are reversed.

If your picture is very slow in making its appearance, it may be necessary to pour the developing solution off and on several times, and even to add to it a few drops of the nitrate of silver bath. But you will want to know when to stop—when your picture is developed sufficiently, and this is a knowledge that must be gained by experience. As a general rule, unskilled photographers develope their pictures too much, by which they lose harmony of light and shade. If the developing is carried too far, the *darks* become quite dense and opaque, producing a hard raw effect in the lights of the positives taken from them. The negative picture must be examined from time to time, by being held up to the light, or before a taper, the light of which must always be visible through the darkest parts of the image. A picture that is over-developed requires much longer time to print positives from than a properly developed picture, besides being inferior in other respects. The thing is to hit the true medium; for an under-developed picture is quite as objectionable as the one I have described, as it allows the light to pass through it too freely in printing, and the positive will appear dull and heavy, without sufficient contrast between the lights and shades.

As soon as you think you have reached the maximum point of developing, pour off the now dark-brown solution into a recipient for residues (as it contains some silver), and then pour over the picture three or four measures of water, and set it up on one corner to drain on a piece of blotting-paper.

Most of the formulæ for developing that you will meet with substitute acetic acid for the citric acid I have indicated. It is true acetic acid developes quicker, but that is no recommendation with me, for I prefer to have the picture to come out slowly, as it is then under more complete control; besides citric acid is much more economical, it has no odour, it is solid, and therefore much easier to carry about, and what is most important is, it gives pictures of a better quality. The *darks* of a picture developed with citric acid are more transparent than those yielded by acetic acid.

Sometimes the developing solution becomes thick and very much discoloured before the image is completely developed; in that case it is necessary to pour off the solution, rinse the plate with a measure of water, and pour on a quantity of fresh solution.

There are other modes of developing sometimes employed, especially that with sulphate of protoxide of iron. This reducing agent, which has enjoyed various phases of popularity and neglect, is not so manageable in the hands of beginners as the developing agents I have already indicated. But as I know you will not be satisfied to remain in the dark on any point of interest in your art, I will communicate it to you.

You make a saturated solution of pure sulphate of protoxide of iron in cold water; then take of this

Solution of sulphate of iron	10	ounces.
Water	5 to 7	"
Acetic acid	2	"
Alcohol	2	"

You may make any quantity of the saturated solution of sulphate of iron you think proper, by putting into a bottle nearly full of water as many crystals of sulphate of iron as it will dissolve, and then adding a few more, together with a few pieces of iron wire. It will keep any length of time if the bottle be kept corked. The developing solution had better be made fresh every day, as it will not keep long without decomposing. The alcohol is not absolutely necessary, but it serves to make the solution spread more evenly over the collodioned plate.

When this solution is poured over the collodion, the image begins to appear very quickly, but still gradually; if it does not acquire sufficient intensity, pour off the solution, and then pour on to the plate a measure of nitrate of silver of the strength of four per cent., and alternate this, if it be necessary, with a fresh measure of the iron solution. Generally, however, a good picture comes out at once. The advantages in this developing agent consist in its enabling you to secure a good result when the plate has not been sufficiently exposed to yield a picture with the developing agent first-named; therefore it is always employed in obtaining positives on glass. It will also bring out certain details that escape the other developers, such as the details of the beard, or hair of the head in a portrait, dark foliage in a landscape, &c. This mode of developing is by some operators varied in the following manner:—A vertical or horizontal bath is filled with the solution of iron, and the collodioned plate immersed in it—the image appears immediately; then remove it from the bath and wash it carefully, and when the last drop has run off, continue the developing with pyrogallic acid, to which a few drops of solution of nitrate of silver is added. The picture will soon be completed: it is then washed as before indicated. You can also develope with gallic acid. Pour upon the plate a measure of a saturated solution of gallic acid, and as soon as the image begins to appear, pour off the gallic acid into a measure, into which you have previously put a few drops of a neutral solution of acetate of lead, of the strength of five per cent. A white curdy precipitate immediately appears, the whole is thrown on to the proof, and the developement is continued, keeping the plate in constant motion meanwhile. This method answers very well for plates that have been under-exposed in the camera, as it yields tolerably opaque darks.

With all your care it will sometimes happen that your negative turns out weak, whatever developing agent you employ, and it then becomes necessary to strengthen it; this can be done at any time before the plate is varnished. It is only necessary to wash the plate in several waters, and pour over it a measure of a saturated

solution of gallic acid, mixed with about a tenth of its volume of a solution of aceto-nitrate of silver, made as follows :—

Distilled water..............................100 minims.
Nitrate af silver.............................. 10 grains.
Acetic acid .... 8 minims.

Let the plate remain covered with the mixture for a few minutes : the darks gradually become stronger, and the minuter details make their appearance. When the desired vigour is arrived at, pour off the mixture and wash the plate with water. This operation must be carried on in the operating-room, sheltered from the light, and be conducted with great watchfulness, lest the darks become really opaque.

Photographic Glossary.

Laboratory — The workshop in which chemical operations are performed — the operating-room.

Lac — A resin produced by the puncture made by an insect, *coccus lacca*, on the branches of the *croton lacciferum* the *ficus religiosa*, which grows in the East. It is the chief ingredient in sealing-wax and in lacquer. It dissolves readily in alcohol and in a solution of borax. When bleached it is nearly colourless. Its solution in alcohol forms a good varnish for collodion negatives.

Lamp-black — Carbon in the form of soot, obtained by burning resinous substances with a limited supply of atmospheric air. It forms a dense black pigment, used in oil and water-colour painting, and in photography in carbon printing. Mixed with lac-varnish, it is used to blacken the interior of optical instruments, cameras, &c.

Lead — A well-known useful metal. With the acids it forms certain salts which have been employed in photography ; these are the acetate, chloride, and nitrate.

Leather — This substance is sometimes employed as a recipient of photographic images. The first experiments of Wedgwood and Davy were made upon leather. Collodion positives are now sometimes taken upon or transferred to black enamelled leather as a support instead of glass.

Lemon Juice — The juice of lemons consists of water, mucilage, about 5 or 6 per cent. of citric acid, and extractive matter (hesperidin). It is sometimes added to the nitrate of silver solution in positive printing.

Lens — A transparent body, one or both sides of which is curved, and which, according to this curvature, either condenses or scatters the rays of light passing through it. Lenses are generally made of glass or rock crystal, the surfaces of which are either plane or ground spherical, and convex or concave. A lens with both surfaces convex, or with one surface plane and the other convex, or with one surface concave and the other convex, or in general terms, a lens which is thicker in the middle than at the edges, is a *converging* lens ; they are called respectively bi-convex, plano-convex, and concavo-convex or meniscus. A lens with both surfaces concave, or with one surface plane and the other concave, or in general terms, a lens that is thinner in the middle than at the sides, is a *diverging* lens. The judicious combination of these variously formed lenses, produces the achromatic lens, and that other combination termed by the French—the '*objectif.*'

Light — An emanation from luminous bodies, the principal source of which is the sun. A ray of light proceeding from this luminary which appears colourless, or white, is a compound of several colours, which, when decomposed, form the prismatic spectrum. A ray of solar light consists of luminous rays, calorific rays, and chemical or actinic rays ; and it is these latter that produce those changes in bodies submitted to their influence that constitute the principle of photography.

Lignin ; Cellulose—This substance constitutes the fundamental material of the structure of plants, forming a large proportion of the solid parts of every vegetable. It is met with in a pure form in paper, cotton and old linen. Lignin must not be confounded with *ligneous* or woody tissue, which is in reality cellulose, with other substances superadded. Lignin when pure is white, diaphanous, tasteless, insoluble in water, alcohol, ether, and in the fixed or volatile oils. Dilute acids and alkalies exercise but little influence upon it, even at a boiling temperature. Sulphuric and phosphoric acids, when concentrated, attack cellulose, and cause it to undergo remarkable changes ; they transform it first into a substance resembling *dextrine*, then into *glucose*. Fuming nitric acid (cold) combines with it, and forms an insoluble but combustible and explosive substance—gun-cotton (pyroxyline). Boiling nitric acid converts it into oxalic acid. Acetic acid has no action upon lignin. It is not coloured by iodine. In a solution of chlorine it undergoes a kind of combustion. Dr. Schweizer has recently shown that cellulose is soluble in certain compounds of ammonia and copper (see page 80).

Liquor Ammoniæ — Aqua ammoniæ. A solution of ammoniacal gas in water.

Liquor Potassæ — Aqua potassæ. An aqueous solution of caustic potash.

Litmus — A substance employed for colouring test papers, obtained from various lichens. It is of a violet colour, and sold in the form of cakes. The colour of litmus is reddened by acids. Alkalies restore the original colour.

Logwood — A dye-wood. Both water and alcohol take up its active principles. Acids render its decoction of a brighter red ; alkalies produce a purple-blue colour. The salts of iron and bi-chromate of potass throw down a blue-black precipitate, which constitutes the basis of a process for positive printing without the salts of silver.

Lunar Caustic — A name given to nitrate of silver when fused and moulded into sticks of the thickness of a quill. This form of nitrate of silver is commonly adulterated, and should not be employed in photographic formulæ.

Marine Glue — A useful cement for uniting surfaces of glass, &c., said to be composed of caoutchouc and shell-lac.

Mastic — A resin obtained from the *Pistachia lentiscus*, a shrub growing in the Isle of Chio. It is of a pale yellow colour, transparent, dry, and brittle. It is soluble in ether, but insoluble in water. Alcohol when cold dissolves about nine-tenths of the resin, the remainder is soluble only in hot alcohol. Dissolved in alcohol or turpentine it forms a varnish much used for pictures.

New Books.

A Dictionary of Universal Information.
London : Beeton & Co.

We have been favoured with a request to review the above, and as it professes to give *universal* information, of course there appeared nothing extraordinary to us in such requirement, as we naturally concluded that *photography* would form a part of the things treated of, which are legion; but we look in vain for anything connected therewith. This is much to be regretted, for, judging from the style of treatment of those subjects which are included (such as history, biography, geography, theology, mythology, and a host of other *ologies* and *ographies*), the exclusion of photography appears to us to have been a decided mistake.

We can only presume that the proprietors, in sending us a copy of the work, intended thereby to feel the pulse of the photographic community, to ascertain whether the including of matters pertaining to their art would be acceptable. We think there is a very good opening for such an addition, and the various pieces of apparatus would form capital subjects for the numerous wood-cuts with which the work is interspersed.

Foreign Correspondence.

Paris, May 7, 1859.

There can be no question that the present Exhibition of our Photographic Society is the best that has ever been presented to public gaze. Not only in point of numbers (there are upwards of thirteen hundred frames), but also in geographical distribution of contributors is the Exhibition remarkable, apart from the intrinsic excellence and variety of the photographs exhibited. Spain sends *portraits* and *Ethiopian types* from Seville, and fine Roman and Moorish *architectural* subjects from Madrid. From Italy we have fac-similes of nine *drawings* by Raphael, by Alinari Brothers, of Florence ; *sculpture* and architecture from Rome ; *portraits*, printed with nitrate of uranium, from Naples ; from Venice, *views* in Algeria and Spain, *architectural* subjects, and sculpture ; Padua sends *panoramas* of Venice and Milan ; Turin sends *portraits*, and Milan sends *copies* of paintings by the old masters. There are contributions from Pernambuco, Brazil, Bucharest, Mount Caucasus, St. Petersburgh, Mount Athos, Jerusalem, Belgium, Holland, Germany, Switzerland, and England. The photography of the world

may be said to be represented, with the exception of the United States. This gives a fine opportunity for comparison, and, all things considered, the French may be said, if not to bear the palm, at least to hold their own. Of course, mustering in greater numbers, they appear to greater advantage. England is represented by the carbon printing of Mr. Pouncy, by Messrs. Maull and Polyblank, Mr. Roger Fenton, Mr. H. Robinson, and Messrs. Caldesi and Montecchi: these latter gentlemen exhibit their photographs of Raffaelle's Cartoons, which excite the greatest interest among this art-loving people. The French photographers are strongest in portraits and in architecture. Landscape is less cultivated than many other features of the art. There is a very fine series of forty views in the Holy Land, contributed by M. Graham scenes in Corsica, by M. Varin; views in Algeria, by M. Moulin; the Pyrenees are depicted by Mr. Maxwell Lyte and M. Mailand; views in Switzerland by M. de Constant Delessert; views in Egypt and Nubia, by M. de Campigneulles. A great many copies of paintings figure in the Exhibition: among the most interesting may be particularised a series from the works of Hemling and other Flemish painters of the fifteenth century, Van Eyck, Albert Durer, and others.

Of processes, wet collodion seems to be preferred by the majority of exhibitors, although most of the other processes in vogue have their representatives. Very good pictures are presented from waxed-paper negatives. Taupenöt's process has many followers, but I see none of Fothergill's improved method. Many of the exhibitors describe the mode by which the positives are taken. Mr. Maxwell Lyte's views show what can be accomplished by his toning process with phosphate of soda. Some pictures are toned by chloride of platinum. The lens, time of exposure, and developing agent, are also specified by some artists, by which we are enabled to form a comparative estimate of what may be expected and accomplished by each. In one case the negative was produced by the aid of the electric light, but I do not see that any one has made use of Mr. Moule's *photogen*. There are proofs taken with nitrate of uranium. The proofs from Bucharest, very interesting ethnographical subjects, are from negatives taken on waxed linen. Of course all the best French photographers are included among the exhibitors; and the works of Bisson, Baldus, Le Gray, Bingham, Aguado, Bilordeaux, are as readily distinguishable among others as the works of different painters, and this is an enigma which those who regard photography as a mechanical art can by no means readily solve.

Upon the whole, the impression made by the present exhibition is highly gratifying and encouraging. It satisfactorily proves that photography has a special and pecular mission of its own, that it is growing in strength year by year, and taking its place among the graphic arts without disturbing or dislodging others, as was first expected of it. Many a painter who mistook his vocation has become a good photographer, and thus art has become weeded of much mediocrity. I admire the dignified character of the works exhibited; they show that the artists respected their vocation and sought to do it honour. There is a total absence of those punning titles to pictures, and those lame attempts at wit whereby some weak-minded artists seek to provoke the risibility of the groundlings.

Criticism upon works of art I hold to be of no value unless it be made in the presence of the works themselves. Therefore I shall not attempt to convey to you by letter what can be expressed only very inadequately by the articulate word, even on the very spot where are the works that call forth remark. What would it profit you were I to write down that this picture is "beautiful," that "surprising," and the other "charming." You have no mirror of my mind in which those words are reflected in the sense I employ them. Among the crowds of intelligent-looking people, who daily crowd this *pavillon*, the words I most frequently hear are those I have quoted, especially the "charming." These are all expressions of one and the same sentiment — that of gratification or pleasure. Our notions of what is "charming" differ materially, not only among different persons, but also in the same individual, at different periods. For instance, I once thought that red (auburn?) hair and blue eyes, with an aquiline nose, constituted the type of female beauty; but now I incline to the standard of black curling hair, dark-brown or violet eyes, and a *nez retroussé*. Between the blonde and the brunette there are many degrees of difference, and although we may give the preference to the one to-day, to-morrow we may be hopelessly captive to the other. Here I stand puzzled to decide which is the best photographer, or rather which I like best — now it is Bisson, then tis Baldus, next it is Aguado. Among all the one hundred and forty-four exhibitors there is a wonderful individuality; if the good qualities of each could be concentrated in one, then would the triumph of the art of photography be accomplished.

It is not improbable that photographers may soon be able to dispense with light altogether, and, as I have previously suggested, photography itself become superseded by thermography. M.M. Bouilhon and Sauvage have carefully investigated the philosophy of the experiments of M. Niëpce de Saint Victor on stored-up light, and, *mirabile dictu!* have discovered that the results he obtained, and first attributed to light, and then to heat, are in fact due to neither one nor the other, but to a new agent, which has yet to be examined and described, but which M. Paul Thenard at present considers to be *ozone*. But when the experiment that produces the effect attributed to stored-up light is repeated upon sensitised paper, acted upon by *ozone*, the result is wanting. Or to state the matter more literally, M. Thenard made the following experiment. He took a piece of white paper, previously kept in the dark, and exposed it to the vapour of water, and which was not only not solarised, but on its surface all luminous vibration was extinct. The paper was rolled up and placed in a tube, and a current of ozonised air passed into it, and the tube closed. The tube was after a time opened in the dark, and a piece of sensitised paper was placed over the orifice: in a few hours the silver was reduced upon the surface of the sensitised paper, the opening of the tube being well defined in black upon it. This impression could be attributed only to the reducing action of ozone. And yet, what is most singular and perplexing, when a current of ozonized air was passed into a tube containing a sheet of sensitised paper rolled up, no reduction of silver nor impression was produced on the surface of the sensitised paper! Whatever M. Niëpce may have failed in, when attributing the results he obtained to the action of stored-up light, he has the unquestionable merit of opening up a new field of inquiry, and placing even *thermography* upon a new route. I have just learned that Dr. Page, of Washington, has shown that heat is a much more powerful reducing agent than light, and he proposes to print by it not only photographs, but books, and even newspapers! He experimented with a box with double sides, between which he introduced a current of superheated steam. With paper sensitised with iodide of silver, he obtained as many as five hundred proofs in one night, and he could work even quicker than that, if desired, by placing his box upon an iron table, covered with flannel. This result will certainly form a new era in photography. Dr. Page does not claim originality in this application, as similar results were obtained in 1840, by Dr. Draper, of New York. M. Cusco, surgeon, has made an ingenious application of photography of depicting diseases of the eye, which I shall describe more fully in my next. J. P.

New York, 27th April, 1859.

By the annexed scrap, which I have clipped from a daily paper, you will see we *are* progressing in enlarging the area of photography by applying it to useful purposes, and one also to which it was thought next to impossible to apply any process, viz., to hold slippery politicians from falsifying their past acts. It is written in the good book "Thou shalt not speak evil of the ruler of the people," so I must not say a single word of *Mr. Buchanan*, unless I infringe the command.

The Hon. Robert J. Walker has had Mr. Buchanan's letter to him when Governor of Kansas, photographed as a protection against accidents It is full and emphatic on the question of submitting the Constitution to the people, and upon every other point which he subsequently abandoned.

We are great inventors here: about a year ago we invented the art of photographing on wood, and a Mr. Price has received a patent for the process, although some years ago it was in all the journals of Europe. C. A. Seely, A.M., the greatest of all our inventors, has recently been initiated into a "*Supplementary Process*," but no account of it will appear in his journal lest too many should avail themselves of it. Although interesting to the American photographers, it is not at all adapted to *your* side of the water.

As something more interesting to you and your readers, I have very recently seen a stereograph of the moon, produced by an amateur of this city, Mr. Lewis M. Rutherford, of the Second Avenue. I only heard of it two days ago. I have since seen it at the opticians', where it was on view (not on sale), and was astonished at its clearness and beauty. All the details were well made out, and its convexity was perfect. In diameter it fills the stereoscopic field entirely. There was also another of the "half moon," equally clear and distinct as that of the full moon. Both are transparencies on glass, and I was informed that the second picture in each pair was taken at an interval of one month from the time of taking the

first one, so that the base of the two positions is equal to half of the diameter of the earth's orbit. [? Ed.] I shall try to get a copy of it, or them, to send you by a friend who leaves here next week *via* Galway, and who has promised to see a package I send by him safe to the publisher's in Liverpool. In the package will be some specimens of the art as practised here, which will, I hope, compare favourably with those of Europe. The photographs are all printed by young ladies whose names will appear on their several productions. Should clear weather intervene between now and the time the package leaves, one or more *scioptric* views will be sent with it.

Since the death of the *Photographic and Fine Art Journal*, its late editor and a Mr. Davies have brought out a new chemical product for photographers, which, if half what is said of it be true, must revolutionise the whole art. It is called the "ELECTRO-NITRATE OF SILVER." Your stock dealers *must* order it forthwith, or their customers will buy their goods on this side of the Atlantic, and then they may shut up shop.

The immense number of obscene stereographs which flood this market from France is truly awful, and this is rendered more so by the prices at which they are sold—few of them costing more than 1s 6d sterling each. Cheap daubs of groups, from London, are also overflowing the toy-shops at every corner. ARGUS.

Correspondence.

APPARATUS FOR FROTHING ALBUMEN.

To the EDITOR.

SIR,—Seeing in one of your former numbers a description of a machine for frothing albumen, which, however efficient, must be too complicated, cumbersome, and expensive for the generality of photographers, I thought a description of a simple apparatus which I always use might be acceptable.

It consists of a rod of wood, about one foot long and three-quarters of an inch in diameter, one end of which is slit crosswise for two or three inches; into the slits are inserted slips of quill, the ends of which project from the cylinder an inch or more. In this simple form, suggested to me by a friend, the beater end inserted into a jug with a narrow neck or wide mouthed bottle containing the albumen mixture, the upper part of the rod is made to rotate between the flat hands, and thus the albumen is cut and beaten smooth.

I have made the thing more effective by adding a handle flattened at one end. A pin driven into the top of the rod passes loosely through the handle; above the handle a small sheave wheel is driven tight on the pin, and carries the cord of a drill-bow, by means of which the rod is made to rotate very swiftly, thus saving time and labour.

Another plan I might suggest, viz., that any one possessing an Archimedian drill-stock, a tool generally useful in mechanics, might very easily adapt to it a beater of the kind described.

I give above a diagram of the instrument, lest my description should not be intelligible without it.—I am, yours, &c.,

Cheltenham, April 29, 1859. G. S. PENNY.

BLACK VARNISH.

To the EDITOR.

SIR,—Some time ago many and grievous complaints were made about black varnish, none seeming to give satisfaction, either taking a long time to dry, or cracking when dry.

I have for some time past used "Bates's photographic black varnish," which I have found answer capitally. It does not crack, nor is it at all long in drying; and last, but not least, it does not smell so abominably as nearly all other varnishes do.

If you think it worth while to put your readers in possession of these facts, you will oblige by publishing this at your convenience.—I am, yours, &c.

ONE WHO HAS BENEFITTED GREATLY BY THE HINTS WHICH FROM TIME TO TIME HE HAS FOUND IN YOUR JOURNAL.

HOOPER'S TURPENTINE WAXED PAPER PROCESS.

To the EDITOR.

SIR,—How is it that when I dissolve the wax in camphine by the aid of heat, the wax on cooling precipitates itself in small particles?

Should the turpentine or camphine be twenty fluid ounces, or twenty ounces by weight?

I presume the solution must be allowed to cool before filtration. Replies to the above queries will oblige.—Yours, &c. C. H. E. C.

[Hot turpentine dissolves more wax than cold; the wax also may be adulterated with fat of some kind, hence the deposit. Let it subside, and filter when cool. Fluid ounces are those meant.—ED.]

SULPHURIC TONING BATH.

To the EDITOR.

SIR,—In reply to your inquiries respecting my failures with the above, I beg to say, that I use Marion's paper, albumenised according to the formula given in page 25 of *The Photographic Journal*. After pretty long exposure under the negative, the proofs were washed in rain water, to take off the free nitrate of silver, and then placed in the hypo. bath, some for half-an-hour, and others half that time. On taking them out of this, they were again well washed. While in the last water, I prepared the toning bath, into which they were, after a little draining, immediately plunged. They were carefully watched, in expectation that every instant would bring them to the desired colour, but they passed from the red colour given by the hypo. to that of the enclosed, which, you will perceive, has diminished in sharpness from the time in which it was immersed in the sulphur bath, which was about fifteen or twenty minutes.

I tried three different baths, but the result was the same with each. My nitrate bath was of sixty grains silver, with from two and a-half to three minutes floating of the paper. Thanking you for your kindness, and hoping you will be able to solve my difficulty, which I—being totally unacquainted with chemistry—cannot do, I am, Sir, your obedient servant, D.

[By reference to page 61, "D." will perceive, that he has mistaken the *time* during which the proofs should be immersed in the sulphur bath, a few *seconds* being sufficient—from one to three or four, according to the rapidity with which the sulphur is eliminated. After attaining a deep violet and purple colour, the proofs next become black, and if the immersion be prolonged, they become olive green and yellow, and consequently spoiled. No wonder "D." has not succeeded, when he immersed his proofs from fifteen to twenty *minutes*. If the desired tone is not attained in one or two seconds, it may be concluded that something is wrong. Let him try a proof that has been simply washed, and not immersed in the bath of hyposulphite for fixing, until after it is toned, merely to see if the toning does not quickly take effect, not as a practice to be followed. We frequently put proofs into the sulphuric toning bath after simply washing off the free nitrate, and the results are very satisfactory.—ED.]

ALBUMINATE (?) OF SILVER.

To the EDITOR.

SIR,—As some photographers seem bent upon introducing a new term into the chemical dictionary—"albuminate of silver"—it behoves them to see they have good authority for so doing, lest we should some fine day derisively draw upon ourselves another new term—"photo chemists."

The only experiment I have seen published for proving the existence of this chemical compound is that of adding a solution of albumen to a solution of oxide of silver, the resulting precipitate being dubbed albuminate of silver, without any after research to establish the fact.

Now, supposing albumen *pur et simple* does combine chemically with oxide of silver, what is the result of adding it to nitrate of silver?

The albumen unites with the oxide, liberating nitric acid; but as nitric acid also precipitates albumen, another *quasi* chemical is formed, which, I suppose, must be called nitrate of albumen—I should scarcely think the founders of the *albuminous* theory would call it albuminate of nitrogen. Therefore, the film left on the sensitised plate would be albuminate of silver, the other albuminate compound. Now, if we admit the chemical combination with silver, why not also with the other metals, and thus introduce an extensive range of albuminates?

I make no attempt to disprove the chemical affinity. My only object is to protest against the acceptance of an ideal deduction drawn from a simple experiment of there being a new combination of silver, ignored by all the highest authorities on chemical science.

Amongst the great variety of substances that coagulate albumen is tannin. Query—Would this be called tannate of albumen, or albuminate of tannin.—I am, yours, &c.

Islington, May 3, 1859. THOS. A. BARBER.

[Albuminate of silver is clearly a misnomer, as it indicates an acid oxide of albumen united to oxide of silver. It has, however, been clearly demonstrated by Mr. Hardwich that a compound of some kind, sensitive to the chemical rays of light, is formed by the union of white of egg and nitrate of silver: further, that a photograph on albumenised paper consists of metallic silver in combination with albumen, or, at any rate, an organic substance; but what is the exact nature of these combinations has scarcely yet been ascertained. We think the term albumenide of silver would be less objectionable.—ED.]

HONEY PROCESS, &c.

To the Editor.

Sir, — In my communication of the 1st instant (page 115), I omitted to state the quantity of water used with the developer—iron one drachm, citric acid four grains, water four ounces. Your readers will easily recognise it as the formula recommended by yourself in a previous number. I have been experimenting further in the same direction, and enclose a print from a negative by the same process (honey), taken on the 3rd instant — a view of the hustings during the nomination (South Durham) —eleven-and-a-half inch focus, half-inch stop, exposure three-quarters of a minute; circumstances were unfavourable. The light was coming in an opposite direction, shining on the lens in fact — the temporary building being covered with a projecting wooden roof, prevented any light falling upon the "*honourable members and their friends.*" The figures in the "reporters' gallery" (being in front) have been easily identified. The close proximity of other buildings (in one of which I was located), and the focal length of the lens used, prevented me getting a greater number of the "*unwashed*" into the field of view, although it was computed there were 5000 present. From these experiments I have come to the conclusion, that with the same chemicals, a shorter focus (portrait) lens, with Mr. John Brown's (Newcastle) system of stops, and tolerable light, views of moving objects may be taken upon preserved plates, the exposure not exceeding three or four seconds. I am not inclined to give up the previous coating of the plate with albumen, thinking it increases the sensibility — at any rate, it allows of very rough washing, a fault I am addicted to, having a few inches of India rubber tubing attached to the water tap for that purpose; and also does away with the trouble of having to clean plates when you are about to prepare them. I albumenise them in an evening, by the fire side, dry well, and put by for use; give them another warming just before using. I read with much pleasure the interesting discussion on this subject at the last meeting of the North London Photographic Association, and hope ere long to see great improvements in this branch of the art.

On the subject of coagulating the first film of albumen, I find no ill effects from merely drying the plate well. Before pouring on the collodion dip it in the ordinary negative bath (after collodionising), which keeps as good a colour as ever. If it is essential to coagulate the albumen, would not nitrate of silver be preferable to sulphate of iron? The collodio-albumen bath, for instance. The print sent herewith was toned by Le Gray's formula: water, two-and-a-half ounces; chloride gold, one grain; chloride lime, one grain; chloride sodium, one grain. I would recommend double the quantity of water, the action being very rapid; the chloride of lime acts too strongly on the dark parts of the picture. I am not inclined to give up the old plan of toning with carbonate of soda, added to solution of chloride of gold, and used cold.—I am, yours, &c. CAUSTIC.

[The use of *nitrate of silver* to coagulate the albumen would be objectionable, because the compound thereby formed would darken on exposure to light; the sulphate of iron perfectly coagulates without this objection. Our object in suggesting its application was to prevent the liability to *mouldiness* complained of, as regards plates *long kept before use.* But it is of course unnecessary where there is but a short time elapsing before collodionising, and after that operation the silver bath of course effects the object, and the combination with the silver is then unobjectionable.—Ed.]

THE USE OF OLD COLLODION FOR THE COLLODIO-ALBUMEN PROCESS.

To the Editor.

Sir,—A reply to the following will oblige:—

1. Having an accumulation of old collodion of all makes, positive and negative, I put it altogether in one bottle to use for cleaning plates; it occurred to me, however, that it might do for the collodio-albumen process on albumenised plates, being very short in the grain and rotten. I added more pyroxyline; the colour, after sensitising, was pale, so I put in fresh iodising solution to bring it up, and now it seems to work well. A plate steeped in water for six hours, shows no tendency to blister; the only drawback is the presence of structural diagonal markings. The plate was *rocked* on pouring off the collodion, and where the film is thick towards the edge where the collodion was poured off the markings have cracked. Can you suggest a remedy?

2. What is the best method to remove an excess of acetic acid from a ollodio-albumen bath? Will oxide of silver added to it form acetate of silver? which substance is thought objectionable.—Yours, &c. B. J. D.

[1. There is probably an excess of water, which produces the diagonal lines; if so, put into the bottle of collodion some shreds of perfectly dry gelatine, and let them soak; they will swell and abstract a considerable portion of the water, without themselves being soluble in collodion.

Should this remedy not be sufficient, add about ten to fifteen minims of chloroform to each ounce of collodion; the pyroxyline will be partially precipitated, but will re-dissolve by shaking. Lastly, let the collodion set well before immersion in the nitrate bath, observing it by reflection from its surface, and do not immerse it until all crapiness has disappeared.

2. Oxide of silver added will form acetate of silver. A lump of marble dropped in will probably answer the purpose, acetate of lime being formed. But why not add more *nitrate of silver* to vary the relative proportions of silver solution and free acid?—Ed.]

HINTS FOR MANUFACTURERS.

To the Editor.

Sir,—Those of your readers who did not perceive that the diagram in last week's Journal was a printer's error, must set me down as a very vulnerable personage.

I inclose another diagram, which, however, it will perhaps not be necessary to insert, if I describe my idea to be, *one side of the groove perpendicular, and the other to form an angle of about thirty degrees, i.e.,* somewhat after the shape of the letter N

My reason for proposing metal was, that they may be easily cleaned with hot water, and as easily dried.

Another hint is, to make view metres for pictures 8×10, so constructed as to be folded up when not in use; they would save a deal of dodging about with the camera.—I am, yours, &c.

May 2, 1859. AJAX.

[Our correspondent is quite correct in supposing that the comical diagrams appended to his previous communication were errors of the compositor — the fact being, that the note reached us too late before going to press to enable us to see a proof. It fortunately happens that we were "tarred with the same brush," for as "Ajax" was treated to V's, we were served with U's.

We will now give what was really intended by both, viz. —

 and 

Mr. Sparling exhibited at the Photographic Society, about *five years ago,* a folding view meter — as now suggested.—Ed.]

CALOTYPE PICTURES, &c.

To the Editor.

Sir,—In your flattering remarks on my pictures, in your notice of the photographic soirée at the Mansion House, you seem to imply that they are done by the *waxed-paper process.*

Although in these collodion days it may not be a matter of much general interest, yet, for the sake of correctness, I beg to say, that I do not employ the *waxed-paper process,* but the *original process* of Mr. Fox Talbot.—I am, yours, &c. B. B. TURNER.

31, *Haymarket, S.W., May* 6, 1859.

P.S.—What do you think of the Photographic Society and its President being proposed and drunk at the Royal Academy dinner? B. B. T.

[We remember making the same kind of mistake with regard to Mr. Turner's productions upon a former occasion, and were then corrected; but the fact is, the manipulation is so superior to what we generally see in calotypes, that we were thus twice unwittingly misled in judgment.

We are rejoiced to perceive that the artists in colour are beginning to appreciate the value of photography.

They do well: it must be either a friendly assistant or a ruthless antagonist.—Ed.]

ANSWERS TO CORRESPONDENTS.

F. W. Hart.—Received.

Theta.—We really cannot do as you request.

Mary L**e.—Thank you for the compliment and the hint.

Walls.—Possibly your bath is out of order, being too acid; try it with test paper.

Jas. Moody.—See description of Murray and Heath's new water-tight glass bath, in our last leader; it is precisely what you desire.

T.P.—We have not received any previous letters from you on the subject named, consequently we could not have replied. Send particulars.

James Fergusson. — We have already stated that the stereoscopic transparencies of the waves by Mr. Samuel Fry are the best we have seen. See our advertisements as to where they are to be procured.

J. S. C.—1. Burfield and Rouch have a very convenient dark box; so have Murray and Heath, Ottewill and Co., and others. You must choose for yourself according to your requirements.—2. We hardly know what you mean by the most portable plate box; all that we have seen are portable enough. — 3. Herr Pretsch resides at 162, Great Portland Street, W., London.

Fred.—Fothergill's process is not dependent upon a particular collodion, though some kinds are more *convenient* for it than others. We prepared, the other day, four plates with as many kinds of collodion, some being *very* different from others, and were equally successful with all. We found, however, that some were handier to work with. Messrs. Horne and Thornthwaite, and Mr. Alfred Keene, of Leamington, both prepare collodion which they intend expressly for use in this process.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 95, Vol. VI.—JUNE 1, 1859.

Amongst our correspondence will be found a communication from Mr. Mayall, in which he notifies some modifications which he has adopted in the formula for making collodion that he considers calculated to keep sensitive, without deterioration, after excitation, for nearly an hour. The paper to which the note refers, it will be remembered, was given at length in our last, and we had it in contemplation to make a few comments upon the subject of it before receipt of Mr. Mayall's note, which however serves legitimately to introduce the matter.

To those of our readers who have little or no chemical knowledge, it may not be very evident *why* collodion, compounded as directed by Mr. Mayall, should remain in a state of exalted sensitiveness longer than any of the ordinary kinds; but when we recal to their minds the first efforts made towards a preservative process, as regards collodion, by Messrs. Spiller and Crookes, in 1854, viz., by washing the sensitised plates with a solution of some deliquescent salt, such as the nitrate of zinc or nitrate of magnesia (both of which were in succession employed by the above-named skilful photographers for the purpose), and hint that in Mr. Mayall's formula the same *principle* is adhered to, though with changes in the method of arriving at a similar end that entitle it to be regarded as a decided novelty, the mystery, if previously existing, is removed.

In the first place, Mr. Mayall makes a plain collodion, containing a considerable quantity of pyroxyline, and that rather of a spongy than of a dense character; and next, by iodising with a salt of *magnesium*, instead of the similar compounds usually employed, the film, on immersion in the nitrate of silver bath, becomes charged, by double decomposition of the ingredients brought into contact, with iodide of silver and *nitrate of magnesia*, the latter salt being precisely that previously employed in a different manner, to the same end, by Messrs. Spiller and Crookes: the utility of this salt consisting in its greed for moisture, thus to a great extent counteracting the usual effect of evaporation.

At the last meeting of the Photographic Society, the discussion arising out of Mr. Mayall's communication was so protracted that time did not permit us to make any rejoinder upon that gentleman's reply to our question, as to "how the salts of magnesium could possibly compensate for the ether or alcohol used in the manufacture of the collodion being slightly contaminated with water?"

Mr. Mayall's reply was to the effect, "that the magnesian salts acted in a similar manner to the chloride of calcium in abstracting the water from the spirituous compound;" but in this supposition he was clearly in error, for chloride of calcium being *insoluble*, can itself absorb moisture like a sponge, and in consequence of its *preference for water* will abstract it from alcohol and saturate itself therewith, whilst iodide and bromide of magnesium, being *soluble* not only in water but in spirit, is quite unable to act in the way contended for.

Mr. Mayall presumes that it is owing to the water usually contained in collodion that deterioration rapidly ensues after iodising; and as he finds that his collodion does not spoil even after being iodised for upwards of twelve months, he erroneously concludes that the permanency is owing to the absorptive power for water exerted by the magnesian compound, forgetting that cadmium salts, which are not deliquescent, enjoy the same immunity from change in the ordinary course of events.

The real use of the peculiar iodide made use of is that we have indicated at the commencement of this article, viz., that when converted into nitrate of magnesia, by interchange of elements in the nitrate of silver bath, its deliquescent properties enable it to replace the water lost by evaporation by re-absorption of water from the atmosphere, or, what is probably more likely to be the case, the deliquescent is sufficient to resist or materially retard the evaporative force.

A point of importance, in explaining the probable cause of some of our hitherto inexplicable failures in collodion pictures, was noticed by Mr. Williams at the last meeting of the Photographic Society.

It appears that, having twenty Winchester quarts of spoilt collodion sent to him for the purpose of recovering the ether, he attempted, after it was drawn off, to save also the iodising salts, and in the course of his operations for this purpose found, to his no little astonishment, that the residuum contained no less than one pound and five ounces of *oxalate of lime*. Such an unwelcome ingredient in collodion is quite enough to account for many of the spots, &c., with which some operators have been pestered, in spite of the utmost precautions as to cleanliness and general care in manipulation. It was mentioned that the *source* of the compound was pretty evident, but some of our non-chemical readers may like to know something more about it.

Whether the pyroxyline be made from cotton or paper, so far as our present inquiry is concerned, is quite immaterial, as in either case *lignine* is employed, a substance which under the action of sulphuric acid becomes converted into dextrine, and subsequently into grape sugar. But nitric acid, acting upon either of the last-mentioned substances, is capable of converting them into oxalic acid; hence it will be seen that during the preparation of pyroxyline it is quite possible that a portion of the lignine may be inadvertantly affording a supply of oxalic acid. Further, if this acid be formed during the manufacture of the pyroxyline, as soon as the same is immersed in water for the necessary washing, provided that the water contains any *lime* in solution or suspension, as is mostly the case, the oxalic acid will immediately unite with it, forming *extremely minute particles of insoluble oxalate of lime*. It would be almost impossible, with any amount of careful washing, to get rid entirely of such a precipitate when once formed; and although it is itself insoluble in ether and alcohol, it would of course be introduced into the collodion with the pyroxyline.

It is but right to mention, that a difference of opinion existed between some of our most eminent chemical authorities, not as to the source, but as to the time of its production—some inclining to the notion that the formation of the oxalate of lime was probably owing to the action of the heat employed to distil off the ether, decomposing the iodising salts and the products acting upon the lignine. We are, however—having listened to the arguments on both sides—persuaded, that the solution first given is the correct one. At any rate, however, we may regard

it as a fact that oxalate of lime does sometimes occur, and that it is certainly injurious.

To be forewarned is to be in some measure forearmed, and this is an additional argument in favour of using tall and narrow bottles for preserving collodion, as any deposit can be more readily left behind with a minimum of waste, and with less danger of disturbing the sediment, in pouring off the supernatant liquid.

In the second annual report of the Blackheath Photographic Society, which we publish in the current number, will be found some remarks which coincide with the opinion we expressed in our last relative to the experiments of M. Niépce de St. Victor, the results being attributed by him to the action of stored-up *light*.

We cannot, however, agree with the report in according to the same gentleman the credit of having *introduced* the uranium printing process, the merit of which we are of opinion is unquestionably due to Mr. J. C. Burnett, of Edinburgh, he having not only published his process *long prior* to the time when M. de St. Victor first directed attention to the uranium salts, but also exhibited at the Glasgow meeting of the British Association for the Advancement of Science specimens of his skill in the actual manipulation of his process. We trust that the gentlemen who drew up the report will look carefully to the records of the meeting quoted, and upon a fitting occasion amend the error.

Relative to the discovery of Mr. J. H. Young, of Manchester, that the latent image upon a collodio-albumen plate can be developed *after* removal of the iodide of silver, which is also noticed in the report, we are in a position personally to give evidence as to the fact that the same phenomenon does occur when the impression is obtained in the camera.

We prepared four plates by a modification of Fothergill's process, exposed them all in the camera for taking landscapes, all being exposed for an equal time; three of them we developed in the ordinary way, the fourth we experimented upon by removal of the iodide first of all, by means of hyposulphite of soda, then washed the plate, and while it was still wet, subsequently developed the picture by means of pyrogallic and citric acids, with of course some solution of nitrate of silver. The picture came out as rapidly and with an image fully as vigorous as those on the preceding three plates, but owing to the fact of our being somewhat eager to ascertain the result of the experiment, we neglected to wash away the hyposulphite of soda as perfectly as we should have done, and the consequence was, an ugly stain proceeding from one edge of the plate towards which the last washing water had drained.

With this exception the experiment was perfectly satisfactory, and but for the imperative and constant demands upon our time we should certainly have repeated the same with greater precaution, to avoid the defect to which we have alluded.

The phenomenon is one that we regard as of the highest importance.

REPORT UPON DEROGY'S PATENT PHOTOGRAPHIC OBJECTIVE LENSES.

In consequence of some observations which appeared in a previous number of this Journal, relative to the lenses above named, we received from Mr. Lloyd Chapman, the agent in this country for the sale of them, a request that we would examine and unreservedly report our opinion of any one of them — intimating at the same time that if we complied with the request, a lens should be placed at our service for such length of time as we might require for the purpose.

A critical examination of one such combination as indicated involves far more labour than appears at the first glance, for each set is equivalent to *six* ordinary lenses, being calculated to produce three distinct portrait and three landscape combinations.

We are so frequently called upon to advise correspondents in matters of this kind, that we determined to accept the task proposed, provided that we should be considered free to publish our opinion whatever it might turn out to be, and with this understanding we commenced operations.

The lens examined was one of size No. 2, for taking portraits $4\frac{1}{4} \times 3\frac{1}{4}$ in., $6\frac{1}{2} \times 4\frac{3}{4}$ in., and $8\frac{1}{2} \times 6\frac{1}{2}$ in.; for views 7×5 in., 9×7 in., and 12×10 in.

In order to accomplish all these variations the construction of the combination is peculiar, consisting of — first, a back and front pair of lenses, each corrected for its special position, and arranged as in an ordinary portrait objective. Instead, however, of these portions *screwing* into the respective ends of the tube, they are adapted to fit in by means of a *bayonet joint*, that by a half turn holds them firmly in place, but at the same time affords great facility for readily and instantly removing either.

With the preceding are supplied also two other supplementary lenses in separate mountings, also adaptable by bayonet joints, viz.— an achromatic concave and a similar convex lens — either of which can be placed *between* the first named normal pair. When so arranged the effect of the former is to lengthen and of the latter to shorten the focus of the original combination, and thus without any change of place, as regards either the sitter or the camera, a picture can be taken of three different sizes.

Again, the anterior combination is constructed to be used alone as a landscape lens, and to this end it is only necessary to remove all the others from the tube, and place the one under consideration at the end opposite to that which it usually occupies. Several diaphragms are supplied, and a fitting place constructed to apply them; but in addition to the diaphragm, the two previously mentioned *supplementary* lenses can also be employed, and thus three variations be made in the focal length of the landscape combination.

Lastly, a very ingenious cap is contrived to fit either the large diameter of the usual sun shade, or the smaller one of the tube above named, by making it double as it were in the cylindrical part.

In all of the above conditions, with one exception specified hereafter, we have not only examined optically the specimen sent, but also taking pictures therewith, and we now proceed to lay the result before our readers.

1st. As an ordinary portrait combination without addition we found the definition good, the field moderately flat, and though not equal to some of our English lenses, quite equal to any French ones that we have tried. The chemical and visual foci agree, as also in *all* the variations of arrangement.

2nd. With the supplementary convex lens, placed between the the two other, the definition is good, but the field not so flat as before, and although the focus is shortened considerably the increase of rapidity of action is but trifling, owing to the additional refracting surfaces of the third lens.

3rd. With the addition of the supplementary concave the definition good and the field flatter, but the increased focal length, together with the additional surfaces, as in the former case, considerably impair the rapidity of action.

4th. The anterior combination alone as a landscape lens — definition fair, rapidity good, field fairly flat, depth of focus considerable owing to an excess of spherical aberration. It is as good as any, and better than most of the French landscape lenses we have hitherto tried.

5th. The above with the addition of the supplementary convex lens in front — definition good, rapidity same as preceding, field moderately flat, depth of focus less than before, but this was more than compensated by superior definition.

6th. No. 4, but with the addition of the supplementary concave — the focal length and size of field covered were greater than we have convenience for taking pictures, consequently we merely examined the centre of the field optically.

As we before remarked, the chemical and visual foci agreed in all the arrangements of parts. The surfaces covered are correctly given. It appears from the above that the supplementary additions are highly advantageous for *occasional* use, and though the results gained are unquestionably not equal to those attainable by the best lenses constructed specially for pictures of any given dimensions, there are many operators who require but rarely to produce large-sized portraits, and whose means are not equal to the outlay necessary for a number of lenses, to whom those under consideration will be highly acceptable.

It must be borne in mind that as *ordinary* portrait or landscape lenses they are unquestionably good, and that the extra ordinary additions are simply substitutes. We think it but just to add that the prices charged are extremely moderate. We must, however, remark that we have tried *but one* set of lenses, though we have no reason to conclude that it was anything more than an ordinary sample, a considerable number having been freely offered for our selection.

In conclusion, we must remark that M. Derogy has adopted an arrangement, either wittingly or unwittingly, that the late Mr. F. Scott Archer employed with considerable advantage several years ago, and one with which he constantly worked to the hour of his death.

REMARKS UPON THE PREPARATION OF DRY PLATES.

By W. Hislop.

[Read at the North London Photographic Association, 25th May, 1859.]

It having been proposed at our last meeting that members should give their especial attention to the dry processes, for the purpose of bringing forward facts for discussion at the ensuing meeting, I take the liberty of offering a few observations, tending to show the direction in which my own experience leads me to expect we shall find the particular method of manipulating most likely to satisfy the desires of the amateur photographer. I do not think that we need busy ourselves in multiplying preservative solutions, inasmuch as the elements of success seem to be the same whichever method we adopt. Good pictures may be got by any process, but we want to know by what method of manipulation we may insure tolerably *uniform* success.

I conceive that no system of partial washing can give uniform results; for even if the manipulation be precise and faultless, the collodion itself is constantly varying from evaporation and other causes, and cannot be said to be precisely in the same condition for any length of time. It follows, that an amount of washing, which will leave a certain quantity of free nitrate under one set of circumstances and with one condition of collodion, will leave a different amount under another set of circumstances and with another condition of collodion. But this is not all. A slight difference of density in various parts of the film will sometimes obtain, causing uneven sensitiveness and stains.

We have then two courses open to us, either to wash thoroughly or not at all, before applying the preservative solution. In either case, care should be taken that the preservative solution, whatever it may be, is as nearly as possible of the same specific gravity as the water in which the plate has been washed, or the nitrate bath in which it has been sensitised. This will facilitate the mixing of the solutions, and the consequent incorporation with the film, and the results will be cleaner and more uniform.

The two methods of preparing dry plates on which I have experimented, with especial reference to this evening's discussion, are modifications of well-known processes, namely, Fothergill's and the oxymel process.

In the first, I find that I have been anticipated by a paper in a recent number of *The Photographic Journal*. It simply consists in using a very dilute solution of albumen, consisting of one part of white of egg to about thirty or forty of water, in which the plate is plunged after leaving the nitrate bath, being first drained and the moisture removed from the back. After about two minutes it is taken out, well washed, and dried.

The second plan has been published by Mr. Llewellyn. The plate is well washed under a tap after sensitising, and then immersed in a bath of iodide or bromide of potassium, containing five grains to the ounce of water. It is again washed to remove all trace of potassium compounds, and then has the preservative solution poured over it.

This is composed of half a drachm of oxymel, half a grain of citric acid, and three-quarters of a grain of nitrate of silver to the ounce of water. This solution may be used over and over again, and therefore a single ounce will go a long way. After the solution is poured on and off several times, the plate is set up to dry. I find in all cases it is desirable to dry the plates with moderate speed. I effect this simply by ranging them on edge on a shelf, filling a few old wine bottles with hot water, and placing them in a row before the plates. In a short time they will be ready for the camera.

As to the results of the two plans, I find that the first, or modification of Fothergill's manipulation, so far as I have tried it, gives very uniform and satisfactory results. The second gives a surface which is perfectly dry and hard, is also very sensitive, and *quick in developing*. The resulting picture has a remarkably even sky, and possesses good artistic qualities. There is one drawback: the film seems completely detached from the plate; but if the glass be previously *coated with dilute albumen*, this defect is perfectly remedied.

As to keeping qualities I am unable to speak from experience, not having kept plates for a sufficiently long period to speak positively, but I see no reason, from analogy, to doubt the capabilities of either plan in this respect.

REMARKS, &c.

By Alfred Keene.

Remarks upon "Amateur's" Communication of May 1st, and a Reply to Mr. Draffin's "Comparative Experiments of some of the Dry Processes," and "A Modification of Fothergill's Process, by which Sensitiveness is Increased."

I am again putting in an appearance on the "Fothergill Process" subject, even at the risk of the dire displeasure of your correspondent "Amateur;" not that his remarks are of themselves of sufficient importance to call forth a reply, but feeling occasion to do so to Mr. Draffin's paper, I will, *en passant*, notice the former also. With respect to the part relating more particularly to myself, and referring to my communication of April 1st, it is quite true that much therein contained had, at *various* times, previously appeared, but at the same time, much is given that had *not* before been made known, and a knowledge of which will, *under the circumstances named*, facilitate the successful practice of the process.

"Amateur" appears to have fallen into a mistake in supposing that because I have minutely detailed how the process may be practised with the *greatest success and certainty under almost every probable variety of circumstances*, it is not simple and easy. The precautions there recommended as regards state of operating-room, and use of artificial heat, are equally applicable, *under the same circumstances*, not only to the modification given by Mr. Lloyd, but *all* similar dry processes, including the Taupenot; they are however *not* necessary (with exception of draining on glass, which I would at all times advise) in summer, when the temperature is high and the plates dry quickly; the original simple instructions are then *ample*.

I have no desire whatever to disparage the mode of manipulation recommended by Mr. Lloyd (with a second edition of which "Amateur" has favoured us), for it is certainly very good. "Amateur" however errs, when he states that plates so prepared are *more* sensitive, as also in representing it so much more simple than that detailed by me. I have long since tried (when first experimenting on the process, and at a time when scarcely half a dozen knew of it—I may safely say before Mr. Lloyd—though all credit for any advantage it may offer is certainly due to him for publishing it), and found it answer exceedingly well, but the one I recommended equally so, both as regards sensitiveness, ease of manipulation, and certainty of result, and possessing the *additional advantage* of a *tougher and firmer film*, for which I considered few would object to the extra fifteen or twenty seconds required.

In his developing directions "Amateur" has departed from Mr. Lloyd's original, so far as relates to allowing the solution to remain *quite still* till details appear; this I have always found to produce ripple or wave-like dark deposits.

Now to the chief object of my communication, viz. — a reply to Mr. Draffin's comparative experiments.

The best possible *refutation* of inferiority of the "Fothergill process," intended to be proved by his paper, is the discussion that ensued on the reading of it, among the members of the Chorlton Society, more particularly the remarks of Mr. Hooper, who, with other members, not only gave testimony to the *superior* sensitiveness of Fothergill's over Taupenot's, but also that the *very specimens sent by Mr. Draffin to illustrate inferiority of former*, and superiority of latter, *proved the reverse*, the Fothergill specimen being full of *half-tone* and *detail*, while the Taupenot was *without* detail in the foreground; besides, in the latter, *developement was carried so far* that distant objects were almost lost.

The following, extracted from the many communications I have received, fully bear out the above:—

FROM CHESHIRE.

"I believe I have got *better definition* and *finer gradation of tone* by this process than any other I have ever tried, *the wet not excepting*."

GLOUCESTERSHIRE.

"Of all the dry processes which have appeared, none in my opinion, come up to the Fothergill, and I believe few amateurs have experimented more."

GLOUCESTERSHIRE.

"I followed implicitly your instructions, and my success was astonishing to myself; the *first day* I got pictures equal to any I ever saw. * * * I must say, again, with regard to success it is certain."*

In addition, I beg to enclose you a specimen — my own experiments being upon such uninteresting objects as the tops and backs of houses, &c., with the addition of tops of two or three trees — with which I was favoured by Mr. Ebbage, an amateur, whose success fully corroborates all that has been said in favour of the "Fothergill process." The specimen is soft, and full of half-tone; the water of the brook is entirely free from the harsh whiteness so fre-

* Mr. Keene has communicated to us the names of the writers of the letters from which the above extracts are taken.—Ed.

quent, and possesses every variety of shade; the grass on the bank is sharp and *well out;* while the distant trees, seen under the arch of the bridge, are not at all obscured.* The exposure was forty-five seconds, Ross's landscape lens, stop and focal length as described by Mr. Draffin. It may however be very justly said, this is neither twenty-five nor thirty seconds. True; but if a picture, chiefly foliage, can be obtained in the time named, few, I think, will doubt the possibility of obtaining one, in the shorter time, under the most favourable circumstances as to light and object photographed, as I have myself witnessed.

Mr. Draffin lays much stress on the advantages the Taupenot plates offer to those going on long journeys; this I maintain is quite a fallacy. Did the Taupenots possess the advantages enumerated of *non-injury*, by keeping or *exposure to light, when ready for use* the case would be altered; but to be obliged to take all the necessaries for sensitising, washing, and, if long away, developing, &c., equalling every thing, except collodion, required for the wet process, to say nothing of obtaining conveniences for performing these operations from home, certainly cannot be so very advantageous.

Mr. Draffin also lays some stress upon what he considers another advantage, viz.—the kind of collodion used for Taupenot's process not being of much importance—in fact, that any kind will do. My experience certainly runs counter to his here, having always found it difficult to meet with one that does not give blisters; for though one day it may not do so, yet the next, from some change in the state of the atmosphere or temperature, they may be far too plentiful, and the collodion most suitable is unfit for any other process. The reverse of this is the case with the "Fothergill," not only as relates to blisters, but the collodion suitable for it answers equally for the wet process.

In ease and celerity of preparation the Fothergill again has considerably the advantage. In preparing a Taupenot plate, it is sensitise, thoroughly wash with plenty of water, coat with albumen—here great care is required, to avoid air bubbles—dry, bake; then again sensitise, thoroughly wash with plenty of water, and dry. To prepare a Fothergill plate—Sensitise, dilute bath on surface with measured quantity of water (care required, that it may be done evenly), coat with albumen, well wash and dry; or, as suggested by Mr. Lloyd, sensitise, flush with *dilute* albumen, wash and dry; or where sensitiveness is not an object, sensitise, place plate for a minute in a basin of water, coat with albumen, wash and dry.

Developing—Here also the Fothergill has a decided advantage in the comparative shortness of time required, varying in summer from three to five or ten minutes, and in winter from fifteen to sometimes near sixty.

It is quite true many have failed with the Fothergill, but this has also been the case with every other process. Some have washed too much after sensitising and before coating with albumen, and so lost sensitiveness, which easily accounts for the discrepancies met with as to sensitiveness of process. Others, who have used the proper quantity of water, have either not continued it on long enough, or not carried it equally all over the plate, and so had stains. To ensure success, however, no more care and attention are necessary than in the practice of photography generally.

With these remarks I leave the Fothergill process in the hands of the photographic public, feeling confident that as its growth in public estimation has been, so it will continue, *excelsior! excelsior!*

In the above I have not taken into account the modification by which sensitiveness is so much increased; for though further favouring the Fothergill, yet not being known at the time Mr. Draffin made his comparative experiments, I have thought it not fair to take advantage of it in replying to his paper.

As many of your readers may probably not have seen the accoun of it sent by me to a contemporary, I will, with an apology to "Amateur" for the repetition, insert it here. A short time since a correspondent, who gave his initials only, called attention to the accelerating effect of muriate of ammonia added to the albumen; upon trial by myself and others, such proved to be the case, I think I may safely say, doubling it. No particulars were given, but the quantity I have found answer best is six grains to the ounce of either prepared albumen, or equal parts of white of egg and water (the former I prefer, as a quantity may be prepared at once, the ammonia preserving the albumen). The mode of manipulation is in every respect the same as without the addition.

I have also found a still further acceleration of sensitiveness by substituting for the albumen thin gum water, as follows:—White gum-arabic, ten drachms; muriate of ammonia, thirty-five grains; dissolved in six ounces of distilled water. This is to be used *instead* of prepared albumen, and in the same manner.

* The specimen fully bears out the description.—Ed.

SUBSTITUTE FOR COLLODION—CELLULOSE.

Since the discovery of a convenient solvent for cellulose, by M. Schweitzer (p. 80), the efforts of scientific photographers have been directed to making it available as a substitute for collodion, by which much of the uncertainty attendant upon the use of that complex body may be avoided. M. Van Monckhoven has addressed a letter to the editor of *La Lumière*, detailing his method of preparing the new vehicle, and the results attending its use. He employs a solution of cellulose (carded cotton) in ammonio-oxide of copper (oxide of cuprammonium). The oxide of copper may be prepared in the following manner:—In ten or twelve *litres* (17½ to 21 pints) of water, retained in a glazed or wooden vessel, dissolve one and a-half kilogrammes (3 lbs. 5 oz.) of commercial sulphate of copper. In another vessel dissolve one kilogramme (2 lbs. 3 oz.) of caustic potash in its weight of water, and then mix the two solutions together. The liquid becomes a bluish green mass, but by stirring it quickly with a glass or wooden rod, a precipitate falls to the bottom of the vessel, and in a few hours the supernatant liquid becomes clear. The liquid is drawn off by means of a syphon, and fresh water is poured upon the precipitate to remove the foreign salts (sulphate of potash or potassa in excess). After a few hours of repose the liquid is again decanted. This washing must be repeated three times, in order to obtain the oxide of copper quite pure; the deposit is finally placed in a linen strainer to drain; at the end of four and twenty hours the mass takes a pasty consistency. It is then removed from the strainer with a tin spoon or a plate of glass, and put into a wide-mouthed jar, and ten litres (17½ pints) of commercial aqua-ammonia poured on to it. The ammonia must be free from colour. Upon shaking the jar all the oxide of copper becomes dissolved, and forms a liquid of a splendid deep blue colour. After reposing twenty-four hours, decant off, say one litre, and put into it 100 grammes (3½ oz.) of carded cotton: that employed for polishing daguerreotype plates is excellent for the purpose. The liquid is shaken at intervals until the cotton is all dissolved, which is effected in a few hours; it is then diluted with a fourth of its volume of water. This forms the substitute for collodion. Its preparation may be stated by the following formulæ:—

No. 1.	Sulphate of copper	3 parts.
	Caustic Potash	2 „
	Water	10 to 20 „
No. 2.	Liquor ammoniæ	20 „
	Carded cotton	2 „
	Oxide of copper obtained from No. 1.	

The method of preparing the ammoniacal oxide of copper, as indicated by M. Peligot, is perhaps simpler than the above; it is as follows:—

Into a long narrow glass funnel, loosely covered with a piece of glass, put some pure copper turnings or filings, mixed with an equal quantity of fragments of glass, a portion of which should first be placed in the funnel, so as partially to choke the passage, and cause the liquid put into it to flow through slowly. Place the funnel in a large bottle, and pour over the copper a sufficient quantity of *liquor ammoniæ*. The copper, in contact with the ammonia and the oxygen of the atmosphere, is converted into oxide of copper, which the ammonia immediately dissolves, forming a blue liquid. When all the liquid has passed through the funnel it is allowed to remain for an hour for the copper to become completely oxidised, and then a fresh portion of *liquor ammoniæ* is poured into the funnel, repeating the operation until the liquid has acquired an intense blue colour. In this liquid the cotton is dissolved, as indicated above.

It is essential that the ammonia, in passing through the funnel, should flow into the bottle only drop by drop, else it will be imperfectly saturated with oxide of copper; and it must be allowed to settle before the cotton is dissolved in it, to avoid impurities. As the odour of ammonia is very disagreeable, this operation should be performed in the open air.

It is very important that this liquid be carefully prepared. To test it, pour a small quantity on a piece of glass—it should flow and spread itself slowly and regularly. With a solution that is too fluid no good result may be looked for.

This fluid is iodised with about one or two per cent. of iodide of potassium, dissolved in twice its weight of water. The glass plate is covered with it in the same manner as with collodion; the excess may be allowed to drain off on to a piece of blotting-paper, resting the plate against the wall. As soon as the liquid ceases to flow, plunge the plate into the following nitrate bath:—

Distilled water	100	parts.
Fused nitrate of silver	100	„
Glacial acetic acid	50	„

the film becomes white immediately; after a few seconds of immersion the plate is withdrawn and proceeded with as usual.

It is absolutely necessary that acetic acid be added to the nitrate bath, as it removes the excess of oxide of copper; at the same time it is well to diminish the quantity as much as possible. To an ordinary nitrate bath employed for collodion add one per cent. of acetic acid, and if, after developement, the proof is blackened, add another one per cent. of acid. If, however, there be too much acid, the rapidity of the process is diminished; if too little, the proofs are blackened.

An ordinary nitrate of silver bath will serve with the addition of a very small quantity of acetic acid—say, one-half per cent., provided the glass plate be allowed to remain immersed in it for two or three minutes, lifting it up from time to time; or the plate may first be immersed in water, acidulated with acetic acid, withdrawing it quickly, and when it has drained, plunging it into a neutral nitrate of silver bath. The time of exposure will be increased or diminished tenfold, according as the nitrate bath is properly adjusted which experience alone can determine.

To ensure success there is one point to be carefully determined—namely, When should the plate, coated with the iodised cellulose, be plunged into the nitrate bath, and how shall its action be regulated?

If at the expiration of half-a-minute after the plate is coated it be examined, it will be found that the upper part of the plate from which the liquid has drained has become opaline, while the lower part, still moister, remains transparent. If put into the nitrate bath in this state one portion will become whiter than the other, and, consequently, the action of the light upon it will be unequal. Therefore, before plunging the coated plate into the nitrate bath, it is necessary to wait until it has a uniform appearance, and to hasten it, the plate may be agitated for a few moments in the air; but if it be allowed to become dry its sensitiveness will be diminished.

Further experience may render this process still more certain: it is much simpler than that with collodion. Copper, ammonia, and cotton are cheap, and may be found anywhere, and it is not essential that these articles be strictly pure. This method promises success in the dry process.—*La Lumiere.*

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held at Myddleton Hall on Wednesday evening, the 25th ultimo.

GEORGE SHADBOLT, Esq., Vice-President, in the Chair.

After the minutes of the previous meeting had been read and confirmed, the following gentlemen were elected members:—Messrs. M. Beck, H. Bumsted, F. Lyon, and D. Wilson.

Photographic negatives and prints were exhibited by—

Mr. SHADBOLT: Fothergill process.
„ D. W. HILL: (Views in the Isle of Wight) modified metagelatine process.
„ T. A. BARBER: (Views) oxymel process.
„ M. HANNAFORD: Fothergill plates, and an almost instantaneous stereoscopic picture by modification of the same process, by the aid of *citrate of silver*.
„ GAMHAM: Some excellent stereographs.
„ BINGHAM: Negatives, and prints taken from them, the plates prepared with gum-arabic and chloride of ammonium.
„ BARNETT: Stereographs by metagelatine and Fothergill processes.
„ Dr. RILEY: Plates by several variations of the collodio-albumen process.

Mr. HISLOP read a paper, *Remarks on the Preparation of Dry Plates*, see page 135, for which a vote of thanks was accorded to him.

The discussion on Dry Processes was then proceeded with.

Mr. HISLOP considered that plates prepared by the processes he had described required at least one-fourth less exposure than Fothergill's.

Mr. MOENS corroborated this statement, but was of opinion that gelatine plates were generally deficient in density.

Mr. BINGHAM found that by using a very diluted solution of gum-arabic the collodion film adhered firmly to the glass, and by the addition of chloride of ammonium, not only were the plates rendered more sensitive, but another advantage accrued—they developed very quickly.

The CHAIRMAN asked if any member had followed the suggestion thrown out in consequence of Dr. Riley's statement at the last meeting, of coagulating the albumen film (applied after washing away the free nitrate of silver) by means of sulphate of iron.

Mr. DUTTON had tried separately both sulphate of iron and nitrate of silver for that purpose. He prepared two collodionised plates in the usual way, sensitised and *thoroughly* washed them; while still wet, he albumenised with plain albumen, and again washed them. One he then immersed in the nitrate of silver bath, the other *in a solution of sulphate of iron;* gave the final washing to both plates and dried; exposed to same object an equal time, and so equal were the results that he cannot even now distinguish which plate was treated with iron and which with silver.

Mr. HANNAFORD had tried similar experiments, and found the plate coagulated with iron came out apparently more dense, but there was in truth equal intensity as regards printing qualities.

Mr. D. W. HILL found no advantage over the ordinary Fothergill process by redipping in the nitrate bath, after Dr. Riley's plan.

Dr. RILEY stated that he claimed nothing in point of sensitiveness or density, but for *uniformity;* for with care, and washing off all the free nitrate of silver, clean pictures were certain results. He exhibited some plates upon which he had experimented in the following manner:—

No. 1. Redipped in nitrate bath: result (according to the general opinion of those present about thirty members), very weak.
„ 2. Iron bath: result, no density.
„ 3. Hot water alone: result, more dense but too weak to print from satisfactorily.
„ 4. Thoroughly washed and dried: result, the most dense of the four.

Each exposed two minutes; developed in five minutes.

The CHAIRMAN stated there was one question yet undecided, and that was, had any one completely washed off *all* the free nitrate, without converting it into a chloride or analogous compound, leaving only the iodide of silver? Was it clearly ascertained whether *pure* iodide of silver is sensitive to light or not? He felt by no means sure that it was a settled question.

Mr. MOENS replied that he had failed to obtain a picture on a plate that had been *thoroughly* washed with *distilled* water, but by adding a little salt to the water used for washing the plates, they were rendered very sensitive.

Mr. D. W. HILL stated that Mr. Moens had suggested the addition of chloride in the washing water, now so strongly recommended, more than twelve months ago. He was desirous of knowing if any member had tried washing the plates with a solution of pyrogallic acid before exposure, as recommended by Mr. Barnes and Major Russell?

The CHAIRMAN had done so, and developed that very day, just before attending the meeting, a plate prepared seventeen days ago, together with one not so treated: the only difference he found was a slight stain at the corner of that one treated with pyrogalic acid, where it had drained; there was *no difference* in intensity.

Mr. HISLOP was of opinion that the albumen solution as usually employed for preparing plates by the Fothergill process was very much too strong, and this was the frequent cause of failure. Albumen diluted with thirty times its bulk of water he found produced much better results.

The CHAIRMAN, in answer to a question as to the use of ammonia in albumen solutions, replied that it was preservative in its character, and greatly added to the even flowing qualities of the albumen.

Mr. D. W. HILL had tried the addition of chloride of ammonium to metagelatine with great success, and exhibited a good negative, taken in ten seconds by that process.

The CHAIRMAN stated that as this was the last meeting before the vacation, the Committee would be glad to receive offers of the loan of negatives from which to print the presentation photographs.

Any gentlemen willing to do so were requested to communicate with the Committee on this subject, through the Hon. Secretary, Mr. John Barnett, 9, St. Peter's Terrace, Islington, N.

Mr. SPENCER offered the use of any negatives he had for that purpose.

After thanks to those who had taken part in the discussion for the valuable information elicited,

The Chairman wished success to all present in their photographic pursuits during the vacation, and hoped to see a large collection of pictures, as the result of their labours, at the next meeting of the Association, which is arranged for September 28th.

A vote of thanks was accorded to the Chairman, and the meeting separated.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The seventeenth ordinary meeting of this Society was held on the 16th ultimo at the Golf Club-house, J. Glaisher, Esq., F.R.S., President, in the Chair.

After the usual business had been transacted, Messrs. Chatteris and J. Busk and Dr. Kidd were duly elected members of the Society.

The President proceeded to read a paper, which was a continuation of that commenced on the 21st of March, entitled "*The Application of Photography to Investigations in Terrestial Magnetism and Meteorology, as practised at the Royal Observatory, Greenwich.*"

Having described the apparatus by which the ray of light is concentrated upon the sensitive paper, enclosed in a glass cylinder, kept revolving at an uniform rate, by means of a chronometer, the rays of light from a lamp being reflected by a mirror (fixed by means of a stirrup upon the magnet, having free motion in a horizontal direction), through a lens arranged for the purpose on to the sensitive paper, the nature of the curves formed by the deflection of the magnet and the mode of calculating their value from a base line was described, the lecturer adverting to the "magnetic" storms which were on record, and showed that they are synchronous at various parts of the globe where observations are registered. He then proceeded to describe the following:—

Chemical Processes employed in the Photographic Operations for the Self-registration of the Variations in Position of Magnetical, and of the Variations of Readings in Meteorological, Instruments.

First Operation—Preliminary Preparation of the Paper—The chemical solutions used in this process are the following:—

1. Sixteen grains of iodide of potassium are dissolved in one ounce of distilled water.

2. Twenty-four grains of bromide of potassium are dissolved in one ounce of distilled water.

3. When the crystals are dissolved, the two solutions are mixed together, forming the iodising solution. The mixture will keep any length of time. Immediately before use, it is filtered through filtering paper.

A quantity of paper, sufficient for the consumption of some little time, is treated in the following manner, sheet after sheet:—

The sheet of paper is placed on a board, covered with oil-cloth, somewhat smaller on all sides than the paper, a condition necessary for preventing the iodising solution from running under the edges of the paper. The paper is usually pinned on the left side of the board. A sufficient quantity (about fifty minims for a sheet of paper fifteen inches long and nine and a-half inches broad) of the iodised solution is applied, by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution.

The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer till used.

Second Operation—Rendering the Paper Sensitive to the Action of Light—A solution of nitrate of silver is prepared by dissolving fifty grains of crystallised nitrate of silver in one ounce of distilled water, adding, in hot weather, a few drops of acetic acid.

Then the following operation is performed in a room, illuminated by yellow light:—

The paper is pinned as before, upon a board somewhat smaller than itself, and (by means of a glass rod as before) its surface is wetted by fifty minims of the solution. It is allowed to remain a short time in a horizontal position, and if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting paper.

The paper, still damp, is immediately placed upon the interior glass cylinder, and is covered by the exterior glass cylinder, and is mounted upon the revolving apparatus, to receive the slot of light formed by the mirror, which is carried by the magnet.

Third Operation—Developement of the Photographic Trace—When the paper is removed from the cylinder, it is placed upon a board, and a saturated solution of gallic acid, to which a few drops of acetic nitrate of silver are added (in hot weather this solution is used at the temperature of the air, in cold weather it is heated to the temperature of seventy or eighty degrees), is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. When the trace is well developed, the paper is placed in a vessel of water, and repeatedly washed with several successive supplies of water, a brush being passed lightly over both sides of the paper, to remove any crystalline deposit.

Fourth Operation—Fixing the Photographic Trace—The photograph is placed in a solution of hyposulphite of soda, made by dissolving four or five ounces of the hyposulphite in a pint of water; it is plunged completely in the liquid, and allowed to remain from one to four hours, until the yellow tint of the iodide is removed. After this the sheet is washed repeatedly with water, and afterwards placed within the folds of linen cloths till nearly dry. Finally, it is placed between sheets of blotting-paper, and a heated iron passed over it.

The paper concluded by details showing how—

From the original register, produced as above described, *negatives* are formed by means of the ordinary chloride plain paper process, in the pressure frame, the paper being impregnated with chloride of ammonium, and excited with ammonio-nitrate of silver, and after exposure being fixed as usual and ironed between sheets of blotting-paper. The negatives being thus obtained, any number of copies of the original register can be taken by a similar process for distribution and comparison.

At the conclusion of the paper Mr. Heisch remarked that the proportion of bromide to iodide of potassium was, as nearly as possible, two of bromide to one of iodide.

A vote of thanks was unanimously tendered to Mr. Glaisher for his able paper; and Messrs. Kent, Crossland, Skaife, and Kieser, having been proposed as candidates for future election, the meeting adjourned.

SECOND ANNUAL REPORT OF THE COUNCIL OF THE BLACKHEATH PHOTOGRAPHIC SOCIETY.

The lapse of another year brings round the Second Anniversary of the Blackheath Photographic Society, and the Council have the pleasure of presenting their Second Annual Report.

The Council heartily congratulate the Society upon its present prosperous condition.

During the past year, the Society's numbers have been recruited by the introduction of many of the influential residents in the neighbourhood, several practical photographers—and all zealous to promote the art of photography.

The Treasurer's Account is annexed, exhibiting a balance of £49, 11s. 2d. in favour of the Society.

The Soirée, which was held at the Mansion House, by the kind permission of the Rt. Hon. the Lord Mayor, on Friday, the 15th April, was eminently successful; and the works of Messrs. Glaisher, Heisch, Melhuish, Knill, Ledger, Smith, Spencer, Wire, and Wood, were such as to elevate the character of the Society from which they emanated. The following gentlemen contributed also materially as exhibitors to the success of the Exhibition, viz.—Messrs. Bedford, Bell, Bunning, Burfield and Rouch, Claudet, Cumming, Delamotte, Fenton, Frith, Horne and Thornthwaite, Jones, Knight, Ladd, London Stereoscopic Company, Murray and Heath, Malone, Negretti and Zambra, Ottewill, Paul Pretsch, Powell and Leland, Pillischer, Rayne, Reeve, Rosling, Ross, Salmon, Shadbolt, Smith and Beck, Thurston Thompson, Turner, White, Williams, E. G. Wood, and Herbert Watkins; to each of these gentlemen the Council beg to tender their warm acknowledgments.

Through the continued kindness of the Golf Club, the meetings of the Society have taken place during the past Session at the Golf Club House; the Council therefore offer their best thanks to the Officers of the Club for affording them a *locus standi*.

The following brief list of Papers read during the Session will show the energy and intellect which have been exercised on behalf of the Society by some of its leading members; and it is pleasing to record the fact, that the journals specially devoted to photography, and some of the local newspapers, have given a preference to many of the Society's papers in their publications, and by making them the subject of favourable criticism, have demonstrated their original and instructive character. The Council have to acknowledge, with many thanks, the great, nay, the special courtesy shown them by the press generally, and particularly by the editors of the local press, who have not unfrequently, during an unusual pressure of business, given insertion to, and notice of, the transactions of the Society.

The following is a list of Papers read during the Session:—

"On the Simultaneous Photography of various Coloured Objects." By Mr. Heisch.
"A Week with the Camera among the Hills of Kent." By Mr. Wire.
"On Nautical Photography," by Mr. Skaife, showing his "instantaneous method" of taking Photographs.
"On two main points in Photography." From Herr Paul Pretsch, read by the President; and, from the same source, a paper on Pretsch's "Photogalvanographic Process."

"On Metagelatine as a substance for mounting Photographs." By Mr. Heisch.
"On the Dry Collodion Process." By Mr. Heisch.
"On the application of Photography to investigations in Terrestrial Magnetism and Meteorology, as practised at the Royal Observatory, Greenwich." By Mr. Glaisher.

The Council regret that so few strictly scientific researches have this year to be reported, as from these only can fundamental improvements be expected. M. Nièpce de St. Victor continues his experiments upon the so-called storing up of light. Without absolutely ignoring his facts, a careful examination of his experiments, as reported by himself, convinces the Council that they by no means justify the theory he has raised on them. The fact, that the bodies supposed to contain the bottled light exercise their reducing action only through porous substances, such as paper, and have no action through glass or other non-porous substances, however transparent, while the reducing action of light passes most easily through transparent bodies, quite independently of their porosity, —coupled with the admission by M. Nièpce, that heat, vapour of water, and any thing which favours the passage of vapours through such substances as paper, materially assist, if indeed they be not essential to the supposed new action—render it more than doubtful if light have any thing to do with the matter. It is also worthy of remark, that none of those accustomed to scientific investigation, who have attempted to repeat his experiment, taking the most moderate precautions against self-deception, have ever succeeded; while Mr. Crookes has shown that at least one of his experiments is quite as successful with substances that have been kept rigorously in the dark. On the whole, the Council see no more reason for ascribing the effect produced by M. Nièpce to light, than they do for attributing anastatic printing to the same agency, because the nitric acid employed in that process penetrates the white parts of the paper, and attacks the zinc plate beneath them, while it does not attack those parts which are covered by the ink. In another direction, however, M. Nièpce's experiments seem to have led to more satisfactory results. He has added to the number of substances which receive an impression from light capable of after-development, and the Uranium Printing Process, founded on these experiments, promises to become of some importance. M. Chevreul, in an appendix to M. Nièpce's last paper, points out the necessity of distinguishing between such substances as are acted on by light alone and those which are only affected when oxygen is present; and gives a list of those substances on which light acts "in vacuo," of those on which it only acts in the presence of air, or of oxygen, or of those bodies in conjunction with moisture.

The Council must also bring under the notice of the Society Mr. Pouncy's Carbon Printing Process; for though they can by no means agree with him in his assertion that his prints are quite equal to silver ones, the immense strides he has made, in a comparatively short time, render his process one of great promise. At the same time, the Council cannot but remark that the conclusion that the prints must be as permanent as those made with printer's ink, because in both carbon is the colouring matter employed, has been much too hastily arrived at, as it has yet to be proved that the glue and bichromate of potash employed as a vehicle is as unalterable as the oil, resin, &c., which enter into the composition of printer's ink.

The discovery of Mr. J. H. Young, that the invisible image on a collodio-albumen plate can be developed, after the removal of the iodide of silver, by hyposulphite of soda, or cyanide of potassium, is too important to be passed over without notice, showing, as it does, that the change produced in the iodide of silver by light is even greater than has hitherto been thought. At present, it does not appear that he has produced any but transparent positives, printed from negatives by superposition; so it remains to be seen if the comparatively feeble light of the camera is capable of producing the same effect.

The Council would take the opportunity of reminding Members of the forms for the registration of observations with which they were last year furnished, none of which appear, up to the present time, to have been filled up. They would press upon Members the necessity for a little exertion on this point, as it is only by a comparison of a number of observations, made in different places, and under various other considerations, that any good results can be hoped for. With a view to facilitate these observations, Mr. Heisch has prepared shorter forms, embodying only the most important points, and those which can most easily be attended to in the field.

The new forms of lenses are still exciting much discussion. The Members have had some opportunity of judging of the results obtained with them at the late exhibition at Suffolk Street. The pictures by Mr. Bedford were mostly taken with a Grubb lens, those by the late Mr. Howlett with a Ross Petzval.

The Society, since the publication of the last Report, have to regret the loss of several Members, from various causes, chiefly through removal from the neighbourhood, among whom should be especially noticed the name of G. Busk, Esq., F.R.S. The Council record the secession of such with regret. While acknowledging with thankfulness the labours of those Members, who in the midst of important avocations have kindly devoted their time to the production of papers for the intellectual gratification of the Society, the Council have to urge upon other Members the necessity of contributing somewhat to its intellectual maintenance, recording their opinion that a failure in this particular presses somewhat unfairly upon those gentlemen who have already exerted themselves so much in that direction. In conclusion, the Council point with satisfaction to the position the Society has obtained in public estimation, and venture to add that such combinations cannot fail to exert a beneficial influence upon the community at large, fostering, as they do, two important principles, viz., the extension of scientific information and original research, and the bringing together, for that result, those who are desirous of cultivating knowledge.

Exhibition.

GLASGOW PHOTOGRAPHIC SOCIETY.

[FROM OUR OWN CORRESPONDENT.]

ALTHOUGH this Society's exhibition is now closed, the following analyses of the subjects and processes represented may be interesting:—

SUBJECTS.

Portraits, numbered	259
Studies and compositions from life	62
Landscapes: Views from nature and architectutal subjects	441
Stereographs: Chiefly views from nature and architectural subjects	125
Astronomical: The moon in various phases	4
Microscopic enlargements of minute objects	17
Microscopic reductions of engravings, &c.	20
Machinery	6
Copies of engravings	40
Copies of paintings	17
Sculpture	8
	999

PROCESSES.

Collodion: Of this there were pictures to the number of	642
Honied collodion	12
Collodio-albumen	71
Hill Norris's process	8
Fothergill's process	1
Mr. Kibble's experimental dry process	10
Collodion positives on glass	57
Collodion on leather	1
Albumen	93
Talbotype	16
Waxed-paper	56
Daguerreotype	1
Not ascertained	31
	999

I may add that the collection was admirable, and contained fine pictures by Fenton, Lyndon Smith, Robinson, Rejlander, B. B. Turner, and most other well-known artists. There was a marked progress in artistic feeling to be seen throughout the collection as compared with the last exhibition held in Glasgow. More attention is evidently being paid to pose and expression in portraiture; to the selection of the best point of view in landscape and architectural subjects; and in all, to an advantageous disposition of light and shade. Then we had very fair attempts at art itself, in such efforts as the studies and compositions of Robinson, Rejlander, and Fenton.

Judging from this exhibition, collodion, and next to that, honied collodion, seem to produce the most desirable effects in the way of securing sharpness and detail, along with softness and half-tone. Fothergill's and Norris's processes were insufficiently represented. Taupenot's process was generally harsh and too snowy in the lights, but there were some beautiful exceptions to this rule. B. B. Turner's pictures showed well what could be done by Talbotype. Excellent results were exhibited in views from waxed-paper negatives, by the Rev. Mr. Raven and others. This process seems to be admirably capable of securing distance. With these brief remarks I must close. OBSERVER.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER III.

UPON COLOUR.

ALL colours have their origin in the decomposition of light, which is, in its perfect or entire state, colourless. Newton first proved the compound nature of the solar beam, and traced all the varied hues and colours of nature to the seven rays of the prismatic spec-

trum; but of these only three are now generally admitted to be really primary, viz.—red, blue and yellow. As pigments, artists always considered these three colours primary, because, by no combination of pigments could they be produced, but by uniting the three named, or some of them, in different proportions, all other colours could be obtained.

Black and white represent, in nature, the absence and the presence of light; and to colours in nature, or as they exist as pigments, black and white bear much the same relationship; darkness (the absence of light) is in the same proportion the absence of colour; so black, its representative, degrades pigments from their native purity and brilliancy. On the other hand, white is in pigments, as in nature, the representative of perfect light, although the brilliancy of a white pigment cannot be of course compared to that of white light—to force the effect of white by contrast is therefore a point of some importance, as in reference to light and shade I pointed out in the last chapter.

"Colours," Opie says, "are the sunshine of art that clothes poverty in smiles, and renders the prospect of barrenness itself agreeable, while it brightens the interest and doubles the charm of beauty." In appealing to the mind, no assistance is more powerful than colour; a picture in light and shade may be effective and suggestive, but it grows tame and poor when contrasted with one of the same subject, executed with equal skill, in colour.

What speaks so eloquently of health as the hue of ruddy freshness glowing through the clear firm flesh? or of disease, as the sickly pallid tint which overspreads the emaciated form? The wild storm is most felt through the gloomy hues of sky and landscape; and what can express the misty romance of dying day so well as the purple shadows, and the clouds of gold and crimson which glow in the horizon, beneath the darkening violet of the solemn sky above our heads? Colour is quite as important in portraiture, and more especially photographic portraiture: the healthy red, the pallid, the sallow, the beautiful pink and white, or the sickly complexions, are as vital to *truthful* resemblance as form itself; and the colours of the eyes and hair are of no less importance. Here photography does very frequently fail: the red colour upon the cheek it represents by *a shadow;* the pale blue eye, melting in liquid light and full of tender beauty, is very frequently in the photograph misty, indefinite, expressionless, and *barely visible,* and the rich auburn hair *black.* I do not say, with many, that this is *necessarily* the case: I do not believe it is; but it is *very* common to see such defects, and will be so, I fear, until the principles I urged upon the reader's notice, in the preceding chapter, be generally studied and carefully applied.

PRIMARY AND COMPOUND COLOURS.

Of the three primary colours (red, yellow and blue), yellow is the most nearly allied to light (or white), and blue to darkness (or black); by mixture, we obtain from these colours orange, green, and purple—the first by the mixture of red and yellow; the second by yellow and blue; and the third by blue and red. From these we derive a third set of compounds, viz.—citrine, a mixture of green and orange; russet, of orange and purple; and olive, of green and purple.

To understand the full value of colours and their hues, we must look upon them as representative of certain qualities, viz.—warmth and coldness, light and shade; the power of harmonising and contrasting; of expressing sentiment, local character, breadth and relief; of advancing and retiring; in short, of powers which (apart from mere local characteristics) it is impossible to over estimate in their relation to the higher order of artistic effects.

(To be continued.)

Letters to a Young Photographer.

No. XI.

MY DEAR EUSEBIUS,

So you cannot develope your picture? The developing mixture I prescribed will not flow over the plate, no matter how you coax it? Well, there is a remedy for most human ills, except impecuniosity; and, perhaps, I can help you to a solution of your developing difficulty. It is supposed that the reason why the developing solution will not flow over the collodion consists in the presence of the ether in the collodion: this may be got rid off, to a great extent, by moving the plate up and down several times while in the nitrate bath; but if you add about one ounce of alcohol to the developing formula I gave in my last, I have no doubt, when you next try it, your developer will flow as freely as you can wish. I have learnt to do without the alcohol myself, but it was only after the expenditure of much patience, more, perhaps, than in your present stage of initiation you will care to bestow. It is quite essential to the obtaining of a good negative that the developer should spread promptly, for, if it remains upon one part of the plate and not upon the other, the process of development will go on unequally, and no subsequent care or pains will make it right. The skill required will come to you by practice, aided by a determination to succeed: so be not discouraged by early difficulties.

When you are satisfied that the developing is effected, wash off the solution with a gentle stream of water, poured from a pint jug: your next proceeding is to fix the image, which consists in removing all the iodide of silver from the collodion, by means of suitable solvents: these are—hyposulphite of soda and cyanide of potassium.

There is not much choice between these two solvents; both have their objections, and they should not be used in the operating room, on account of the inconvenience to which they are apt to give rise. I have a great horror of hypo, for it gets upon your hands, and if you touch anything while they are soiled with it, no end of mischief occurs: for this reason I give the preference to cyanide of potassium. But I shall describe both to you, and then you will be able to choose for yourself. Take a pint bottle and fill it nearly with water, and make a saturated solution of hypo by putting into the bottle as many crystals of this salt as will dissolve. You can pour from the bottle as much of this solution on to the plate as will cover it. The yellow iodide of silver will be seen to gradually disappear, the plate becoming transparent when it is all dissolved. When this has taken place, the plate must be washed for five minutes under a gentle stream of water, to remove all the hypo. A prolonged washing with hypo is very necessary, for if any be allowed to remain in the collodion it crystallises when the film becomes dry, and the picture is destroyed. If the plate is thoroughly washed from all traces of the developer, the image will appear positive as well as negative; but if the washing be imperfectly performed, and any traces of acid are retained by the collodion, when the hypo is poured upon it, it is decomposed, and a quantity of sulphide of silver is formed, which prevents the picture from assuming a positive aspect. This effect never follows the use of cyanide of potassium, which, containing no sulphur, always yields positive pictures when they are held over a black ground. I think all the advantages which may be attributed to the use of hypo are more than counterbalanced by the inconveniences arising from its use.

To fix with cyanide of potassium dissolve one ounce of this salt (if pure) in five pints of water. Pour a sufficient quantity of this solution upon the plate to cover it: its action is very rapid, and must be carefully washed. As soon as all the iodide has disappeared, wash the plate under a gentle stream of water, and set it up to drain.

A decomposition of the cyanide takes place during the developing, and vapours of prussic acid are liberated, which are injurious to inhale. You will, therefore, exercise due caution in making use of this dangerous fixing agent.

When the plate is carefully washed free from the developing agent, lean it against the wall, resting upon a slip of wood, to drain and dry. The time this operation requires will, of course, depend upon the weather; but if you are in a hurry, you can hold it before a clear fire. When quite dry, the plate is ready for varnishing. The best varnish for collodion negatives is that made of white lac. Take

Alcohol	10 ounces.
White lac	1 ounce.
Essence of lavender	2 ounces.

The lac will dissolve in a few hours; but previously to its being put into the alcohol it must be broken into small pieces, and carefully dried in an oven or in the sun. In the process of bleaching yellow lac water becomes enclosed within cells formed in the body of the resin, and, entering into the varnish, will cause the appearance upon the plate termed *blooming.*

You will make the plate quite warm (not hot) before the fire, and have the varnish warmed also; pour it over the plate in the same manner as you do collodion, and when it is quite covered return the surplus to the bottle, and set the plate to dry, out of the dust.

The quality of a varnish must necessarily depend upon the resin of which it is composed, and also upon the solvent employed to dissolve it. As to the resin, to be fit for photographic purposes, it must be hard, colourless, and transparent; a resin like mastic or dammar is too soft and brittle, and so is any resin that can be easily crushed under the finger-nail. If you require to print many posi-

tives from a negative, it is a matter of very great importance that the varnish with which it is covered be tenacious. A very little friction will rub off in a state of fine powder such resins as mastic. After many experiments, I have found no varnish so tough and adherent as lac; it never becomes *tacky*, even when the negative is printed in the heat of a summer's sun. A very good varnish may be made of gum benzoin, one ounce of which, dissolved in ten ounces of alcohol, and filtered, gives a very solid, clear, tenacious varnish, which is the next best to lac. Beware of the chloroform-amber varnish: I have lost several valuable negatives by its use. The amber softens in the heat of the sun, and the negative adheres to the positive paper.

The solvent of a resin should be a completely volatile substance; alcohol, ether, chloroform, and camphine are of this class. Common turpentine, a very good solvent for many resins, contains itself a portion of resin, which frequently gives a tackiness to varnishes; it must never be thought of for photographic purposes. Camphine, which is highly rectified turpentine, should always be preferred.

I have spoken of varnishes under the supposition that you will require to print a good many positives from your negatives. If you only require to print one or two there is no need to varnish your negative at all if you handle it very delicately. You may use gum-arabic as a varnish, making a solution of one ounce of gum in ten ounces of water, and straining through fine muslin, or what is better, tying up the gum in a muslin bag, and suspending it in a bottle or jar of water. Albumen makes a very good varnish; it is very tough, and keeps the "darks" in all their pristine opacity. I do not know but what I prefer albumen to any other thing for a varnish, now I come to think of it, but why I have not made greater use of it I cannot tell. I shall take it into favour again immediately. You will cover the collodion plate with the albumen while it is still wet, and when it is quite dry immerse the plate in the nitrate of silver bath (for exciting), in order to coagulate the albumen. Wash the plate carefully, and then pass it into a weak solution of hypo to remove any traces of nitrate of silver that may remain; then wash the plate again and dry.

ERRATUM in last letter, page 128, in formula for developing with sulphate of iron—

For "solution of sulphate of iron *ten* ounces" read ONE ounce.

Photographic Glossary.

Mercury; Quicksilver—A metal remarkable for existing in a liquid state at ordinary temperatures. It is of a silvery aspect and without taste or smell. It boils at 660° and is converted into a dense colourless vapour. It combines with oxygen, chlorine, bromine, iodine, sulphur, and most of the metals, forming *amalgams*. Mercury is the developing agent in the daguerreotype process.

Metagelatine—A name given to gelatine which has lost its property of solidifying, or becoming gelatinous: a change effected by boiling gelatine with a diluted acid. It is employed in photography to preserve collodion in a moist state in the same manner as honey.

Methylated Spirit—A mixture of 90 per cent of spirits of wine, sp. gr. 0.830, with 10 per cent of purified wood-spirit. This is an economical substitute for alcohol in the preparation of ether, chloroform, varnishes, &c.

Mica—A transparent mineral which occurs in laminated plates, which are hard and flexible, and may be split into thin flakes. It is a frequent substitute for glass, and is employed in photography for protecting pictures in lockets, &c. It is a silicate of lime combined with silicate of alumina.

Micro-photography—Applications of the microscope to the art of photography, one of which consists in taking pictures of objects on so small a scale as to require a powerful magnifier or microscope for viewing them. Although mostly used as a toy, this kind of ingenuity could be turned to useful account in the time of war, as despatches might be rendered on so small a scale as to ensure perfect secresy even if the bearer were arrested. The other branch of micro-photography, or more properly photo-micrography is of high scientific interest and utility = consists in producing highly magnified images of minute objects, as they appear under the high powers of a microscope.

Milk—A white liquid secreted by the mammallary glands of the females of various animals. It is a very complex substance, consisting of a multitude of fatty globules, which upon repose rise to the surface and form cream, and of another substance termed *casein* (cheese), which may be separated from milk by the addition of acid, the other portion being *serum* or whey, which consists of a solution of sugar of milk and albuminous matters. The serum is employed in photography as a solvent of the iodides; the albuminous substances it contains together with the sugar of milk act as an excellent sizing material.

Muriatic Acid—A name given to Hydrochloric acid, which is also sometimes called spirits of salt.

Nickel—A white metal, much employed for making alloys with copper, which it renders white also. The iodide and bromide of nickel have been used with satisfactory results for iodising collodion.

Negative—Photographic pictures;—so called in consequence of the lights and shadows and position of objects being the reverse of what they appear in nature. The images of objects received in the camera are always negative. This term has been greatly objected to by scientific writers, who propose to substitute for it the term *inverse*.

Nitrates—Compounds formed by the union of nitric acid with bases. The most important nitrate in photography is the nitrate of silver.

New Books.

Love Letters of Eminent Persons. By CHARLES MARTEL. London: W. Lay, King William Street.

WE feel convinced that Mr. Martel is a photographer; the selection of his publisher declares it, and though he speaks personally but in six short pages of introductory matter, the same idea obtrudes itself upon the reader. If not, why does he send us his book for review, for we cannot find anything about photography in it? What an immense accession of interest would have been gained had it been possible to have published with the letters, photographs of the writers. We commend this idea to him; and although it is now impossible to photograph the originals, authentic portraits of many, if not most of them, are to be found, and photographic copies of these would materially enhance the value of the text.

Foreign Correspondence.

Paris, May 24, 1859.

PHOTOGRAPHIC activity has suddenly taken a new phase; its impulses are all for Italy, and happy is the artist whose *atelier* contains a good stock of negatives from Sardinia, and other Italian states now the centre of interest and of strife. If I stroll along the Boulevards, I see no photographs in the *magasins*, but views of Turin or Genoa, or Milan, or Venice; or portraits of Victor Emmanuel and Count Cavour. War enthusiasm is raised to such a pitch, it is really quite infectious. I caught myself this morning asking for six ounces of gunpowder, when I really wanted collodion. I have some compunctions in using gun-cotton, when I think how useful it might be to those who are fighting for their liberties; I hesitate to make any more of it, because the nitrate of potash may be required for making gunpowder; I look at my bright brass objective, and wish it were a rifled cannon. If I whistle, it is always the new tune, *Viva la Liberta*. When I meet a chum in the streets the only salutation I receive is, "When are you off to the war?" Nothing but my deep and sincere devotion to the interests of *The Photographic Journal* keeps me here. The army is well equipped with its staff of photographers. I could have been one among them, but here I remain to chronicle the silent but onward march of photography. I hope you will at least give me credit for self-denial; for, if the war goes on, I shall soon be left here alone, the last of the peripatetic photographers.

Photographic engraving has made a new stage of progress under the hands of M. Bershtold, who has sought to remove a radical defect inherent in the methods of engraving by light hitherto employed, which is the want of *grain* in the plate. M. Talbot sought to remove this defect by the use of powdered rosin, but the grain so produced being of equal texture throughout the surface of the plate, produces a disagreeable flatness. M. Bershtold produces a kind of *hatching*, which is distributed just where it is wanted in the desired quantity. His plan of operating is to prepare a glass plate, by covering it with an opaque varnish: by ruling the entire sur-

face with a fine point, an infinite number of lines very close to each other are produced. When the metal plate endued with the sensitive preparation is submitted to the action of light, and the image impressed upon it, before it is washed, this ruled glass is placed upon it, successively, in various directions, horizontal, vertical, and diagonal, and exposed to the light. Upon those parts of the sensitive compound which have received the action of light, and become insoluble, no new effect is produced; but in those that are not, an infinite number of cross hatchings is produced by the light passing through the lines in the ruled glass. Although the experiments are at present but very imperfect, the results are exceedingly encouraging, and will doubtless lead to great improvement in future operations. M. Niépce de Saint Victor has announced a new process for obtaining black proofs, without the employment of the salts of silver or of gold. He takes one of those red pictures described in my letter of April 23rd (page 114), and turns it into a black one, by immersing it in a solution of per-chloride of iron, of the strength of five per one hundred, to which one per one hundred of pure hydrochloric acid has been added. In the course of a few seconds the proof becomes of a greenish black; it is then removed from the iron solution and rinsed in pure water; it then acquires a fine black tone, which it retains when dried. It must not be left too long in the water, especially if the water is a little alkaline, else the proof will take a rusty black tone: proofs obtained by this method are very beautiful, the whites very pure, and the half-tones well graduated. MM. Davanne and Joüet have presented some observations upon obtaining pure whites in direct positives on collodion. They propose nothing new, but substitute a purely chemical formula for the empirical ones in general use. They say that, in order to obtain pure whites, it is necessary that the particles of silver deposited, forming the image, be as pure as possible. This purity will depend upon the quality of the developer. Their improvement consists in adding to the iron developing agent sulphuric acid, in a quantity equal to one-fourth of the weight of the sulphate of protoxide of iron employed. A soluble sulphate of iron is produced which, unlike the sulphate of the peroxide formed in the usual method, is washed away from the collodion, instead of being precipitated with the silver, and so forming a discoloured image.

The report on the prize offered by the Duke de Luynes has been presented by M. Perier. It is a very lengthy document. I can only give you the results. The prize is not awarded to a single individual, but is apportioned as follows, in gold and silver medals of the value indicated:—

M. John Pouncy	400 francs	(silver).
MM. Garnier and Salmon	400 ,,	,,
MM. Davanne and Girard	600 ,,	(gold).
M. Poitevin	600 ,,	,,

It will be remembered that the prize was offered for the best method of securing the permanent positive impressions on paper, under the following conditions:—

Verifying, with respect to accidental fading, of a certain number of proofs.

Admission in theory, under certain conditions, of the possibility of fading, of proofs of any kind.

Greater utility of researches tending to render every picture, if not permanent, at least as durable as the products of printing, engraving, and lithography, have hitherto proved.

It was generally conceded at the time this prize was offered, that it was to carbon we should look for the desired permanent printing agent; and it will be seen that two out of the four medals have been given for processes of carbon printing. Much of the discredit thrown upon processes for printing with salts of silver has arisen from the careless manner in which the proofs have been treated, both in toning and in washing, chiefly by persons ignorant of the nicety and care required by chemical operations: such artists have supplied the large crop of faded photographs which abound on every side. There are abundance of good proofs extant, taken many years ago, which, carefully treated in all the various manipulations to which they have been submitted, exhibit every promise of continued permanency, having during the time they have already existed, undergone no visible alteration.

The report first specifies those candidates who put themselves out of court by not complying with the conditions imposed upon competitors for the prize. This left four candidates, whose several claims to the prize were so nicely balanced, that is was divided between them.

M. Pouncy's carbon-printing process is identical in principle with M.M. Garnier and Salmon's, and nearly identical in the details of execution with that of M. Poitevin. The peculiar modification of M.M. Garnier and Salmon's process, consists in their applying the carbon in powder after exposure to light. They commence by dissolving 30 drachms of loaf sugar in an equal weight of water, then adding 7½ drachms of neutral bichromate of ammonium dissolved in a glass mortar. Then add to this compound 10 drachms of frothed albumen, to which a few crystals of bichromate has been added, mix these ingredients thoroughly together, and strain through fine muslin. Fasten a sheet of paper to a small board, and spread the mixture upon it with a large round hog's-hair tool, taking no more of the liquid than is just sufficient to cover the paper equally, thus avoiding streakiness. It is next dried before the fire, and then exposed in the printing-frame under a positive. The exposure required in a cloudy day will be about fifteen minutes. Upon removing the paper from the frame the image will appear of a yellow brown colour, deeper than that of the bichromate; it is then warmed before the fire, heat appearing to continue the action of the light, by which the intensity of the picture may be in some measure regulated. The paper being again fixed upon a board, spread by means of a flexible brush a coating of fine ivory-black; this pigment is preferable to lamp-black. The operation is finished by spreading the black evenly by a tuft of cotton; the paper, removed from the board, is held before the fire for a few seconds, and then plunged carefully, picture uppermost, into clean water, in which it must be moved about carefully, and then left to repose. In about a quarter of an hour it may be taken out very cautiously and hung up by two corners to dry. The whites will appear rather tarnished. Lastly, the proof is put into a bath containing 5 parts of a concentrated solution of sulphurous acid to 100 parts of water, exercising the same care in this bath as in the preceding. The whites will now appear nearly pure, some particles of carbon still adhere to them, and the principal difficulty to be overcome in this process is to obtain pure whites; at present the proofs are imperfect in the half tones, the distances and other delicate parts in a landscape are imperfectly expressed, often undecided and ill defined, and the shadows want depth and homogeneity. The manipulation of this process is not so simple as in that of M. Pouncy, but much less time of exposure is required, while the results are nearly equal in both methods. M. Pouncy's method has the advantage of permitting the employment of a negative instead of a positive, as required in Messrs. Garnier and Salmon's process.

The committee of inquiry consider that M. Poitevin is the real originator of the processes based upon the employment of bichromates, he having announced his method in August, 1855.

Messrs. Davanne and Girard received a prize for their valuable researches upon the philosophy of positive printing, which, as they have been duly recorded in the pages of *The Photographic Journal*, I need not recapitulate.

J. P.

New York, May 11, 1859.

On the evening of the 9th instant the Photographical Society had a meeting, for which many *invitations* were issued — if not to followers of the art, to its patrons—at least, so far as having each one some time or another sat for a map of his face. The *pseudo-claimant* of the process of taking daguerreotype portraits was in the chair, he being the *de facto* president of the Society; but having been a Professor in an University, he has been placed over the head of the real producer of the first portrait from life ever taken by the camera, who is in a very subordinate situation in the Society. *Brass* is a very valuable commodity in America as well as elsewhere.

Mr. Seely read two papers — one on *Dry Collodion*, in which he clearly set forth the importance of "Seely's pyroxyline," dissolved in his "Photographic ether" and the "photographic alcohol," all of which articles are "well known to readers of *my* journal." The second paper was on *Sensitising Albumen Paper*.

A young gentleman described a new method of darkening collodion negatives, by using proto-chloride of palladium.

Mr. Seely exhibited the *original and new* process of detaching the collodion film from the glass. Several detached films were handed round. After this, followed a discussion on the sunflower, and on love apples; of the last of which, Mr. Snelling, the ex-editor, declared he was very fond. Mr. Seely also took part in this question.

A proposition was made to the effect that some one rich enough should offer a premium for the best formula for making dry collodion, which should be more sensitive and much more pleasant to work than *wet* collodion. This premium to be called the Society's prize, and to be awarded by Mr. Seely.

Copies of the "*constitution*" of the Society were given to all present who would receive one, and the meeting then adjourned, to meet again on the second Monday in June.

A change is gradually taking place in the *personnel* of the art in the public establishments. In some few of them young ladies are the printers; and it must be said in their favour, that the prints produced by them are not surpassed by any, even if equalled, either in clearness of tint or gradation of tone. Female hands and tact appear better adapted to the delicacy of the necessary manipulations on the tender paper than those of the other sex, none of whom are fond of dabbling in water — consequently, are apt to slight the use of it.*

We hear no more of the Cutting injunctions, but we have an advertisement going the rounds, cautioning every one to avoid infringing on a patent of *Whipple's*,† "for taking pictures on glass plates," of an earlier date than Cutting's; thus cutting even Cutting out, as Cutting can only use his patent on cut-glass plates.

Photographic weather is still, for out-door operations, as great a desideratum as when I last wrote to you. Rain, high winds, dust, rain, high winds, dust, has been the rotation for a long time back, and the torrents falling at this moment would almost induce the idea of another deluge being at hand. ARGUS.

Correspondence.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

ENLARGING BY A PATENT (!) PROCESS.

To the Editor.

Sir,—The enclosed paragraph was cut from to-day's impression of one of our local papers:—

"Improvements in Photography.—Messrs. ——— and ———, who have hitherto done so much in bringing photographic portraiture to a high excellence in Liverpool, seem determined not to be outdone in the race for public favour. By the purchase and adoption of an American patent, just introduced to this country, they are enabled from the smallest negative to reproduce portraits of any dimensions up to life-size, and this without, in the least degree, lessening the sharpness of outline or the clearness of detail that belong to their smaller pictures. We have before us at present one of the first portraits enlarged by the new process, and it is, indeed, a marvel in photography — preserving the fidelity of the miniature with the artistic excellence of a large mezzotint engraving."—*Liverpool Daily Post.*

I should much like to know if the so-called American patent is one of the "*American patents*" that we have been so much favoured with for the last year or two, obtained for new (!) inventions of processes, &c., which have been published here or elsewhere—in some cases even years before. Any one who has had the smallest experience in photographic manipulation ought to know how to produce a picture any size from a negative, no matter how small, without losing any of the detail.

Although a sincere admirer and ardent practiser of photography, I do not follow it for a living; but if I did, I am afraid I should be very much inclined to be the first to infringe the "*American patent*" right.—I am yours, &c. CRAM.

Liverpool, May 25, 1859.

[As Mr. Squeers said to Nicholas Nickleby, "Dotheboys Hall is not *exactly* a *hall*," but there is no act of parliament against a man's calling his house an *island* if he please;" so photographers can, if they please, vilify their own productions, by dubbing them *patent*.—Ed.]

TONING AND FIXING.

To the Editor.

Sir,—As "reform your toning baths" seems to be the order of the day, I have made one according to the formula of M. Bayard, given in your January number, on page 11. I find that the *fixing* bath is only composed of five *drachms* of hypo to thirty-three ounces of water; while, on page 4 of the same number, Hardwich's fixing bath is *six ounces* of hypo to one pint of water. I should, therefore, be greatly obliged if, in your next number, you would say if Bayard's fixing bath is given correctly? If it is, do you think it is sufficiently strong to be used for any length of time?—I am, yours, &c. F. B. E.

May 18, 1859.

[The fixing baths are both given correctly; but that of M. Bayard is not intended to be used for any length of time, but a fresh bath made every day, or as often as the operator may be printing. We prefer Mr. Hardwich's and Mr. F. M. Lyte's formulæ to M. Bayard's. Mr. Lyte's, especially, is pleasant to work with.—Ed.]

* We doubt not the advantage of female manipulation, but cannot assent to the importation of *mild hydrophobia* on the part of our own countrymen.—Ed.

† Whipple's albumen process is so patented.

DIAPHRAGMS BETWEEN LENSES.

To the Editor.

Sir,—I have been lately using a portrait lens, stopped down with a small diaphragm, *between* the lenses, for views; but nearly all my negatives are spoiled by a circle of light in the centre of the picture corresponding to the size of the diaphragm used. I have tried various means to obviate the difficulty, but have as yet failed.

Will you, through the medium of your valuable journal, explain the *cause* and *remedy* for this evil?—I am, yours, &c.

ONE IN A FIX.

[The cause is, probably, a partial cutting off of the oblique rays by some part of the fittings, probably by too long or too contracted a sun-shade in front of your lens: the remedy is obvious, if our conjecture be correct. The diaphragm is also, probably, not in the right place: it should be nearer to the front than the back lens, say two-fifths of the distance between the lenses from the front combination. See also reply to Lux.—Ed.]

MANIPULATORY DETAILS.

To the Editor.

Sir,—I have seen some photographic prints mounted on card-board, with a beautiful hard smooth surface. This effect was accomplished by means of a *press*.

Would you be kind enough to inform me, through your valuable journal,

1st. What kind of press is best adapted for the purpose, and where are they to be purchased?

2nd. The best method of masking negative portraits, and printing in plain backgrounds?

3rd. The paper best suited for portraits to be coloured or tinted in sepia, &c.?

4th. The best mode of varnishing stereoscopic prints, &c.?—I am, yours, &c. HELANDRUST,

Sunderland, May 18, 1859. An Old Subscriber.

[1. The operation you mean is what the French term *cylindering*, and is performed by passing the proof between steel cylinders, similar to a copper-plate printing press, which will itself answer the purpose, the proofs being placed between pieces of highly-glazed milled-board.

Mr. Francis, of Great Russell Street, London, sells a very efficient substitute for the purpose, consisting of a cylinder of wood, turned by a handle; a thick piece of plate glass being forced against the cylinder, by means of a screw, acts as a burnisher; the proof, either mounted or unmounted, is placed on the glass, face downwards, and drawn between it and the cylinder by turning the handle.

2. We presume, by this question, that you do not mean "*vignetting*," but printing clean backgrounds from negatives deficient in this respect. It is sometimes effected by placing a sheet of sensitive paper under the negative in the pressure frame, and exposing until the *outline* is distinct. The paper is then removed, and the *figure* neatly cut out; the remainder of the paper is then exposed to the light to blacken, and is to be gummed or glued *on to the negative*, leaving the figure bare. On printing from it, the background will, of course, be perfectly white.

3. We have a strong bias in favour of Hollingworth's paper for this purpose. Good *thick* Saxony paper also answers well.

4. Paper prints to be *varnished* must first have a good coating of *size*. They may then be *French polished*, which gives the *best* possible face — or they may be varnished with what is known as white paper-varnish, sold at the varnish makers. We believe, also, that pure white wax and turpentine is sometimes employed for this purpose.—Ed.]

MANIPULATION, &c.

To the Editor.

Sir,—1. What do you consider the best method of developing the collodio-albumen plates; that is to say a number of small ones at one time? also the nature and strength of the developer?

2. How to *make sure* that pictures (positives) fixed with hypo on glass will not fade.

3. Cannot albumenised plates, as suggested by Mr. MacNab, be used with advantage in the collodio-albumen process? at the same time, is not the iron liable to injure the bath, as I do not think it possible to wash sufficiently to remove every particle?

An answer in your next would add greatly to the obligation you have so often conferred upon, yours, &c., QUERIST.

[1. By putting them in glass dishes face downwards, resting on glass corners. Develope with saturated solution of gallic acid, to which a few drops of solution of nitrate of silver have been added. Or use pneumatic plate holders, and level a board to stand them on, and develope with pyrogallic acid one grain, distilled water one ounce, citric acid quarter of a grain. Mix with an equal bulk of honey syrup, and just before use add a drop or two of solution of nitrate of silver, pour on and off several times, and then drain for a few seconds; a sufficient quantity of developer will remain on the plate to develope the picture slowly.

2. Wash well, drain, and let the last drop *fall on the tongue*, if you have a metallic or sweet taste, wash more until no taste is perceptible.

3. The plates will do when thus prepared for any process. There is no danger of injuring the bath if common care be taken.—Ed.]

TRANSFERRING POSITIVES TO LEATHER.

To the Editor.

Sir, — I take the earliest opportunity I have had to state the method I pursue in transferring positive collodion pictures to leather or cloth.

You must first get a good picture.

The leather I find best is patent calf.

The transfer varnish is —

Alcohol	1 ounce.
Nitric acid	2 drops.
Canadian balsam	The size of a pea.

Shake and filter into a separate bottle.

(The Canadian balsam was suggested by a friend).

Cut your leather to the size required; clean it with a little of the varnish, using an old silk handkerchief. Coat the picture with the varnish (as with collodion), but drain into the mixing bottle. Lay the picture on the table, take the cleaned leather in the right hand, and put it down on the picture gently, from left to right; then lift the picture, and you will see from the glass side if there is any air bubble or superfluous varnish beneath the leather (if so, it must be pressed gently out with the fingers); then dry it at the fire, or you may allow it to dry spontaneously.

When dry, pull the leather gradually off from one corner. You have now a non-reversed positive, that may be coloured and varnished.

To transfer on cloth is, in every way, the same.

This transferring process is easy and may be quickly done, but I find it difficult to describe.

These pictures may be used in a variety of ways, which will be readily suggested to any one — such as for putting in albums, for presentation books, &c.

How greatly would young men and women, in a foreign land, value the portraits of their aged parents or friends, in the bible they were presented with on leaving their fatherland!

Hoping the foregoing may be of use to some of your subscribers, I am, yours, &c. A. R.

Glasgow, May 11, 1859.

AMENDMENTS OF Mr. MAYALL'S FORMULA FOR COLLODION.

To the Editor.

Sir, — I have slightly modified the process as regards the bath. I was trying experiments to that effect when the paper was read, but could not decide until Wednesday last.

The iodide of potassium, to saturate the bath, renders the negatives more *intense* than iodide of magnesium. I dont stop for the moment to assign a cause; but of the fact I have no doubt. I have substituted nitric for acetic acid, to acidify the bath: it is more stable, and in the hands of the amateur, not so likely to fog or get out of order; perhaps it may not be quite so sensitive, but either is more rapid than anything I have tried.

I beg to send you a pound of the collodion, with the assurance that you will try it fairly. I may add that it has been excited *twelve months.*

Should any one who has got the time to spare take it up and make a quantity for sale, I have no doubt it would be a boon to our brother photos.—I am, yours, &c. J. E. MAYALL.

P.S. — The points to be insisted on appear to me —

First — "*In keeping qualities.*"

Second — "*Can be used with a decidedly acid bath.*"

Third — The extraordinary solubility of the excitants, iodide and bromide of magnesium, *in absolute (or nearly absolute) solvents*, and their power of absorption of water without deteriorating the quality of the film, or of themselves decomposing.

May 14, 1859.

A PLEA FOR METAGELATINE.

To the Editor.

Sir,—I find the addition of chloride of ammonium to the metagelatine, in the proportion of one grain to the ounce, reduces the exposure to about one-half — a stereoscopic plate, washed in a *quart* of water, requiring twenty to thirty seconds; if a smaller quantity of water is used, or if the plate be prepared without washing off the free nitrate, of course it is much more sensitive. I believe that, if tested, metagelatine would be found more certain than either albumen or *gum*, and if only required to be kept a few days, more sensitive — while for half-tone I think it excels all other dry processes.

If developed with iron, ten to twelve seconds is sufficient.—I am, yours, &c. D. HILL.

P.S.—If greater sensitiveness is required, there is no necessity for washing at all — but the plate will only keep about two days.

May 14, 1859.

[We by no means feel certain about the advantage supposed to be gained in sensitiveness by the addition of a chloride to the preservative agents, though it has been recommended by several skilful operators, including our present correspondent. Our own experiments certainly tend to show that considerable retardation in developement is the consequence, and what is of more importance, great loss of intensity. This point, however, requires further attention.—Ed.]

THE FOTHERGILL PROCESS.

To the Editor.

Sir,—On developing some plates prepared by the Fothergill process, I find the *sides* of the picture wanting in intensity, as compared with the rest of the plate. When viewed by *reflected* light, those portions show well as positives, whilst the remainder has the appearance of a solarised picture. Can you give me an explanation of this? I use a half-plate lens — or rather the front lens of an excellent portrait combination (reversed of course) — and half-inch stop.

The lens is in the *front* portion of the mounting, as the camera will not admit of my using it at the back. *The details of these portions of the picture come out well*, but are lacking in intensity.

I am also troubled with zig-zag markings — are these consequent on careless washing after the albumen? I use a two-grain bath after sensitising, instead of the four-drachm washing.

If you can help me out of my difficulties, I shall feel greatly obliged. —I am, yours, &c. LUX.

[The weakness of the edges of your picture is due to the length of tube behind your lens, which partially shades the plate, and thus, in effect, causes the oblique pencils of light to be of less area than those in the other parts. The use of a conical tube or fitting will obviate the defect.

The zig-zag markings proceed from your plate not being sufficiently drained *before* pouring on the albumen, a slight accumulation of the free nitrate of silver solution in those parts producing a cohering coagulum difficult to remove by subsequent washing. Drain more closely, and pour on the albumen to the edge of the plate placed uppermost in draining.—Ed.]

ANSWERS TO CORRESPONDENTS.

Mark, T. — Take the third on your list: it is far the best.

Received — "Alfred Keene." "O. G. R." "S. A. Morris."

Plassey — If you will send us a private letter with your name and address, we will put you in the way of obtaining what you require.

James McConnel — We are obliged for your good wishes, and would publish your letter, but it is too complimentary.

J. K. — See report of the North London meeting in the current number.

Crystal — We prefer *good flattened* crown glass to sheet or even plate.

One in a Fix (Southampton) — Per-chloride of gold is always acid to test paper. Use the double chloride of gold and sodium, and your difficulty will vanish.

Young Hypo — We do *not* approve of pouring on the fixing solution without first washing off the developer, especially if the latter, as is usually the case, contains a free acid; decomposition of the hyposulphite of soda ensues, and stains are apt to occur.

One in Trouble — Your paper sensitising bath is do doubt exhausted or materially reduced in strength, you cannot ascertain the extent by the specific gravity alone, because of course the solution now contains nitrate of ammonia, soda, or barytes, according to the salt used in preparing your papers. Add some crystals of nitrate of silver, or evaporate the bath to half its present bulk.

A. B. C. (Wolverhampton) — You cannot have read the Journal very carefully, or you would not have stated that nothing has been said about a collodion positive process; however, proceed as follows:—

Collodion —	Pyroxyline	4 grains.
	Alcohol	2 drachms.
	Ether	4 „
Iodising Solution —	Iodide of cadmium	$1\frac{1}{2}$ grains.
	Iodide of ammonium	2 „
	Bromide of ammonium	1 „
	Alcohol	2 drachms.

Mix to make one ounce of iodized collodion.

Nitrate Bath —	Nitrate of silver	200 grains.
	Distilled water	5 ounces.
	Nitric acid	2 drops.

Coat a plate with collodion, and immerse it in the bath, leaving it there all night, to saturate the bath with the iodide of silver, &c.; it ought then to be fit for use.

Developer —	Proto-sulphate of iron	15 grains.
	Nitrate of potash	10 „
	Water	1 ounce.
	Acetic acid (glacial)	30 minims.
	Alcohol	20 „
	Nitric acid	1 „
Fixing Solution —	Cyanide of potassium	10 grains.
	Water	1 ounce.

Photo-in-a-fix — See preceding reply. Perhaps your collodion is not good.—Another developer we can recommend as follows:—

Proto-sulphate of iron	15 grains.
Water	1 ounce.
Sulphuric acid	5 minims.
Alcohol	30 „

THE PHOTOGRAPHIC JOURNAL.

No. 96, Vol. VI.—JUNE 15, 1859.

We beg the serious attention of our readers to a great and growing evil—one upon which we have before made comments and expressed our indignation. We mean the attempts now frequently made, and too often successfully, to secure patents restrictive of the *free* enjoyment by photographers generally of various advantages that have been *freely* given to the public by the original designers and discoverers.

A letter from our esteemed correspondent, Mr. Rejlander, which we publish in the current number, is the immediate cause of our again noticing at the present moment a practice that, in our opinion, merits the condemnation and energetic resistance of all who wish well to our art.

In the last number of the *Journal of the Photographic Society*, we have a copy of the specification of a patent (without date attached) granted to Oliver Sarony, for "improvements in producing photographic portraits"—said improvements consisting in taking several negatives and printing portions from each. Now, even if it were not notorious, as however it is, that this method is, and has been for some time back, practised by several well-known operators, surely after the publication of the paper by Mr. Rejlander, which appeared in the Photographic Society's Journal upwards of two years ago, and the numerous copies of his works which have been sold, it is preposterous that any one should be able to obtain letters patent for an alleged invention which actually was more fully described in the paper mentioned than in the specification of the present claimant.

We trust that the Council of the Photographic Society will be induced to consider whether any means can be adopted by the society, as a body, to prevent this surreptitious acquirement of pseudo-patent rights interfering with the progress of that science of which it is the legitimate guardian.

Amongst the re-discoveries in photography we have to notice the use of glycerine, for the purpose of retaining the collodion film in a moist condition, either before or after fixing. In a paper which appeared in the last number of the Society's Journal, this is coolly put forth as a novelty, when, in fact, there is no novelty whatever either in the use of the material or the method of application. So far as appears, no notice to this effect was taken at the meeting where the paper was read; and the editorial foot-note of our excellent fellow-labourer rather tends to convey the notion that any experiments upon the subject were not published.

This is an error which we can rectify. Not only did we personally employ the agent ourself, but Mr. H. Pollock brought the matter prominently before the Photographic Society, when a tolerably long discussion ensued upon the subject, which was no doubt duly reported at the time. Mr. Spiller and Mr. Malone, we well remember, took part in the discussion—the former having worked in this direction; and, if we mistake not, Mr. Crookes also had, like others, employed this material, and subsequently abandoned its use for that of other syrups. Mr. Hockin also at one time availed himself of it. All these facts were published years back.

The great objection to the use of glycerine with free nitrate of silver in the film is the slow but sure reduction of silver, even in darkness,—thus producing a veiled appearance.

If the paper alluded to had any value whatever, it would be in suggesting the application of glycerine to prevent the drying of the film before it might be convenient to intensify or to fix the image; but even this had already been suggested by Mr. Gulliver, with syrup from honey or sugar, quite as effectually and far more economically; and we also find the same suggestion in a pamphlet published a few days since by Messrs. Murray & Heath.

We were not a little amused, the other day, at reading in the pages of a contemporary a communication from a correspondent, in which he mentions "what appears to him *a discovery*, and *a valuable* one, albeit exceedingly simple and obvious;" the discovery being that an iron developer is applicable to the Fothergill process. We fancy it is rather late in the day to make such a discovery; for did we not publish it, with all necessary details, *some months ago?*

While on the subject of the Fothergill process we may notice the fact of a negative being obtained upon a plate thus prepared by Mr. Hannaford, with an exposure of about a second of time, and exhibited by him at the last meeting of the North London Photographic Association. The extraordinary sensitiveness was, in the opinion of the operator, due to the conversion of all free nitrate of silver into a citrate, by the addition of a suitable salt to the albumen employed.

Mr. D. W. Hill has since worked in the same direction with the phosphate of soda: for particulars we refer to our correspondence.

In America the dry processes seem to have attracted the attention of some of the most enthusiastic followers of photographic science; and a gentleman, Mr. P. C. Duchochois (whose contributions to the pages of a transatlantic contemporary we have upon one or two occasions found worth while to re-produce with due acknowledgement of their source, of course), has suggested a preservative agent, which *prima facie* seems to have some probable advantages. This substance is glycyrrhyzine (the sugar of liquorice), as originally employed in photography by our countryman and friend, Mr. F. H. Wenham, the associate of Mr. Frank Frith in his Egyptian expeditions, and subsequently by Mr. Hardwich, to obtain intensity in collodion deficient in that quality.

Its use, as now suggested by the American gentleman we have named, appears to us as well worth a trial, particularly as he gives a formula for deriving it direct from the liquorice root in a state fit for the use of photographers, and which he alleges is capable of being rendered *insoluble* by immersion of the plate coated therewith in aceto-nitrate of silver solution.

The peculiar property of glycyrrhyzine to give intensity to the impressions on the collodion film is one that we regard just now as valuable, particularly if this quality be not too intimately associated with retardation of sensitiveness. We have had very general testimony of the exalted sensibility attained in most of the dry processes where a small portion of a soluble chloride or other analogous salt is mixed with the preservative agent; and, without pronouncing a decided opinion upon the point, we are

clear upon another in connection therewith, viz., that the addition of agents indicated above certainly decreases the intensity of the image produced: it is therefore not at all improbable, that the union of the two may result in each remedying the defects of the other; at any rate the experiment is worth a trial.

We have before now remarked upon the advantage of association in carrying out improvements upon any pursuit, and this fact is again prominently brought before us in the establishment of the American Photographical Society, which is already bearing useful fruit. To those who have been acquainted with American photographic literature for any little time, this fact is incontestible; in corroboration of which assertion we point to several short papers, none the less valuable that they are short, read at the last (the fourth) meeting of that body.

OUR ORTHOGRAPHIC CAMERA.

By The Editor.

Now that the "orthoscopic" principle of construction, as applied to landscape lenses for photographic purposes, appears to have taken a very strong hold upon the fancy of the public, a greatly increased demand for cameras with "swinging" backs has also concurrently arisen. There are, however, two or three very serious drawbacks to the general adoption of cameras possessing the peculiarity mentioned; the considerably increased expense of construction not being the least of them. The enhanced cost is owing partly to the fact that much additional labour is requisite in the manufacture, and partly because extra skill in the artisan being involved there are fewer hands available in producing them than is the case for ordinary instruments.

Another objection consists in the materially greater weight and bulk necessary for swinging-back cameras as now usually made.

The practical advantage to the operator in producing excellence of result by the adoption of the contrivance under consideration is, however, so incontestably manifest, that the writer has been induced to make an attempt (which he believes to have been a successful one) to reconcile the conflicting elements of discord, and acquire all the advantages without the objectionable bulk, and at a comparatively trifling cost.

The simplest mode of explaining the method of accomplishing the desideratum will probably be to state clearly first the conditions imposed, and then show how they may be fulfilled.

Where the objects to be delineated are arranged in various planes, at different distances, and distributed over the greater part of the area of the field of view, there is of course no remedy but a reduction of the aperture of the lens; but where they are arranged in such a manner that they are capable of being regarded as situated *approximately* in one plane, *inclined* to that of the sensitive plate, then a larger effective aperture of the lens may be employed, provided that the plate be inclined in an *opposite* direction, so that the part receiving the image of the object most distant from the operator is inclined *towards* the front of the camera, and that on which the image of the near object is depicted consequently further removed from it. For instance a row of trees or the side of a street placed diagonally towards the axis of the camera will illustrate the point under discussion.

It is essential that the axis of the lens shall be directed towards the centre of the plane of delineation (in our case the sensitive plate), but it is quite immaterial what form is assumed by the *front part of the camera*, provided always that it does not in any way interfere with the rays of light proceeding from the lens.

The following diagrams will probably tend to elucidate the propositions laid down.

FIG. 1

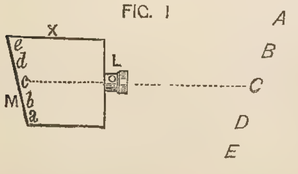
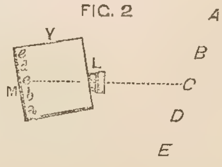


FIG. 2



Let A,B,C,D,E, *Fig.* 1, represent a series of objects placed diagonally towards the axis of the camera, X, which is furnished with a "swinging" back, M; by inclining it as in the diagram, the images of these objects are represented pretty correctly in focus at *a,b,c,d,e,* the rays from the central object, C, proceeding axially through the lens, L. But if the camera be not furnished with a "swinging" back, it would still be possible to fulfil the conditions required if the camera were turned on its axis as at Y, *fig.* 2, provided that it were also possible to move the lens, L, out of the centre of the front of the camera, and also to give it an inclination from the perpendicular as shown in the figure.

The relative positions of the sensitive plates, M, in both cameras, X and Y, being identical with regard to the lenses and the objects, and that without being interfered with by the front portions of the respective cameras.

Most cameras for landscape purposes are furnished with *sliding fronts* in one direction at least; many have them in both directions, especially when the cameras are not square but oblong. Those already having these adjusting fronts require but a trifling addition to acquire all the requisite movements, but where the slidings fronts are wanting it will be necessary to supply them, in addition to which a piece of mahogany or other wood must be turned of a globular form; segments are then to be cut from opposite sides, leaving a central section of the globe about two inches thick, through which a cylindrical or conical hole is to be made, as shown in *figs.* 3 and 4, the former where the lens is desired to slide for

FIG. 3

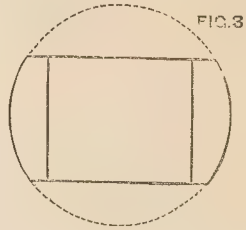
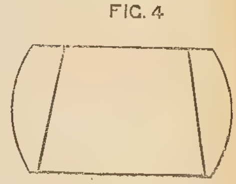


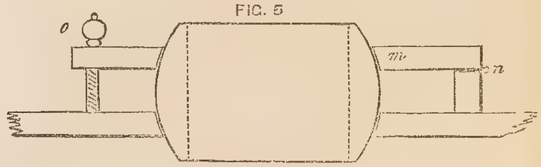
FIG. 4



adjusting the focus, the latter where this is not required, but the flange of the lens can be screwed on to the flat surface of the segment of the globular piece of wood.

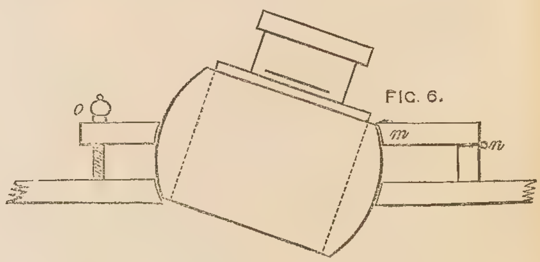
This portion of a globe is made to work in a hole in the camera front *slightly smaller* than the diameter of the globe, the edges of the aperture being armed with black velvet, partly to ensure a smoothness of movement, and partly to prevent even the smallest leakage of light. The globe is kept in place by means of another

FIG. 5



thin piece of wood, as shown at *m*, *figs.* 5 and 6, having a similar

FIG. 6.



aperture to that last named, and which is hinged at *n*, and capable of *slight* compression by a screw at *o*. The whole then acts upon the ball and socket principle; the compression by the screw serving to keep the lens steady in any position to which it has been previously adjusted. When the lens in use is but small, a spring of some kind may be substituted for the screw, and thus no time lost in the adjustment.

It will be seen that by the contrivance above indicated every thing at present attainable by the camera having a "swinging" back in *both directions* is accomplished, while the additional bulk and weight to the ordinary cameras are trifling, and the cost but shillings where the "swinging" backs cost pounds.

DRY PROCESSES AND THEIR DIFFICULTIES.

By the Rev. WILLIAM LAW.

[Read at the Meeting of the Birmingham Photographic Society, 31st May, 1859.]

GENTLEMEN,—When you were pleased to confer upon me the honorary membership of your Society, I felt that the acceptance of your kind compliment involved the proffer of my services in contributing, so far as the results of my experiments might enable me, to your common fund of information. Societies of a scientific character must seek advancement, not in the *prestige* of high connections or in the mere *patronage* of honorary members, but in the free interchange of ideas, in the intelligent and patient grappling with hard facts, and in carefully-performed experiments leading to deductions by which science may be elucidated and art improved. Distance precludes the possibility of my frequent presence at your discussions, but, whenever I have joined them, the effect has been to strengthen my opinion that the Birmingham Photographic Society embodies within it the elements of success, and the report of its proceedings will be found, I apprehend, to keep the public *au courant* with the progress of the art of photography. I will only add on this head that my connection with your Society has been to me an advantage as well as a compliment, for I have never attended its meetings without having been brought into contact with skilled chemical investigators as well as enthusiastic and thinking operators, whose acquaintance I am glad to have made.

My paper, last year, was intended to explain and remove some of the difficulties which accompany initiation into the mysteries of the camera. Of these, my limits forbade my taking little more than a "bird's-eye" view; I could only select a few of the more prominent and common. A large portion of the field then entered remains as yet unexplored. Care and skill, patient investigation, reading, and unceasing inquiry respecting the merits of new processes and the failures of old, can never be dispensed with by the amateur who wishes not only to obtain satisfactory results, but to know the *rationale* of his success, and to keep pace with the progress of this complete branch of science. And when we consider the play of nicely-adjusted chemical affinities which are brought to bear in the production of a finished picture, and take into account the fact that the collodion and sensitising bath are actually undergoing chemical decomposition with each individual plate we prepare, we do not feel surprised that a large proportion of the communications which fill the pages of our photographic publications should involve seeming contradictions, and solicit explanations of facts unaccounted for and of difficulties unremoved. And here I am brought at once to a point of the greatest possible importance in all processes, either moist or dry, and that is the *capacity of the sensitising bath.* It is the worst possible economy to be sparing of nitrate of silver, for it must be borne in mind that the sensitising of a plate necessarily involves the abstraction of as much nitrate as is required to form the sensitive film. The silver bath is, if small, very rapidly and seriously weakened. Small upright glass baths for stereo-sized plates may be, if duly used, even like "Godfrey's Cordial" to mother's, "a real blessing" or a bane. Suppose for instance, an amateur employs a glass bath of the capacity of eight ounces, requiring half an ounce of nitrate of silver for bringing it to the normal strength; he prepares a dozen plates wherewith to test the value of some dry process; the result is satisfactory, and he sends forthwith to his favourite journal a grateful laudation of the discovery thus triumphantly tested. Now "comes the tug of war" which leaves our champion crest-fallen and forlorn. He has perhaps a friend, who is an advocate not altogether unprejudiced of some more ancient process which has yielded him the like satisfaction, and of which he considers the other a mere upstart rival. Our first acquaintance we will suppose a Fothergillian, his friend a Norrissian or a Taupenotian. The plates are duly prepared, the collodion and bath are only it may be a fortnight old, every step is taken *en regle*, our friend gains confidence, and, with that perfect satisfaction "which makes a heavy burden light," away go the companions to some lovely nook, of which the selection had long ago been carefully made. In due course we see them again in the dark room, watching with eager eyes, though varying in expectation, the developement of the first plate. There is a suspicion, ill-concealed by our sanguine Fothergillian, of *under exposure*, but the total absence of *density* is anomalous with this supposition; the plate is washed, and receives a fresh dose of developer, but, alas! the result is only a patchy mass of irregularly reduced silver, showing beneath a dirty veil, the bare tracing of a beautiful shadow. Alas! *Ex uno disce omnes*, every attempt results in similar disappointment; the whole batch of plates exhibit a lamentable failure. The Fothergillian is confused; the exultation of his Norrissian acquaintance is tempered by the claims and sympathies of friendship; but, when the last plate is on the point of being given up, he cannot restrain a gentle nudge of the elbow, with "how now old fellow!" as its expressive vernacular accompaniment. Now the only exaggeration that our description contains is, that the first batch of plates were all *equally* good, and the other all *equally* bad. *There was a difference*, to a keen and *experienced* eye, quite perceptible, between the first and last of both lots, and this was mainly due to the *varying strength* of the nitrate bath. My advice is that no amateur should ever think of making a smaller quantity of nitrate solution than forty ounces. In a bath of stereo-size, the deterioration from the cause assigned, although not so rapid as our supposition would imply, must never be overlooked by those who would wish to maintain a normal condition of sensitised surface. After preparing half a dozen plates, it will be well to have fresh recourse to the forty-ounce stock bottle. For stereo purposes I always on this account employ a glass bath adapted for plates 10 in. × 8 in. The advantage is apparent by the simple application of arithmetic, which will prove that the same abstraction of silver that would reduce the strength of an eight-ounce bath to fifteen grains to the ounce, would still leave a forty-ounce bath with twenty-seven grains to the ounce. To those who would prefer the hydrometric test, and trust to specific gravity indications for keeping up the strength of the bath by the occasional addition of fresh crystals of nitrate, I would strongly recommend a little graduated and loaded tube, by Negretti and Zambra, of which I have very satisfactorily tested the accuracy and value.

It will be unnecessary for me here even to allude to the importance of clean plates, or to repeat my directions for insuring their perfect cleanliness; but I must not omit to notice one cause of stains which is not so generally recognised as it ought to be, but which nevertheless is by no means unfrequent, and that is, *contact with the fingers in removing the plates from the sensitising bath.* If the plates, after being raised, are left some time in an upright position to drain, the stain will seldom extend sufficiently beyond the margin of the film to damage the picture; but it is always advisable to have at hand some finger guard, which can be easily made of thin sheet gutta percha, which are very efficient and inexpensive.

To those who employ Taupenot's process, and experience the annoyance of blistering of the film or developing, I would recommend, not only the perfect cleansing of the plates, but the application of a substratum of albumen one ounce, and distilled water two ounces, well frothed and filtered through sponge in the usual manner. This insures the adherence of the film to the plate, prevents blisters, and admits of the employment of collodion which might otherwise be unsuitable. The utility of such a substratum has been recognised and *re-discovered* several times by exponents of dry processes within the last two years; but if priority of publication be regarded as supporting the claim of original discovery, reference to my communication in Vol. II. of the *Journal of the Photographic Society*, pages 46 and 47, September, 1854, will very satisfactorily dispose of this matter. Since the date of my letter alluded to, I have been in the constant habit of employing substrata, either of albumen or isinglass (as therein described and recommended), and with invariably satisfactory results.

Further experiments with the plates of the Birmingham "Dry Collodion Plate Company" have confirmed my opinion of their certainty and sensibility, and their general perfect adaptation to the wants of the travelling photographer; and to those who lack either time or skill to prepare their own dry plates I strongly offer the recommendation to procure a supply of these, as far less liable to cause failure and disappointment than any others at present in the market. Of all bought dry collodion plates, these are by far the most sensitive. My own practice for the last few months has been entirely confined to a modification of Taupenot's process and to Fothergill's—the former the *slowest*, and the latter, in my hands, the most rapid of all the dry processes which I have tried. Both these have yielded me most excellent results, which I shall be happy, when I am able to attend your meeting, to exhibit to the members of your Society.

The former process is conducted as follows:—The plate is cleaned, and the collodion poured on in the usual way; when the film is well set, the plate is plunged into a bath of distilled water, in which it is left until, on being raised, all streakiness has disappeared. After closely draining, iodised albumen is poured gently on its surface, and allowed to remain two minutes. The plate is then drained and dried, and is ready for sensitising in the following bath:—

Nitrate of silver .... 60 grains.
Distilled water .... 1 ounce.
Glacial acetic acid .... 30 minims

Saturate with iodide of potassium in the usual way and filter. Leave the plate in this bath for two minutes; then wash off all the free nitrate in *hard* water, which must be finally displaced from the surface by pouring thereon a drachm or two of distilled water. Then drain and dry. Develope by immersion in a saturated solution of gallic acid, and two drops to the ounce of a solution of

Nitrate of silver .... 20 grains.
Water .... 1 ounce.
Glacial acetic acid .... 10 minims.

The exposure is, in good light, for general landscape work, two minutes and a-half to three minutes, with one of Ross's four inches and a half focus stereo lenses.

This modification has proved to me far more satisfactory than the original Taupenot process, which it excels in its adaptation to the effects of the aërial perspective, which are charmingly rendered in some of my best pictures. The developement sometimes requires upwards of an hour, but care must be taken not to spoil the picture by *needless accumulation* of the black deposit, which would ruin the vigour and the gradation of tone which distinguish a good picture from what have been not unaptly termed "smears of soot and whitewash." For quick work my favourite process is Fothergill's, in which I follow the directions usually given, and seldom use more than half an ounce of distilled water for equalising the free nitrate left on the plate after its withdrawal from the bath. Plates thus prepared will keep a full month in summer without showing signs of discolouration, and yield impressions of great delicacy and vigour. I find a neutral bath is generally recommended for this process, and no doubt the sensitiveness of the plates is thereby considerably exalted; but neutral baths are very liable to get out of order, and soon begin to show an alkaline reaction upon test paper, so that I always make a point of adding sufficient acetic acid to a new bath, prepared with *fused nitrate* (which I always employ) to show a reaction of the opposite character. The only difficulty with the Fothergill process, and that of comparative unfrequent occurrence, is to check the occasional tendency of the developer to find its way under the film. This is entirely obviated by the employment of the albuminous substratum already alluded to, and from the constant use of which I have never yet found my nitrate bath manifest the slightest indication of discolouration.

Compared with the ordinary Taupenot process the Fothergill excels in sensitiveness in the proportion of three to two. For printing transparent positives on glass I prefer the Fothergill plates to all others. The tone is that of a rich brown black, admitting of the most perfect gradation and harmony of light and shade. I have applied these transparencies to the magic lantern, to which they are exceedingly well adapted, and there is no danger of that objectionable greenish tint inseparable from the employment of the Taupenot plates for this purpose.

And now, gentlemen, I must conclude my very hastily-written paper with an apology for the meagreness of this attempt to throw my mite into the treasury of your greater abundance; begging you to deal gently with all the deficiencies you may be able to detect, and to attribute more to lack of present leisure and opportunity than of kindliness of feeling and sincerity of intention that I am unable to interest you more or serve you better. With the final expression of my sincere regret that the state of my health necessitates my requesting your secretary to read this paper instead of being present with the apparatus and the results, which it was my intention to have submitted to your examination, I will couple the assurance that I shall be happy (D. V.) during your next session to take an early opportunity of bringing before you the apparatus and manipulations which were to have illustrated and explained this paper.

THERMOGRAPHY v. PHOTOGRAPHY.

Calorific reductions as a means of Producing Images upon Sensitive Paper.

By M. Niepce de St. Victor.

The following experiments are an extension of those of Moser, Knorr, and Draper: to the facts already established, I believe I have added a great number of others both new and interesting, of a nature calculated to throw some light upon this important class of phenomena.

If, upon a metal plate heated in contact with boiling water, we place first an engraving on a printed paper, then a sheet of paper impregnated first with nitrate of silver and afterwards with chloride of gold, we obtain a violet blue image of the blacks of the engraving or of the printed letters. If the paper is only impregnated with nitrate of silver, the whites only of the engraving are reproduced in a bistre colour.

A metal tube heated to the temperature of 212° F, the opening of which covers the engraving placed upon the sensitised paper, produces the same effect as the warm plate.

With paper prepared with the salts of silver and gold, and with the plate warmed with boiling water, large printed characters are reproduced at a distance of several *millimêtrès;* but the image is not produced if we interpose a thin plate of mica, metal, or even a piece of *papier végétal.*

If we place a paper printed with large letters between two glass plates, and warm the whole to a temperature sufficient to slightly scorch the paper, upon removing the paper we perceive the letters have left their imprint upon the glass. If upon this imprint we place a sheet of paper prepared with the salts of silver and gold, and warm the whole upon a metal plate, heated with boiling water, we obtain a new image, as if the sensitive paper had been placed upon the printed characters themselves.

Designs traced with writing ink, black lead, or charcoal, are not reproduced when they are traced upon ordinary paper, but they are produced upon *papier végétal.*

An unvarnished positive photographic image upon collodioned glass, formed by reduced iodide of silver, has printed upon sensitised paper, under the influence of heat, many consecutive images of the "darks;" the last proofs being the sharpest and most vigorous.

Some tiles and porcelain plates (glazed) with black letters or painted in various colours, and passed through the furnace without being enamelled, gave impressions; but letters and designs covered with enamel, gave none.

Tissues shaded with black and white, or with varied colours, impressed their images upon sensitised paper; but the images were very variable. In general the blacks printed the best, but frequently the whites also; the image of every colour has a character and intensity peculiar to itself, the variations observed depending doubtless upon the nature of the colour. The colours produced by the same colouring matter applied with different mordants in succession, were printed very unequally and very differently; Madder, for example, which gives upon cotton a red with alumina; violet, with a salt of iron, a deep brown or a red brown, according to the relative proportions of alum and iron; the red was printed stronger than the other hues upon paper prepared with chloride of gold. In the case of whites obtained upon coloured grounds by means of a *discharge*, the whites as well as the grounds left their images upon the sensitive paper; upon cotton dyed with indigo blue, the blue ground is reproduced, but the whites are not; while in those dyed with Prussian blue, it is on the contrary the whites that are reproduced. If we spread upon paper or porcelain separate bands of indigo and Prussian blue, only the bands of indigo will be reproduced, never the Prussian blue. Another fact also proves the preponderating influence of the peculiar nature of each colour and ink. I have seen two engravings of the same drawing, but printed with different inks, one gave a positive, the other a negative image upon paper sensitised with chloride of gold.

I shall conclude with some remarks upon the preparation and use of sensitive papers in thermography.

Prepare two solutions, one of fused nitrate of silver, of the strength of one per cent., the other of chloride of gold of the same strength. The paper sensitised with nitrate of silver only is obtained in the ordinary way. To prepare the paper with both salts of silver and of gold, float upon the solution of nitrate of silver a piece of Berzelius's paper, holding it by one corner, dry it slowly without scorching before a fire, and when dry pass it through the solution of chloride of gold, floating the same side that was placed on the silver solution, dry it again without the temperature attaining that of boiling water, because at this temperature the paper becomes discoloured.

To obtain an image, place an engraving with its back upon the plate warmed by boiling water, and lay the sensitised paper upon the engraved side, and cover it with a plate of glass of several *millimêtrès* in thickness; upon looking through this glass we see the image appear in a few minutes. The image is clearest when the paper is very dry and not over sensitive; if it does not become sufficiently distinct, it may be strengthened by exposing the sheet of paper to the heat of a clear fire. If it be very vigorous, and stands out clearly from a ground slightly coloured, it may be fixed by treating it with a solution of hyposulphite of soda, which removes those portions of the salts of silver and gold which have not been reduced by heat. The paper sensitised with the double salt of

silver and gold will not keep in the dark, it must be prepared as wanted and used immediately. Paper impregnated with a solution of nitric acid of a strength of one per cent., or with a solution of potassium of ten per cent., is sufficiently sensitive to yield thermographic images, but only at a temperature much above 212° F.

I attempted to obtain images in the focus of a lens which concentrated the rays emanating from a heated object, but the result was always negative. I have not yet ascertained if the images formed in the focus of a concave mirror are more active. At present it appears to be an indispensable condition of success, under certain circumstances, that the radiation be direct without the interposition of a screen.

The action that produces the thermographic image is, doubtless, a very complex one; calorific radiations play an important part; but the solid vapours emanating from the heated object may also intervene.

But in the case, at least, of the medals and a dry stamp which were reproduced, notwithstanding the interpositon of a thin continuous plate of mica, silver or copper, provided the pressure was sufficiently strong, and the temperature high enough, it must be understood, that the action of heat preponderates; and it appears to me established, that a high temperature produces, under certain circumstances, facts analogous to those we see produced daily by light, such as the fading of colours, the reduction of the salts of gold, silver, &c.

Luminous and calorific action may sometimes coalesce or unite to produce simultaneously the same effect, but they are often separate and distinct, as proved by the experiments of MM. Bouillon and Sauvage.

These experiments were made previous to the month of January last, in the presence of witnesses.

IMPROVEMENT IN PHOTOGRAPHIC ENGRAVING.

By M. Berchtold.

Heliography, invented by Nicéphore Nièpce some thirty years ago, has been the starting point of all the beautiful discoveries which during the last fifteen years have brought photography to an unhoped-for degree of perfection. Nièpce had from the first attempted the engraving of photographic images, and in 1829 had partially succeeded, but it has remained unperfected to the present day.

The results at which Nièpce arrived, were, in a photographic point of view so admirable, and the method by which he reproduced a drawing, engraving, or view, taken in the camera, already so perfect, that it seems surprising it has remained so long neglected.

The proofs obtained by M. Nièpce's process are very beautiful; especially if, instead of engravings or drawings, we employ photographic positives or negatives. Still there is a great difference between these proofs and the photographic image obtained direct. It is therefore important to note this difference in order to appreciate the theory of heliographic engraving.

The photographic proof is formed by the colouration of a substance under the influence of light, the varying intensity of which gives more or less strength to the tones of the image, and consequently gives the image and effect of the object.

In the heliographic images obtained by means of bitumen this is not the case. The design is not formed by the colouration of the substance, but the luminous rays modify the varnish, so that it becomes more or less insoluble according to the intensity or duration of this action. By means of a subsequent washing with a suitable solvent, the portions of the varnish which the light has not attacked are completely dissolved, while upon those parts which have been impressed by the light, the solvent acts proportionably to the degree of that action.

The gradation of tint, which is also very perfect in these images, is therefore due to a greater or lesser quantity or thickness of the varnish, and not to its colouration, which remains the same after exposure to the light.

In the numerous attempts at engraving which have been made since Nièpce to the present day, the metal laid bare in the darkened portions of the design has been acted upon and bitten-in by an acid, or by means of the galvanic pile; and to impart to the plate the *grain* necessary to make it retain the ink, recourse has been had to a process employed by engravers, which consists in dusting the plate over with powdered resin, which adheres to the plate when it is warmed, and protects it from the action of the acid.

Reviewing this process, and considering the manner in which the half-tints of the heliographic image are formed, it is easy to understand that the powdered resin which spreads itself equally over the whole surface of the plate must have a peculiar effect upon these half tints, which are already covered with a certain thickness of varnish, rendering the results very unsatisfactory.

Reflecting upon this objection, I have endeavoured to produce a *grain* by the direct agency of photography, and after various attempts I have succeeded in producing it upon the positive proof, by means of the *roulette* employed by engravers.

This method, which yields an excellent, fine, and regular grain, produces admirable results. It also presents many important advantages: first, it simplifies the heliographic operations, as exposure to light gives the complete image at once, such as the acid produces subsequently by biting into the metal; then it permits of the employment of caoutchouc to consolidate the varnish, which when the plate is warmed to form the *grain* by resin, cannot be adopted, as the caoutchouc is disorganised at the temperature required.

A plate of glass is thinly coated with an opaque varnish. By means of an engraver's ruling machine a series of fine lines is traced in one direction over the whole surface of the plate. When the metal-plate coated with its bitumen varnish has been exposed to light under the negative, before it is washed, the ruled glass-plate is substituted for the negative, and the light allowed to act. Wherever the bitumen has been acted upon, while it was under the negative, no new action is affected by the light passing through the ruled plate, because the bitumen has become insoluble, but only on those parts which have been partially or not at all influenced by light. After sufficient exposure to light the ruled glass is lifted and turned in an opposite direction—that is, placed at right angles to the first lines, and again exposed to light, but for a shorter time than before. The ruled glass is next placed diagonally to the squares obtained, and repeated in the opposite direction, the time of exposure decreasing with each change of position. In this manner a multitude of fine points are obtained over the plate, but only in those parts where they are required. The whites retain their purity throughout, while the grain, on the half tints, instead of being equal is modified.

NOTICE OF A DIACATOPTRIC TELESCOPE.

By M. Babinet.

The substitution of mirrors of silvered glass for metallic mirrors, opens a new field to optics and astronomy. M. Foucault, by a process he has invented, can at pleasure modify the spherical surfaces of glass mirrors, hence results an unexpected perfection in images and apertures till now deemed impossible. Photographic apparatus, as well as the telescope and microscope, are assured of important improvements.

The construction which forms the object of this note is one of those which had no chance of success before M. Foucault had found the means of modifying at will the curvature of his reflectors. It consists of receiving upon a concave mirror the rays previously rendered convergent by an ordinary large achromatic *objective.* We can thus easily reduce the lunette to one-fourth of its focal length. It becomes a sort of Newtonian telescope.

The mirror with hyperbolic surface is placed at one-fourth of the focal distance of the achromatic objective, with an opening equal to three-fourths that of the objective. If the surface of mirrors remained spherical, it is evident that the accumulated aberrations would render this combination inadmissible. I shall therefore only consider it as a question to exercise students upon.

Since I have seen the conclusive results obtained by M. Foucault in the realisation of surfaces demanded by the special requirements of every instrument, I have revived the old idea of the diacatoptric combination now under consideration, and I am assured that there is no obstacle to the success of this shortened telescope. I may add, that the preservation of the polish of the mirror, and the absence of currents of air which disturb the eye in open Newtonian tubes, are points greatly in favour of this new arrangement.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The last meeting, previous to the recess of this Society, was held as usual, on Tuesday, the 7th instant, at the Society's Rooms, New Coventry Street—P. Le Neve Foster, Esq., V.P., in the Chair.

The Chairman stated that in consequence of very recent and severe domestic affliction the Secretary was unable to attend the

meeting, and the minute book of the Society, which was locked up and the key in the Secretary's possession, could not be got at, it would therefore be necessary to dispense with the usual reading and confirmation of the minutes of the previous meeting until the next gathering.

The same cause, the Chairman stated, had prevented the preparation of the usual paper, so it depended upon the members present to bring forward matter for discussion to fill up the blank. Mr. Malone had brought a camera for exhibition and he would probably make some remarks upon it.

The CHAIRMAN also handed round for examination a number of proofs, produced by Mr. Horsley, by what he termed a pigment process, and almost identical with that discussed at a previous meeting, and brought before it by Mr. Pouncy. In the present case various pigments were substituted for carbon.

The proofs were narrowly examined by most present, but did not elicit any public remark. The same faults noticed formerly in Mr. Pouncy's productions were apparent in Mr. Horsley's, viz., want of half-tone, imperfect aërial effect, and white parts not quite free from granulation. They were certainly inferior to the best of those exhibited by Mr. Pouncy; but the capabilities of the process, or rather variation of the last-named operator's method of operating, were apparently equal, if not superior, if performed by an equally skilful manipulator.

Mr. MALONE exhibited and described at great length a camera, recently constructed for him by Mr. Ottewill under the direction of the former. It was made of Moulmein teak, with a rigid tail board having a long screw adjustment. The body of the camera being separable from the tail-board, was formed upon the folding bellows principle. The front was made sliding, only in a perpendicular direction, and the back *swinging* in only one direction, that is upon a horizontal axis. The dimensions were such as to admit as a maximum of a square plate of glass 13½ inches siding being employed, smaller sizes being of course available by the use of appropriate inner plate frames. In order to increase the rigidity when in use, a brass rod was made capable of attachment by screws to the upper part of the frame work, and the amount of adjustment for focal length was from three or four to about thirty inches, thus adapting it to serve with various lenses, either single or compound. The cost was stated, in reply to a question to that effect, to be about £12.

Mr. MALONE was under the impression that the kind of wood of which it was constructed was one very little known, and that several points to which he drew attention were novelties, especially the method of mounting the focussing screen. He considered it a great advantage to have a rigid instead of a folding tail-board, and one that could be easily detached from the body of the camera, thus the body could be carried in one hand and the tail-board in the other. He thought it requisite for a photographer to be "armed at all points," and considered that, as regards a camera, with one like that before the meeting he would be so armed. He asked to have it found fault with, that he might ascertain if it were possible to improve it.

The camera evidently did not meet with the approbation the owner anticipated, while some jocularly remarked that instead of being "armed at all points" with such a camera, one might rather be considered as "loaded at all points."

A MEMBER, with whose name we are unacquainted, stated that he had recently purchased a camera of M. Jamin, of Paris, about the same size as Mr. Malone's, very similar in construction, and having all the advantages claimed for the latter, at a cost of six pounds.

Mr. HEATH protested against the time of the meeting being occupied with a long description of that which embraced no novelty whatever, and with which those present, being photographers, must be all perfectly familiar. He disputed the principles laid down by Mr. Malone as desirable in the construction of cameras, and accused him of inconsistency in advocating sliding fronts and swinging backs, and yet leaving half of these advantages unacted on, by adopting these movements in only one direction. If good at all, they were clearly desirable in both directions.

Mr. MALONE asserted that by the course he had adopted he had shown his discretion as well as his judgment. One might have too much of a good thing; it was not advisable to encumber one's self too much, and he thought he had hit the happy medium.

Mr. SEBASTIAN DAVIES made some observations relative to the futility of Mr. Malone's supposed remedy for preventing the entrance of light at the upper part of the dark slide.

Mr. SHADBOLT would find no fault with Mr. Malone's camera, for the simple reason that he differed in opinion with that gentleman upon nearly every point of construction advocated by him; consequently it was impossible for them to regard it from any thing like the same point of view. There were, however, two points upon which he would trouble the meeting. His occupation naturally entailed the most intimate familiarity with the qualities of different kinds of wood, but especially those of mahogany, and also of teak, that of which Mr. Malone's camera was made; which was not, as the latter supposed, little known, but consumed in very large quantities, chiefly for shipbuilding purposes, and also for the construction of railway carriages. The kind of teak wood in question was not the African wood, but the production of the East Indies, and being shipped at Moulmein was technically known as Moulmein teak. Its specific gravity is about equal to that of the average of mahogany from the Bay of Honduras, so that there is little or no advantage in point of result. It is rather more brittle than mahogany; but as the grain is generally almost universally extremely straight, its "standing" qualities are good, and the character of the wood very uniform. With mahogany the grain is often much twisted, giving rise to the beautiful appearance known as "figure;" but some mahogany from Honduras had a grain even superior to that of teak in straightness and "standing" qualities; of that kind all coach panels are made, and it would be seen at once that, as they are subjected to great variations of temperature as well as moisture and dryness, the test was one greater than cameras are liable to. He therefore preferred this kind of mahogany to any other wood whatever for cameras, though he thought that next to it teak was preferable, and even better than "figury" mahogany, which he often noticed was selected by those who thought more of appearance than utility.

The second point on which he would remark was relative to a "swinging back," upon the advantages of which opinions were divided. He thought them highly useful; but without a movement in both directions more than half the value would be sacrificed. If he had but one movement, it would be just the opposite one to that adopted by Mr. Malone. He had contrived a very economical but efficient substitute for a swinging back, adaptable at a trifling cost to cameras already in existence, and proceeded to describe it by aid of a diagram; but as full particulars will be given in a separate article, it is needless to repeat the description here.

Mr. ENNEL advocated the use of doors opening by an external lever for the dark frames, instead of sliding shutters as generally employed. He also described an arrangement he adopted for his focussing screen, which he never removed from his camera; but it being kept in place by means of elastic bands of india rubber, which always brought it up to its bearings, he was able to slide in his dark frames between the focussing screen and its bearings, the elastic bands giving way sufficiently for the purpose.*

Mr. MALONE, in reply, illustrated the old saying that—

"A man convinced against his will,
Is of the same opinion still."

Mr. SHADBOLT wished before parting to request the attention of the Council, to consider whether it might not be possible for it, as a body, to exercise some kind of supervision relative to the unjust acquisition of patent rights, inflicting serious injury on photographers. It might be possible to prevent parties obtaining patents for matters to which they had no right, by constantly watching the applications for patents, and giving due notice of the same, by which the attention of those interested might be attracted to the point.

Mr. HUGHES also urged upon the Council the advisability of giving members due notice of the probable subjects to be discussed at the meetings.

The adjournment until next November was then announced.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE last meeting for the session of this Society was held on the evening of Wednesday, the 1st instant, at the Rooms of the Literary and Philosophical Society, Mr. MABLEY in the chair.

George Shadbolt, Esq., was elected an Honorary Member of the Society.

Some photographic portraits, life size, enlarged from small negatives, by Mr. D. A. Woodward, of Baltimore, United States—he having patented a camera for the purpose—were exhibited to the meeting, and much admired for artistic effect.

Mr. WARDLEY exhibited a small orthoscopic lens by Ross, for covering ten inches by eight inches, the peculiarities of which he explained to the meeting, and exhibited some prints produced by it, showing the capabilities of Mr. Ross's lenses. He (Mr. Wardley) thought them better than Voigtlander's and quicker.

* This appears a very ingenious and advantageous arrangement.—ED.

A general discussion on the merits of the various lenses, by different makers, took place, and most of the members thought no lens for landscapes had yet excelled Lerebour's, and for architectural subjects Voigtlander's. Mr. Wardley exhibited a developing stand with a circular top, which was considered more convenient than the triangular ones.

The CHAIRMAN called the attention of the meeting to a sort of deposit which some of the members had experienced upon collodio-albumen plates during the developement, when a general discussion took place on the subject.

Various general subjects were discussed, and after a vote of thanks to the Chairman, the proceedings closed. Being the last meeting of the session, and the summer so far advanced, the attendance was small.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Society was held in the Chorlton Town Hall, on the evening of the 8th instant, Mr. Nicholson, Vice-President, in the chair. The minutes of the last meeting having been read and confirmed,

The CHAIRMAN said that, as the last meeting afforded very little time for the discussion of Mr. Draffin's paper on the Dry Processes, it had been considered desirable that another opportunity should be offered to members to express their opinions and experience on the subjects under review. Opinions ran strongly amongst them in favour of both Taupenot's and Fothergill's processes; and as the Society contained skilful operators in both, he hoped that the discussion would elicit information that would be serviceable to all who were interested in out-door work. He thought every one's experience would testify to the excellence of the pictures obtained by careful manipulators in both processes, and this opinion was well illustrated by the specimens Mr. Draffin had sent. Selecting the best examples of each, viz.—*The South Aisle of York Minster* (Taupenot), *St. Mary's Abbey* (Fothergill), and *The Hospitium, York* (Hill Norris), he thought the relative merits of the several processes were pretty equally balanced. Assuming, therefore, that the *results* were equal, their choice would be limited by those considerations which came next in importance, and these would be their *preservative* and *sensitive* properties, and the *ease* and *certainty* of manipulation. On these points he would invite discussion. Their Secretary, the cause of whose absence he much regretted, had sent him a letter, which he would at once read.

Trefrew, June 4, 1859.

DEAR SIR,—I regret very much being unable to attend the next meeting of our Society; but you know how much I have been a sufferer for some months past, and how imperative it had become that I should seek rest and fresh air. I hope, however, that my present leisure may be productive of some interest to our future meetings.

Though I write this to you, I should be glad if you will read it to the Society, as I purpose making a few remarks upon Mr. Draffin's paper, which was read at our last meeting, and the discussion upon which was adjourned.

Mr. Draffin admits that for *some* kinds of work the three processes, Taupenot's, Fothergill's, and Hill Norris's, are equally good, but that for in-door or dark subjects Taupenot has a decided advantage over Fothergill, inasmuch as it suffers less from over-exposure, and yet is quicker in the camera! I submit that the process which answers as well as another under one circumstance will be quite equal under any other, if both receive equal justice in their preparation. Can Mr. D. say this was the case in his *Interior of York Minster*, where the Taupenot picture was exposed three-quarters of an hour and the Fothergill four hours? Few who have had any experience in the two processes will believe that the insensitiveness of the Fothergill plate was attributable to the process. Mr. D. seeks to illustrate his argument by showing us a picture he obtained, by the Taupenot process, of an old black chest, in a dark room in York Minster, adding that "Fothergill was a failure—completely so." If Mr. D. wished to have proved his case from this experiment he should have submitted the Fothergill picture as well as the Taupenot. How do we know that the fault was not more in Mr. Draffin than in Mr. Fothergill?—that the exposure was not over-timed? and I need hardly remind you that both reason and experience proves to us that the most sensitive surface requires the greatest nicety in regulating the exposure—or that dirty marks, from imperfect washing, was not the cause of failure.

In the picture of *St. Mary's Abbey*, the Fothergill is stated to have been exposed one minute, the Taupenot thirty-five seconds. The latter contains the figures of men filling a wheelbarrow, clear and distinct; in the former, the wheelbarrow and men are gone. Surely, if they were clear and distinct in the thirty-five seconds' picture, some decided trace of them should have been seen in the one which took only twenty-five seconds more. To me it seems clear that the pictures were not exposed simultaneously, and therefore have no value as a *comparative* experiment.

One very serious drawback to the Taupenot process is the blistering of the film. Mr. D. proposes as a remedy that the plate should be slightly warmed before coating; but unless he has omitted to act on his own suggestion, the specimens sent by him and developed at the last meeting, only proves that the old difficulty is not so easily or so certainly overcome. Several of the blisters certainly subsided as the plate dried, but still many show on the print which I took from it. With this exception the print is very beautiful; and I feel sure if Mr. Draffin will bestow the same care, skill, and perseverance on Fothergill that he has done on Taupenot, he will soon be brought to admit that the former will yield him more half-tone and detail than can be got by the latter. I admit that Fothergill requires great care in manipulation, and is altogether more difficult to manage than Taupenot; but if we are to discard it on that account, there will be an end to all progress. I do not wish to disparage the older process, by which many operators obtain excellent results; but I submit, when the question of sensitiveness, now much increased by the gum and chloride of ammonium modifications, is taken into consideration, along with the results obtained, no dry process at present before us offers so many inducements to operators as the one submitted to the public by Mr. Fothergill.—Yours, very truly, JOHN HEYWOOD.

MR. ROGERSON believed that generally speaking the Fothergill process was the most sensitive, but this quality depended on the amount of washing, the quality of the collodion (which notwithstanding the improvement in its manufacture of late, still varied greatly in its properties, scarcely two samples from the same maker ever being found uniform), and also the condition of the bath. He believed one cause of failure was the general practice of using so small a quantity of the bath solution, that after a very few plates were sensitised the strength became greatly lowered, and after two or three doctorings it was impossible to know without making an analysis what the strength or condition of the bath was. He used a bath that contained £5 worth of nitrate of silver, and when made correctly to begin with, he could use it for a very long time with uniform results; it was nearly neutral, and when it became necessary to use any acid he added nitric in preference to acetic.

Mr. WARDLEY gave the preference to Taupenot, though he believed Fothergill was superior in sensitiveness, and also in keeping qualities: the former, however, was not so very decided as to constitute any important advantage; the latter he attributed to the layer of albumen, which acted as a sort of varnish to protect the sensitive surface from atmospheric influences. His great objection to the Fothergill process lay in the great difficulty in preparing the plates, more particularly large ones, so as to be free from markings. He regarded it as next to impossible to wash with so small a quantity of water as to leave the free nitrate of silver in a state of even dilution all over the plate; and if recourse was had instead to a weak silver bath, he fancied the same result would be produced, as the plunging or rocking motion caused the water to act with a wave-like force more on the centre than the sides of the plate. The great advantage in the Taupenot process was the ease and certainty of its preparation. He agreed with Mr. Draffin that the quality of the collodion and condition of the bath might vary within very wide limits without producing any marked influence, whilst no injury could be done with any amount of washing, and the film would bear even rough usage. Great objection was raised to the liability of the film to blister: this, no doubt, was a serious drawback, and in many instances could not be obviated; but much might be done by exercising care in preparing the plates in a dry atmosphere, and drying them before the fire after coating with albumen. In the print taken from the negative sent by Mr. Draffin, and which was developed at the last meeting, he thought the blisters might have been so far removed as to prevent them affecting the print, if they had been rubbed with a little cotton wool and water, taking care not to make the plate too damp.

Mr. WHAITE thought that the new modification proposed by Mr. Lloyd, of flushing the plate with a very diluted albumen after sensitising, tended very much to prevent markings.

The conversation subsequently embraced a variety of subjects, chiefly relating to practical details, in which many members joined. Mr. Wardley produced a print of the white marble statue of the Queen, in Peel Park, to illustrate his assertion at the last meeting, that feeble skies were no proof of over-exposure. The principal object in the picture gave a brighter reflection than the sky, and though by no means over-exposed, the sky had printed through considerably. He mentioned, also, that he had treated some plates that had inadvertently become exposed to the light with a solution of iodide in alcohol, and after dipping again in the nitrate bath the plates were restored to their original sensitive condition.

The CHAIRMAN then announced, that in accordance with a resolution lately passed, the next meeting would not take place until the 14th of September; and he hoped the interval would be productive of successful results, and that the experience gained at these meetings would now be found of practical utility.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE members of this Society held their last meeting for the present session on Tuesday evening, the 31st ult., at the Odd Fellows' Hall. WILLIAM HOWELL, Esq., one of the Vice-presidents, occupied the chair, and there was a numerous attendance, several ladies being present.

After the usual preliminary business had been disposed of, a letter of apology was read from the Rev. William Law, who, unable to be present on account of illness, sent the promised paper, and requested either the secretary or the treasurer to read it to the meeting.

The treasurer, Mr. OSBORN, said that no one more than himself regretted the absence of the reverend gentleman, as the paper would lack much of its interest from its being unaccompanied by the genial manner and manipulative skill of the author; but as he (Mr. Osborn) had had considerable experience in Dr. Hill Norris's dry process, he would venture, at the conclusion of the paper, to occupy a short time with some details of his own experience.

Mr. Osborn then proceeded to read Mr. Law's interesting paper upon *Dry Processes and their Difficulties.* [See page 147].

Mr. OSBORN said that amateur photographers, as a rule, were too much given to change; they could not take up a process and deliberately work it out. He pleaded guilty to this charge himself, but thought he had been tolerably faithful to the dry collodion process of Dr. Hill Norris, having practised it for two years, and being now able to produce by it results quite equal to the wet collodion in detail and half-tone. The principal drawback, as necessarily it must be with all dry processes, was a want of sensibility, and if this could be overcome, he had no doubt Dr. Norris's process would take the lead as a dry process. Fothergill's method was correct in principle, and hence the good results which had been obtained. If, therefore, the final washing off the excess of the preservative solution were applied to Dr. Norris's method of preparing plates, they would get from fifteen to twenty per cent. of increased sensibility. On Saturday morning last he (Mr. Osborn) took an excellent negative in a bright light—exposed two seconds, Ross's stereo lens four-and-a-half inch focus—quite as full of detail as any dry plate he ever saw. In his opinion the Doctor's plates were more easily prepared than Fothergill's, because their preparation could be reduced to this simple expression, namely, cleaning plates, coating with collodion, sensitising, thorough washing with plenty of water poured on gently from a jug, coating with the gelatine solution, which may be used cold, and when properly made will keep any length of time; and finally washing until all greasiness disappears: the exposure, say two minutes to Fothergill's one minute, which latter statement was, he (Mr. Osborn) thought questionable, as he never saw a good Fothergill with less exposure than two-and-a-half or three minutes. As for the developement, he could develop Norris's plates in from five to seven minutes, while he was told that the Fothergill plates took from one to three or four hours occasionally. This was a manifest advantage. For cleaning glass plates quickly he could safely recommend Solomon's diamond polish, which he had used with great success and increasing pleasure.

After some discussion on one or two points noticed in the paper, the best thanks of the meeting were given to the Rev. Wm. Law for his interesting communication.

Mr. MORRIS, with a few appropriate observations, then introduced Mr. Woodward, of Baltimore, United States, to the meeting. This gentleman is the inventor of the solar camera, now extensively used in America.

Mr. WOODWARD said that before exhibiting the prints he had brought with him, he would remark that the instrument he had invented, and which was exhibited before the Society last year, did not appear to be perfectly understood in this country. The solar camera, as its name implied, was an adaptation of the principle of the solar microscope to the ordinary camera, for the purpose of obtaining a light sufficiently strong to be used for enlarging small photographs. He (Mr. Woodward) was an artist by profession, and it had often occurred to him that if he could get sufficiently enlarged copies of ordinary photographs, to paint over on canvas, it would be a great assistance to him. Following up the idea, he had at last succeeded in producing the invention then before them. One advantage to which he would call attention was, that it was not at all necessary to have a dense negative for the purpose of enlarging, as a positive answered admirably, thus enabling them to take instantaneous portraits, as, for instance, of children, and afterwards enlarge them to any size. Another advantage was that there was no spherical aberration about the image. They knew of course that the use of a diaphragm in the lens tube was to flatten the image; he (Mr. Woodward) had accomplished this by placing the condenser in such a position that the point where the rays of light crossed should answer to the diaphragm ordinarily used. By this means he had no loss of light, and at the same time got the image free, or nearly so, from spherical aberration. Another advantage of the solar camera was, that the pictures might be printed direct upon the sensitive paper, thus avoiding the necessity of making a second negative, or of developing a paper picture. He generally used the ammonio-nitrate paper, and sometimes albumenised paper.

Mr. WOODWARD here exhibited a number of very large pictures, enlarged from mostly half-inch negatives, and excited the wonder of the members by exhibiting a life-size half-length portrait. Amongst other specimens were an instantaneous portrait of a child, enlarged to about sixteen inches by twelve inches; a copy of a map, about two feet six inches by twenty inches; several very large portraits and landscapes; and one landscape about forty inches by thirty inches, all of these being sharp and clear to the edges, and free from any apparent distortion or spherical aberration. The map showed a little curvature, arising from a portrait combination having been used for the original negative.

Mr. WOODWARD said the power of the instrument had been put to a very severe test by the United States coast survey. It was desired to ascertain how far it would be practicable to enlarge small copies of maps to scale, and for this purpose a sheet of paper was prepared with geometrical squares crossed by diagonal lines. A collodion positive was taken of this, and projected, magnified eighty times, on a screen covering one hundred square feet. The image was found, on accurate measurement, to be geometrically correct, the lines, &c., being all free from curvature to the edge.

In reply to a question,

Mr. WOODWARD said that the life-size picture took forty-five minutes in the printing.

Mr. JOHNSTONE wished to know how the correction of the error of curvature could be accounted for, because theoretically there ought to be a great amount of curvature.

Mr. WOODWARD replied that he was not able to enter fully into the theoretical argument; he could only point to the pictures exhibited as a practical overcoming of the difficulty.

A discussion respecting the application of the principle then took place, in which Messrs. Howell, Ball, Morris, Osborn, Whitlock, and others took part, and to which Mr. Woodward courteously replied, giving much information, suggesting, amongst other things, that it was better in taking pictures for the purpose to work under the full power of the lens used, thus taking half or quarter plate pictures with a full plate lens, &c.

The thanks of the meeting were then cordially given to Mr. Woodward, and the meeting adjourned until August.

It is understood that the instrument is likely to be extensively used in Birmingham, several of the largest operators having signified their intention of purchasing. It was considered by the meeting destined to create quite a new era in photographic portraiture. The astonishing size of the pictures exhibited, all of them pure untouched photographs, seemed to take every one by surprise.

Exhibition.

THE EXHIBITION OF THE FRENCH PHOTOGRAPHIC SOCIETY.

IN order that our readers may possess a perfectly unbiassed account of the important exhibition of photographs, now on view at the "Palais des Champs Elysées," at Paris, we have, in addition to our usual Paris correspondent, retained the services of an *English* gentleman at present on the spot, so that, besides our ordinary source of information, we are enabled to obtain and give an account of the display from an *English* point of view. We have a word or two to say by way of preface, to guard against future misconception. Our correspondent, besides being a photographer, is a very ardent admirer of works of art generally, and consequently we find him laying more stress than we should personally do on the success of those following that branch of our art which the French happily term *re-production*—an important branch no doubt—but one that, in our own opinion, ranks far below photography from nature, whether in landscape, portraiture, or *genre* subjects. The following is therefore the account

FROM OUR SPECIAL CORRESPONDENT—

Paris, 1st June, 1859.

The Third Exhibition of the French Photographic Society is alike remarkable over its predecessors for the excellency of its habitation and for the general superiority of the works exposed.

This year it is, with the authorisation of the Minister of State and the imperial director of the fine arts, held in a part of what was, in 1855, Le Palais de l'Industrie, but as it is now called Le Palais des Champs Elysées; and its extent will be readily understood by the English visitors who remember the space in the south gallery occupied by the productions of Prussia, Baden, Bavaria, and Germany, the entrance being by the beautiful staircases in the south-west pavilion, and which are so large and extensive as to provide for the rapid entrance or exit, free from any danger, of an immense multitude—indeed, on one occasion, 15,000 people leisurely retired from this palace in eight to ten minutes, a feat not to be accomplished at any public building in London. On one side of these pavilions, approached from corridors of three to four yards wide, are retiring rooms, lavatories, &c., for ladies; and on the reverse side the same accommodation for gentlemen —while for light, ventilation, convenience and beauty, the whole edifice may be taken as a model for English architects to start from. On the exterior of the palace upon the frieze to the ground story, and which runs all round the building, are carved in large letters and gilt the names of men of all times and countries, celebrated in the arts, sciences, philosophy, &c.; and it is singular that it should so happen, that the first name on the frieze to the entrance to this Exposition is that of Daguerre.

The Society invited all photographers, French and strangers, to forward works which would be submitted to the examination of a jury consisting of amateurs and professional men, charged to decide on their admission or rejection, whose names were published at the time when the general invitation was given, and which were communicated by your Paris correspondent. This was a guarantee of good faith on the part of the Society, that a proper supervision would be exercised in the selection of works to be exposed; and it is understood that the censors have had occasion to put their veto upon some of the works forwarded by French artists, but not on any from England. Rumour says, that of the works rejected was one by Bilordeau, a large portrait of a person in the act of cutting his corns; and although the focussing was probably sharper than the knife used on the occasion, this could not save the contribution of corn-cutting from being returned to its author, and who has since reaped on its account a considerable quantity of "chaff." The like authority informs us that the frame of visiting cards representing the portraits of a branch of the imperial family, which are really so unsatisfactory as photographs, only rode out the storm of condemnation raised by the jury, and anchored safely in the space allotted to Disderi and Co., through motives of deference to august personages so misrepresented.

The space allotted to the Society is arranged into a number of courts, by partitions under three yards in height — the first four have for centres, the square balustraded areas which partly light and ventilate the ground floor of the palace under the galleries. These balustrades support a continuous narrow table, which runs round each area, and upon which are placed stereoscopes of all shapes and fashions, and were a great attraction to visitors, who examined with interest the many slides laid upon the tables; but especially the American stereoscope, which by the simple turning of a revolving knob by either hand, while the eyes of the beholder are placed at the lenses, exposes successively several dozen of views. The appearance of these stereoscopes is very good, being suitable for the drawing-room. The four sides of the courts have narrow counters, which serve as elbow rests, and for making minutes in the catalogues, while the visitor is examining leisurely the photographs hung above to the upright screens, and which is a very convenient arrangement, the entrance from court to court being at each corner. The contributions from England, Belgium, Russia, and Germany, are hung to the ordinary upright screens without the counters in front. The covering of the whole of the screens and tables is of a glazed dark sea-green coarse calico, and forms a good background for the various tones of the photographs, and which are, generally speaking, very well lighted, the roof over this gallery, of iron and glass, being at an altitude of upwards of ten yards.

The contributions of those artists who have sent only a few works are not sufficiently separated from each other, and it takes some trouble to discover whose they are. This might have been easily obviated by a coloured cord or ribbon nailed on the screen, and surrounding the frames of each contributor, so that one could see at a glance where each exhibitor's works began and finished, especially if the name and address of the exposant had been fixed on the upper part of the space occupied by his works, in lieu of as now being wafered on to the middle frame, the other proofs being without name or easily distinguished mark — of course, with some of the principal exposants (such as Bingham), who occupy the whole side of a court, this uncertainty does not exist; and in others, their names are stuck on every proof, offensively enough, and too much in the advertising style. The French universally make a mess in the printing of English names and places, and here we find described the respected partner of Mr. Maull as "Folybanc," exposant, from Londres. Robinson, of Leamington, is re christened as "Monsieur Henri," but our friends understand well the advantage of resting the eye when fatigued with examining works of art, and know that it requires some relief when wearied, so that it may regain its pristine force to appreciate every nicety of form and colour — this is provided for by two bays of the colonnade next the nave being left open, so that the visitor may let the vision rove over the beautifully arranged garden occupying the whole of the nave, in which are arranged, with charming taste, the floral contributions to the show of the Horticultural Society, and the statuary forming part of the Exposition des Beaux Arts; the whole making up a very agreeable picture of winding walks, beds of flowers and plants, rustic stepping stones across a running stream, spanned by a picturesque wooden bridge, fountain, undulating grass-plats, a view the *tout ensemble* of which is rarely to be seen.

The arrangement of French catalogues does not give much assistance in systematically reviewing a miscellaneous exhibition—the general plan being to take as a basis the alphabetical arrangement of exposants' names, their works being numbered consecutively in the catalogue, while the hanging is altogether independent of the numbering, thus: — the first, Mr. A., is hung — the second on the list of A's is in probably quite another part of the exhibition, and one must have a considerable knowledge of an exhibition before he can proceed to follow any plan for reviewing the same, and more so for the purposes of study. Take the catalogue of the exhibition of pictures by living artists now open at Paris, where the alphabetical arrangement of exposants' names is followed: you find No. 1; probably 380 will be the next picture hung to it; and No. 2, the work of the same artist as No. 1, will be in another saloon, and cannot be found except by searching every room till it be discovered; for there is not the least indication in the catalogue where a picture is hung. This is a source of great inconvenience and loss of time. I think the catalogue of the Royal Academy is worthy of imitation here, for in it it is clearly stated No. 1 begins over the door of the first room, and the pictures are numbered following each other in the places they occupy all round the room. You then go into the next room, commencing over the door, and so on to the last. Then, at the end of the catalogue is an index of the exhibitors and the numbers of their works, so that if you want to examine, seriatim, the labours of one painter, you turn to the index and take the numbers attached to his name, and turning to the catalogue, the number gives you the room in which it is hung, so that you can easily go from one to the other. I name this more fully, so that next year the hint may be taken and acted upon, the advantage being evident.

I calculate, from the catalogue, the following statistics, which show the relative favour the various processes enjoy: the totals are only approximate because several exposants do not describe the processes by which their works were produced:—

Wet collodion	700	Collodion on paper, dry	9
Dry collodion	26	Waxed paper	200
Taupenot	55	Waxed cloth	17
Collodio-albumen	10	Waxed turpentined paper	1
Preserved collodion	1	Paper, wet and dry	43
Collodion and honey, dry	4	Albumen	8

With positives fixed without hypo'; positives by the process of M. Charles Nègre; gravure heliographique; and photo-chromie, by Testud de Beauregard, give us a variety, though not always charming. *(To be continued.)*

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER III. *(Continued.)*

UPON COLOUR.

"If we place a bright red wafer upon a sheet of white paper, and fix the eye steadily upon a mark in the centre of it, then if we turn the eye upon the white paper, we shall see a circular spot of *bluish green* light of the same size as the wafer." * * * "If we make the preceding experiment with differently coloured wafers,

we shall obtain ocular spectra, whose colours vary with the colour of the wafer employed, as in the following table :—

Colour of the Wafer.	Accidental Colour.
Red	Bluish green.
Orange	Blue.
Yellow	Indigo.*
Green	Violet reddish.†
Blue	Orange red.
Indigo	Do. yellow.
Violet	Yellow green.
Black	White.
White	Black."

Sir David also adds —"As in acoustics, where every fundamental sound is actually accompanied with its harmonic sound, so in the impressions of light, the sensation of one colour is accompanied by a weaker sensation of its accidental or harmonic colour. * * * * The term *harmonic* has been applied to accidental colours, because the primitive and its accidental colour harmonise with each other in painting."

The student will now perceive that the mixture of two primary colours in due proportions produces that hue which is complementary to the colour remaining, as blue and yellow forming green produce the complementary of red, red and yellow that of blue, blue and red that of yellow. If you place green beside red, each colour contributes additional brilliancy to the other, the green imparting its accidental or complementary red, and the red is green. The same may be said of both the primaries, and all the various hues obtained by combination, every hue and colour being capable of receiving fresh power, by being placed near the hue or colour which is its complementary.

In practice this principle should never be lost sight of: it may be applied with varied results according to circumstances, viz.—if the red should not be the primary or pure red, the complementary colour also varies, becoming more blue if the red approach orange, and more yellow if the red be purplish, &c.

RULES OF ART FOUNDED ON SCIENCE.

Every healthily organised eye recognises the effect of colour, and is susceptible of pleasant sensations from its harmonious arrangment; hence arise those rules and principles existing in the works of all our greatest and most of our early masters, which have since received confirmation from the discoveries of modern science; and although a new and eccentric school of painting has achieved some notoriety, by setting such rules and principles at defiance, truths based upon the experience of great men who were practical illustrators of the precepts they taught, which have been adopted by generations of critics, and proved by the evidence of scientific facts, must eventually triumph over the eccentricities of those whose morbid cravings for novelty and originality could find no better outlet.

I trust the reader will not therefore listen to any who would rob that grandly powerful and supremely beautiful "language of the light colour," of its noblest attributes and most effective uses. Learn to look upon this portion of your art as a glorious field for the intellectual battles of an earnest art-interest — to see it stretching before you full of smiling promises, calling up the memory of its illustrious conquerors, and fraught with the hopes of yet unconquered realms. Landscape and historical painters can, of course, march farthest into the realms of this beautiful world of colour, but there are no lack of laurels within the grasp of even photographic colourists.

CONTRAST.

Sir David Brewster states, that "when the eye has been strongly impressed with any particular species of coloured light, and when in this state it looks at a sheet of white paper, the paper does not appear to it white, or of the colour with which the eye was impressed, but of a different colour, which is said to be the accidental colour of that with which the eye was impressed." From this fact arises the necessity of studying colours, not only in reference to their individual intensity and power, but also in reference to their effect in combination. For instance, the *accidental* or *complementary* colour of red being green, if I place red beside another colour, the latter receives therefrom sufficient green to mar or increase its intensity, character, and beauty, according to its nature. The celebrated M. Chevreul's work on colours ‡ contains an anecdote in point.

"A few years ago," says the author, "the proprietor of one of the first manufactories in Paris, wishing to print grey patterns upon grounds of apple green and of rose, refused to believe that his colour preparer had given any *grey* to the printer, because the designs printed on these grounds appeared coloured with the complementaries of the colour of the ground."

The grey appeared green on the rose ground, and rose upon the green ground, and doubtless caused no little annoyance and perplexity.

Sir David Brewster details so clearly his experiments and their results, that I cannot do better than again quote from his work on optics.

To describe the colours already named more fully, red is the most powerful, yellow the most luminous, and blue the most retiring (these three colours are termed *pure*). Orange is warm and advancing, partaking of qualities belonging to its components; green, mean and weak in itself, is nevertheless soothing and kindly in its effect, and of great practical use in heightening and contrasting other colours or hues; and purple, sombre in its near relation to shade, is yet of great utility and beauty; citrine bears the same relation to the other two tertiaries, russet and olive, in its degree, as yellow to the other primaries; russet (partaking largely of red) claims its due proportion of that colour's qualities, while olive is the humbler representative of blue and green.

Descending yet lower in the scale, we pass through the various browns into the neutral tints ending in that which represents the absence of all light, and consequently colour *black*.

Every *colour* has its *scale*, graduating in strength, until it is lost in white upon the one side, and in black upon the other; the one half being composed of its *tints*, and the other of its *shades*, the use of white forming the first, and the addition of black the last — *hues* or compounded colours obey the same law.

RESUME.

I have now endeavoured to show that, strictly speaking, we have but three *colours*, namely, red, blue, and yellow — that the mixture of these in various proportions form *hues* — that the addition of light, or its representative, among pigments, white, creates *tints*, and the addition of black, *shades* — that shades and tints form *scales* — that colours are warm and cold, advance and retire — that some are allied to light, others to darkness — that some excite and others soothe, &c. — the importance of contrasting colours with each other, because both give and receive thereby fresh beauty or power. In reiterating these principles I wish to impress them firmly on the mind.

Independently of absolute contrast of colour, attention must also be directed to the effects produced by contrasts of intensity; black bestowing its complementary *white*, gives and receives intensity; all hues partaking therefore of black receive in proportion the force bestowed by their complementaries. If you place in juxtaposition a strip of black and another of white cardboard, where the white joins the black it will appear lighter than parts more removed from its influence, and where the black touches the white, it will appear darkest. It follows, therefore, that colours contrasted with white appear deeper at the point of contact, and others contrasted with black will for the same reason appear lighter. Too strong a contrast of intensity, like too violent a contrast of colour, should however be avoided, such contrasts appealing to the skill and genius of the painter for their most harmonious results.

Besides the harmonies of contrast and intensity we have what is sometimes termed the harmony of analogy, produced by the various tones and hues of a single scale, or of the colours and hues placed in the order in which they are found in the solar spectrum. The further application of these principles will be illustrated during our progress through the more practical portion of my instructions.

(To be continued.)

Letters to a Young Photographer.

No. XII.

MY DEAR EUSEBIUS,

Conceit is a weakness to which photographers are by no means subject: in fact, I think they are *ex officio* exempt from it. I do not remember that I ever encountered a conceited photographer in my life. It is true that some are prone to indulge in the free use of superlatives and expletives when speaking of their own productions, but that is only a pardonable vanity, very admissible in newly-fledged photographers. They take it as babies take the measles, and with careful nursing they get safe through it. As a general rule, the worthy craft of photographers, to which you and I have the honour to belong, are too modest by half, which

* Or the cold purple which indigo in the pigment appears.
† Painters say red.
‡ A work I very strongly recommend.

I think a pity, for no man gets through life successfully who is too modest. *Brass*, my dear Eusebius, is the true philosopher's stone of the nineteenth century: it has the wondrous power of transmuting ignorance and impudence into gold—pure, bright, gold.

I do not think *you* at all conceited when you tell me you have succeeded in getting the best picture you ever saw—no, not conceited at all! Of course you are the best judge (of your own productions), and think you know a good picture from a bad one, when you see it. But somehow or other it happens that the first tolerably good picture a young photographer gets is always "the best he ever saw." Of course, my dear Eusebius, we old boys who know what is what, do not take this expression quite literally, we generally make a discount of about ninety per cent. off these early blossoms, and then we come pretty near the mark. But you want my opinion of your picture? What do I think of it? I suppose you expect me to be candid, and to use no soft-sawder. So this is what I think. Your picture is very fair for a green hand, but not so good as to encourage you to hope you will become entitled to the gold medal prize at the next exhibition. But lest you should feel disappointment, and become disheartened in not obtaining the reward you doubtless consider your due, I will magnanimously present you with a first-rate washed *meersham* (I bought it in the street for a penny), accompanied with four ounces of the best 'cuaster, as a token of my high esteem and appreciation of your embryo skill, and your untiring patience and assiduity. Continue in the course you have so auspiciously commenced, and if wind and tide favour your onward course, who knows but some fine day you may be appointed photographer-in-chief to the sable King of Dahomy!

You have now to learn how to take positives upon glass, or *direct* positives, as they are called. Such pictures have many points of resemblance to Daguerreotypes. They present a very similar appearance. They are not multiplied by printing, like negative *clichés*; but they satisfy the wants of the public for a cheap picture, taken and delivered while the customer waits; and, in a commercial point of view, they are the most profitable to the artist. The larger portion of the photographic business is carried on in positives, which are offered, in certain cases of rivalry, "at the small charge of threepence, case included."

You doubtless understand that a positive is a picture to be viewed by reflected light; that is, you do not look *through* it but *on* it; consequently, the light and shade must be in their natural places, and not reversed, as in the negative. The manipulations vary somewhat from those employed in the negative process. You require a different kind of collodion, you expose less in the camera, and you employ another developing agent.

Doubtless, in your efforts to obtain negatives, you have occasionally produced positives, rather dingy-looking, perhaps, but still such as will have given you an idea of what they are like. The effect might have been very much heightened if you had poured over your picture a quantity of a saturated solution of bichloride of mercury; the picture would have become white all over, and when washed with water, and afterwards treated with hypo. as usual, you would have got a brilliant positive, which, when backed with black varnish or leather, would have shown you one of the protean forms of our black art.

Collodion for positives is required to be much thinner or weaker than for negatives. Some operators prefer iodising it with iodide of ammonium. Some say that any old collodion will do, provided it be diluted with alcohol and ether. The following formula yields a very good positive collodion:—

Ether	20 ounces.
Gun cotton	1 drachm.
Alcohol	20 ounces.
Iodide of potassium	1 drachm.

This collodion contains about half the usual quantity of gun cotton and iodide in negative collodion; so you arrive at the same result by diluting negative collodion with alcohol and ether until the film on the glass takes a blue tint in the nitrate bath. The exposure in the camera will be about half that required for a negative.

It is of the utmost importance that the glass plates be scrupulously clean, as the least speck of dirt or film on the glass shows as a defect in the picture when developed. The light portions of the picture are formed of a deposit of bright metallic silver, the shadows are the transparent glass, through which the dark backing is visible. It is therefore very evident, if any foreign matter adheres to the glass plate, it must become very palpable to the sight upon the most cursory examination.

You must make a new nitrate of silver bath for your positives: it requires to be of less strength than that for negatives; and also to be acidulated with nitric acid, as follows:—

Nitrate of silver (crystallised)	5 drachms.
Water	12½ ounces.
Nitric acid	2 or 3 drops.

There must be a certain relation between the strength of the collodion and the strength of the nitrate bath. This it is scarcely possible to determine, except by direct experiment. Sensitiveness of the film and intensity of the image are the points of consideration, and will influence your proceedings when you have arrived at the point of understanding the chemical philosophy of photography.

You require to be particular in the selection of the nitrate of silver with which you make your bath. I recommend the pure crystallised, because it is safe. Fused nitrate is apt to contain a basic nitrite of silver, and give an intense, misty, solarised picture.

The developer for positives that yields the best results is sulphate of iron. Pyrogallic acid gives a dull yellowish picture, which is quite repulsive, unless nitric acid be substituted for acetic acid, then the image is very white, but looks chalky or opaque: here is a formula if you wish to try it:—

Pyrogallic acid	1 grain.
Water	1 ounce.
Acetic acid	20 minims.
Alcohol	50 minims.

You will develope with sulphate of iron: the best formula is that of Messrs. Davanne and Joüet, being that which produces the purest whites:—

Water	12½ ounces.
Alcohol	5 drachms.
Acetic acid	5 drachms.
Sulphate of protoxide of iron, in crystals	4 drachms.
Sulphuric acid (by weight)	1 drachm.
or by measure, 0·58 drachm.	

The proof developes rapidly; therefore, I should counsel you to employ, at first, a vertical or horizontal bath for this solution, so that the development may take place uniformly all over the proof.

When developed, wash the plate freely with clean water and fix with cyanide of potassium, of the strength of one per cent. Place the proof over a black ground, and if it has been well executed a brilliant picture will be apparent.

You can also fix with hypo.; but then it is necessary that the proof be thoroughly washed from the developer, otherwise, if any acid remains, it will decompose the hypo. and cause the picture to be veiled, or become black or grey, through the formation of sulphide of silver.

When dry, the proof may be varnished in the usual way, and afterwards covered with a black varnish, which you make as follows:—

Rectified turpentine	12 ounces.
Powdered bitumen	2½ ounces.
White wax	½ ounce.
Lamp black	1 to 2 drachms.

Cover the picture by means of a soft brush, and when nearly dry, apply a piece of paper to the varnish, to protect it from scratches.

Photographic Glossary.

Nitrate of Ammonia—A salt formed by the combination of nitric acid with ammoniacal gas. It is in the form of prismatic crystals. It is deliquescent in the atmosphere, and dissolves in rather more than its own weight of water. Nitrate of ammonia is a solvent of oxide of silver, but it is not often employed in photography.

Nitrate of Baryta—A salt composed of nitric acid and oxide of barium; permanent in the atmosphere; dissolving in twelve parts of cold and in four parts of boiling water. It is used in photography to obtain proto-nitrate of iron, by decomposing with it a solution of protosulphate of iron.

Nitrate of Cadmium—A deliquescent salt formed by the union of nitric acid with oxide of cadmium. When collodion is iodised with iodide of cadmium, nitrate of cadmium is formed in the sensitising bath, which some operators consider is apt to injure the sensitiveness of the film and induce *fogging*.

Nitrate of Copper—A salt formed by the combination of nitric acid and oxide of copper. It forms crystals of a splendid blue colour, very soluble in water. This salt is very caustic,

corroding the skin; its taste is insupportably styptic. It ap- appears in some formula for developing collodion negatives, in conjunction with pyrogallic and tartaric acid, and is said to make the image appear as quickly as sulphate of iron.

Nitrate of Iron—There are two nitrates of iron: the nitrate of the protoxide and the nitrate of the peroxide. The first, usually called the proto-nitrate, is in emerald green crystals; it is readily obtained in solution by adding a solution of nitrate of baryta to a solution of proto-sulphate of iron. It is a deoxidising agent, and is employed as a developer for collodion positives.

Nitrate of Lead—A white anhydrous salt consisting of nitric acid and oxide of lead; soluble in eight parts of water. It is sometimes substituted for nitrate of baryta in preparing the developer for positives; it is also added to gallic acid to enhance its developing properties.

Nitrate of Magnesia—A salt once in great repute for its application as a preservative agent in the collodion process; its deliquescent properties kept the collodion in a moist state. It has been superseded by glycerine, honey, meta-gelatine, &c.

Nitrate of Potass—Nitre, saltpetre. This well-known substance is used in the preparation of pyroxyline. When sulphuric acid is poured upon it decomposition ensues, and the nitric acid, in combination with the potass, is liberated.

Nitrate of Silver—One of the most important salts employed in photography. It consists of nitric acid in combination with oxide of silver; crystallising in large, flat, six-sided plates. It appears also in commerce as *fused*, taking the form of the mould. It is soluble in about its own weight of water, and almost insoluble in cold alcohol. In moist air it slightly deliquesces. The solution of this salt is quite colourless, and it is not affected by light unless organic matter be present with it.

Nitrate of Uranium—A salt which has lately become very familiar in photography, through the experiments of Mr. Burnett and M. Nièpce de St. Victor. There are two nitrates of uranium, the proto-nitrate and the pernitrate; the latter is the one employed; it is a nitrate of the sesquioxide of uranium. It crystallises in the form of yellow prisms, which effloresce in the atmosphere, and are very soluble in water, alcohol, and ether. It is sensitive to the action of the chemical rays of light, and is employed in positive printing.

Nitrate of Zinc—A compound of nitric acid and oxide of zinc. It is a deliquescent salt, and has been proposed for preserving collodion plates, in the same manner as nitrate of magnesia, and with the like success. It is also added to the developing solution formed of gallic acid, as a partial substitute for acetic acid.

Nitrate of Silver Bath—The solutions of nitrate of silver employed for sensitising collodion plates, and for exciting positive paper, are usually termed "nitrate baths." The formulæ for these several baths are given in all treatises on photography.

Nitric Acid—This acid is composed of five atoms of oxygen and one atom of nitrogen, combined with one atom of water; it is then called monohydrated nitric acid. At ordinary temperatures it is liquid, colourless, fuming in the air, and very corrosive. It serves to prepare all the nitrates, as described above, and mixed with hydrochloric acid, it forms *aqua regia*, a solvent for gold. In a concentrated state nitric acid does not act upon silver, tin, or copper; the addition of water is required to furnish oxygen to the metal. When the metal is oxidised, the nitric acid attacks the oxide and converts it into a nitrate.

Foreign Correspondence.

Paris, June 10th, 1859.

You must not expect much from me, except belligerent photography, until the war is over. Our art is fairly enlisted, and we must be content to accept its war-offerings which may throw some new light on the resources and appliances of heliography. M.M. Bisson Frères are now busily engaged upon a very interesting subject. Sometime ago, the Austrian government published a very beautiful elaborate map of the Lombard-Venetian kingdom, the capital of which is now occupied by the Allies. Previous to the war this map was sold to whoever wished to buy it; but it has since been withdrawn from circulation. One of our map-publishers happened to possess a copy of this map, now become so interesting and valuable, and also greatly in request. To re-engrave it would have been out of the question; so photography, with its *hey! presto!* despatch, was called in to do the work of supplying copies. The map was so large that it became necessary to divide it into several portions to meet the resources of the camera. The task of copying these several portions, so as to unite again into one harmonious whole, was one of very great difficulty; but it has been admirably overcome by M.M. Bisson. The reproduction is perfect—the name of every place, every contour, which demanded so much time and labour from the engraver, is brought out in the twinkling of an eye. Great are the triumphs of photography!

M. Chevallier has made a very ingenious and useful application of photography to topographic surveying. The details are too extensive to come within the limits of a letter. He calls his apparatus the photographic plane-table: it consists of a solid tripod of ordinary wood, around the axis of which the camera is made to traverse, so that the *objective* can be presented to any part of the horizon desired. The collodioned or albumened glass-plate is circular, and is held in a concentric frame of the same form, the periphery of which is furnished with teeth, like a cog-wheel. The frame and glass-plate can also turn around a common axis which passes above the photographic image, so that the latter can be projected entirely upon the lower part of the plate, and be limited laterally by two systems of shutters, either by two verticals brought as near to each other as possible, or by two perpendiculars, concurrent with the centre of the plate, and embracing an angle as sharp as can be desired.

From these arrangements it happens that, without removing the plate from the interior of the camera, we can, by turning it on its axis, present it to various parts of the horizon in succession, thus obtaining sectional pictures which, when united, form a complete panorama of the locality.

There are, of course, many minor details necessary to secure perfect integrity of the angles, &c., which belong more to the engineer than to the photographer. The invention has been examined by Professor Benoit, who has reported favourably upon it to the Society for the Encouragement of Arts.

Mr. Young's interesting experiment of developing negatives in daylight has led to new investigations on the nature of the composition of the photographic image. M. Davanne announced his theory, which was as follows:—That the image appeared, not because the developing agent continued the reduction begun in the iodide of silver, but because the developer in contact with the nitrate set the molecules of silver free, and these latter fixed themselves upon those parts which the light had influenced. For, in fact, neither gallic nor pyrogallic acids, nor protoxide of iron alone, ever developed an image formed solely of iodide of silver. If the image appeared, it was because the iodide was mixed with a greater or lesser quantity of nitrate.

The part the developer plays is then *not* that of transforming an invisible sub-iodide of silver into visible metallic silver, as suggested by M. Leon Kraft.

The negative photographic image is produced, not by the reduction of the sub-iodide, but by a metallic deposit. To be convinced of this, it is only necessary to test the quantity of silver contained in the sensitive coating before the developement of the proof and after developement. It will be found that, upon an image completely developed, *even after fixing*, which removes all the excess of iodide, there is a quantity of silver greater than the whole of the iodide of silver contained in the sensitive layer before developement: there is then a deposit, and the photographic image appears because the molecules of silver deposit themselves upon the sensitive coating.

This deposit is due to a molecular attraction, the first molecule of silver being set free, the others group themselves around it, and attach themselves to it—just like what takes place in the formation of crystals.

But from whence comes the first molecule of reduced silver? The light has determined either the formation of a sub-iodide of silver, or the reduction of a part of the iodide of silver into metallic silver. In both cases the quantity of iodide modified is so small that it escapes the microscope (?), but the reactions which develop the image will prove that a modification has taken place. Doubtless there may be admitted, first, the formation of a sub-iodide of silver, by the luminous agency—then the decomposition of the sub-iodide into metallic silver, either by hyposulphite of soda, or by developing agents; but the image remains none the less invisible, and will only appear by the addition of nitrate of silver. As the sub-iodide must be decomposed, why complicate the ques-

tion by the presence of this useless sub-iodide at all, the existence of which is more than doubtful, as it has never been isolated, and is even not mentioned in our works on chemistry, when it is evident, both for the iodide of silver, as well as the chloride, that the prolonged action of light yields metallic silver? It seems much simpler to say that a luminous action, insufficiently prolonged, gives only a feeble quantity of metallic silver. Besides, it must be admitted that the sub-iodide of silver, or the intermediate body attackable, before as well as after the hyposulphite of soda, by warm diluted nitric acid, comports itself with reagents in the same manner as metallic silver; then, if it possesses the same properties, it must be one and the same substance.

To sum up what appears to be the explanation of the constitution of an image, the simplest view seems to be that which is in harmony with chemical reactions and photographic experience, and may be stated as follows:—

Light sets free some molecules of silver, in greater or lesser number, according to its intensity, these molecules are the first points of attraction.

The developing agents develop the image in so far as, mixed with nitrate of silver, they can set at liberty new molecules in much greater number, which proportionably group themselves around the principal nucleus points, and cause the image to appear with a rapidity that always increases in proportion as the centre of attraction becomes greater.

I shall be glad to see if, among your photographic philosophers, there is one who will give a better theory of the formation of the photographic negative image than the above. J. P.

Correspondence.

"THE GLYCERINE PROCESS" IN PHOTOGRAPHY.

To the Editor.

Sir,—In the last number of the *Journal of the Photographic Society* a paper is published which was read on the 10th ultimo to the Photographic Society of Scotland, *On a useful application of Glycerine in the Collodion Process*, by Mr. T. Rodger, of St. Andrew's.

Now, without any desire to claim your aid for the purpose of asserting our priority of publication, we ask leave to mention the following facts:—

A process identical with that of Mr. Rodger's paper, and used with exactly a similar object, was one among certain others that, in our hands, had for some time stood the test of actual work.

Deeming it, for reasons hereafter given, of some value, we published it, and other photographic improvements and propositions, in a pamphlet dated the 31st of March last. We may add that both before and since we have advertised this pamphlet in your paper, as at the command of any one who would send us three stamps, and that by such means it has been largely circulated.

Setting aside, however, our claim to priority of use and publication, we confess—assuming Mr. Rodger's paper to have been written without his being aware of our experiments—that we are much gratified to find that it confirms the value of the glycerine process. Supported, therefore, by this testimony, we would invite the attention of photographers, through your columns, to try the "plan for deferring the fixing of negatives," which we give from the pamphlet above mentioned, page 12:—

"After the application of any of the ordinary developers, and the usual washing—a small quantity of water being sufficient for this—coat the negative with *glycerine and water* mixed in equal proportions (pouring off the excess in the ordinary way), and put it carefully into the plate box. It can then be fixed after returning home, the next day, or indeed within any reasonable time; all that is required being, in the first place, to wash off the glycerine, and this it will be found can be done very readily.

"Nor is it necessary to obtain by the developement in the field the whole intensity the negative is capable of giving. Generally, in using the iron salts, sufficient is accomplished if all the required details of the picture appear; any degree of intensity can be got by using the formula given below, which was published by Mr. Shadbolt, in *The Photographic Journal*:—

"'Fix with hypo-sulphate of soda, wash well with common water, drain slightly, and then wash with a few ounces of distilled water, again drain, and pour on a solution in the proportions of—

Pyrogallic acid	2 grains.
Citric acid	1 grain.
Distilled water	1 ounce.

to which add about 20 drops of pure solution of nitrate of silver (about 30 grains to the ounce), but not that previously used for baths or any other purpose. Finally wash well: no more fixing will be required.'"

A few words in explanation, and we will trespass no further on your space. It is admitted that an important step would be gained if the means of working the ordinary wet process were rendered portable, convenient, and simple. This is chiefly our aim, it was the object of our glycerine experiments, and it was with the view of calling attention to the results at which we had arrived, that our pamphlet was published.—We are, yours, &c. MURRAY & HEATH.

43, *Piccadilly, W.*, 8*th June*, 1859.

[We have received the preceding since writing the remarks in our leader of the present number. The pamphlet alluded to we have had before us some time, intending to notice it, as one containing many very useful hints to amateurs and others. Want of space, from pressure of other matter, has alone prevented our doing so earlier.—Ed.]

MODIFIED META-GELATINE PROCESS.

To the Editor.

Sir,—The addition of *phosphate of soda* to the metagelatine solution, in the proportion of about one grain to the ounce, seems greatly to increase the sensitiveness, but not more so than a chloride of same base.

Should you think the above worth any thing, you are welcome to do what you like with it.—I am, yours, &c. D. W. HILL.

May 31, 1859.

POSITIVES ON OPAL GLASS.

To the Editor.

Sir,—The proceedings of our Society at the last meeting will clearly show that photographers, either professional or amateur, have nothing to fear from the use of opal glass, in consequence of any patent. This article is admirably adapted for photographs and portraits. The peculiar advantage of using opal glass is, that you have the picture as perfect by reflected as you have by transmitted light. I have tried to produce this effect by the ordinary process but have not succeeded. The following gives me all I can desire, and therefore I lay it before your readers with confidence. I herewith send you a specimen.

I may here remark, that a negative possessing fine detail is the best for this purpose, but there is no actual necessity it should be so.

1st. Dissolve pyroxyline in equal quantities of ether and alcohol, add chloride of ammonium to saturation. Allow this to stand for a night, and then it is fit for use.

2nd. Upon a well-cleaned piece of opal glass, previously coated with dilute albumen, and dried, pour this solution, as is customary with ordinary collodion, and sensitise in a forty grain neutral bath of nitrate of silver.

3rd. Drain, and then pour upon it a solution of gelatine, ten grains to the ounce, and five grains of honey. Allow it to dry either spontaneously or before a fire.

4th. Print upon this by superposition, as on the ordinary albumenised paper, until you see the edges slightly bronzed.

5th. Remove from the pressure frame, wash, colour slightly with gold, say half a grain to the ounce in distilled water, finish with solution of hyposulphite of soda, wash well, dry and varnish.

I may here state, that it is not imperative to use a pressure frame, as I use a board covered with a piece of black cloth, thus completely avoiding the risk of breakage.—I am, yours, &c. J. A. FORREST.

Liverpool, June, 1859.

[Notwithstanding your careful packing, the stereograph is broken in two pieces. The opal glass is, however, evidently capable of producing charming effects. For portraits the effect is very pleasing; the second sample sent arrived in perfect condition. It has all the beauty of a painting on porcelain.—Ed.]

ANHYDROUS ALCOHOL.

To the Editor.

Sir,—As the opportunity for a bit of photographic gossip with you occurs but seldom, I am induced to take advantage of a leisure hour, and make an observation or two on some of the contents of your late Journals, which I always read with much interest.

When Mr. Mayall read his paper on collodion, was there no chemist present to tell him that his method of preparing anhydrous alcohol could only be partially successful if one of the ingredients happened to be in excess? Both chloride of calcium and carbonate of potassa rapidly absorb water; but the salts which result from their mutual decomposition —chloride of potassium and carbonate of lime—have no such property. Mr. Mayall's formulæ altogether seem to show a prediliction for *mixtures*.

An old friend of mine, the late J. T. Cooper, who used to make use of anhydrous alcohol in chemical analyses, once gave me the following directions as a good practical method of preparing it:—

"Procure some lime fresh from the kiln, and sprinkle enough water on it to make it fall into powder. Fill a covered crucible with the powder, and submit it to a red heat. Transfer this powder, when cold, into a bottle containing strong spirit of wine, and shake it frequently for several days. Then immerse the bottle in a water bath, connect the neck of it with a condensing worm, and draw off the alcohol, setting aside the first half as *absolute*."

The object of slacking the lime was to get it in fine powder; the subsequent heating being sufficient to drive off the water but not to agglutinate the particles into a hard lump.

My friend used a carboy, and operated on two gallons at a time.

Yours very truly, GEO. JACKSON.

EXCELSIOR! EXCELSIOR!!

To the EDITOR.

SIR,—The trumpet of the great Goliath of the Fothergill process has again been sounded through the medium of your pages, but its sound is weak and shrill, rather resembling that blown from a "penny whistle:" its discordant notes jarring with the general harmony.

Now, Sir, at the risk of bringing down obloquy and contempt upon my head, for presuming to give an opinion upon a subject which would seem to be the exclusive right of one only, I maintain that I have a claim to do so for the following reasons, viz.—Because I consider it a subject in which every photographer is interested; because I am an ardent lover of the art, and have made dry processes my study for the last three years; because I think that a good dry process is essential to the future progress of the art; because there seems at present a number of conflicting opinions respecting this process; and because I am an amateur, and am not making this an advertising medium, not being interested in the sale of a "special collodion" or varnish, or other photographic material.

I admire the frank and disinterested manner in which many of our distinguished photographers give the results of their experience to the public; yea, even printed pamphlets of instructions, gratis;—what generosity! what beneficence!! although I for one have always been too modest to accept favours of this description.

But to return to the process "*which gives results equal to any wet, and superior to all other dry processes;*" would that I could endorse the sentiment. It is not my object to prove that as good results cannot be obtained by this as by any other dry process. The collodio-albumen and Fothergill's being the only two in which I have had experience, I have practised the latter in its various modifications since its discovery, and after many alternate successes and failures, I have arrived at this conclusion:—

That it is very much less sensitive than collodio-albumen.

That nothing like absolute certainty can be depended on.

That the path to success and to disappointment being so nearly alike, it is impossible to say upon which we have been treading until we meet the ghastly image of failure face to face, by the dim light of the operating room.

Since the season for out-door operations commenced, I have practised the process very extensively, principally in copying. My lens is a "Ross's Petzval," for plates 10 by 8, focus $13\frac{1}{2}$ inches, and I use a $\frac{3}{4}$-inch stop. I never think of giving less exposure than sixteen to twenty minutes, and even thirty minutes, if the light is not very good. My failings have been principally from *under* exposure. I have used various samples of collodion, but with no improvement as to sensitiveness. However this may differ from the published statements of some of its votaries, such is the process as I work it; but here I may be met with the question—Do I use the "*collodion specially prepared and peculiarly adapted for this process?*" "*That pronounced by the most eminent photographers more sensitive than, and superior to all others.*" Let me also be asked—Do I take Holloway's pills? and the same answer will do for both, and for the same reasons—I may say that I have seen it used, with very poor results. Probably my want of success may be from not having obtained the pamphlet; but I rather incline to Mr. Lloyd's mode of manipulating, which does not require a volume of printed instructions to work it. I have no doubt but Mr. Lloyd can appreciate the favour he has received in being allowed the credit for *publishing*. The discovery it appears was made long before he (Mr. L.) thought of it. What presumption not to have waited till it had been published officially, for then we might have had also *a special albumen,* superior to all others for flushing purposes!

The object I have in writing this letter will be attained if, when we are next favoured with any remarks upon the process which is to eclipse every other, this may be added as a testimonial from Yorkshire, in addition to those from Cheshire and Gloucestershire. If desired I have no doubt but I could procure several others in this town, and would humbly suggest that the following recognised form should be used:—"Sir,—Having heard of your far-famed collodion for the Fothergill process, and the rage it was causing in the country, I caught the epidemic, and determined to obtain a quantity, and am happy to say I was cured with one bottle!"

I am, yours, &c. J. H.

Bradford, June 7, 1859.

[In the preceding communication our correspondent makes an indirect charge against us personally, viz.—that of permitting our columns to be used unfairly as the medium for advertising. This, to the best of our knowledge and belief, we have never done. We have allowed full latitude to all for discussion of matters of interest; even personalties when directed against ourself we have permitted to appear, but against others we cannot allow them to pass without remonstrance.

Mr. Keene as a *photographer* has a right to be allowed to express his opinions, even supposing them to be biassed by self-interest: he attaches his name to his communications; our readers can place their own estimate upon these opinions, and we are always ready to admit fair rejoinders—witness the present letter. As a *dealer in collodion* Mr. Keene *advertises legitimately* in all or many of the publications devoted to the literature of photography. Now, has our friend J. H. in the above letter treated Mr. Keene quite fairly by mixing up statements made in the latter's *communication* with those in his advertisements?

We have used Mr. Keene's collodion, and found it good, as also that of many other makers, including Horne & Thornthwaite's, Ponting's, Thomas's, Hardwich's, &c., &c., and although all have their special qualities, we have been able to produce good results by the Fothergill process *with the whole of them.* We do *not* work, however, according to the directions given by Mr. Keene, nor anybody else exactly, but incline rather, like J. H., towards Mr. Lloyd's method of manipulating. We may remark, *en passant*, that when we wish to try any particular collodion, we as a rule purchase it without the maker's knowing anything about it. We do not approve of the sneers against printed pamphlets of instructions *gratis*, given by dealers in photographic chemicals. There is no *false pretence* about the matter at all: the object is a commercial one, and is recognised as such. Many of these little *brochures* do contain useful hints and instructions, and, when they do so, we never hesitate to notice them favourably; any more than we hesitate to condemn and expose false assumptions, when we detect them.

We are obliged to J. H. for the statement of his experience and opinions:—such are highly useful. We trust, however, that he will be more forbearing in future, and not unnecessarily impute bad motives where errors of judgment are probably the only faults.—ED.]

THE PATENT OUTRAGE.

To the EDITOR.

SIR,—I received, to-day, the *Journal of the Photographic Society*, and, after reading the leader, on turning over, I came to "Specification of patent granted to Oliver Sarony, of Scarborough," &c. Now, what do you say to it? Will that patentee stop me from doing what I think fit with my negatives, and what *I*, perhaps, have invented, or at least carried out, and as the catalogue of our exhibition will prove, was the first who exhibited positives composed from several negatives. I think the first were in 1854, or certainly 1855. Besides, you recollect my paper, read some time ago; and I can *show*, that years ago, I transferred a good head on to a bad body; so also a good body with a bad head (portrait of an unruly child). Of course he must have paid for his patent, and it serves him right. That is one punishment.

I am, yours, &c. O. G. REJLANDER.

[For our opinion upon this matter we refer to a more prominent place in the current number.—ED.]

ANSWERS TO CORRESPONDENTS.

MARY ANNE.—Many ladies are photographers, and good ones too. Commence with a stereoscopic camera. We advise you, however, to beg, borrow, or purchase a good negative, and learn to print well first of all. It is a capital plan to get your hand in, and assists you in the principles of photography far more than most people fancy.

WALLIS.—The greasy appearance of your plate is due to the ether and alcohol not having been entirely displaced from the collodion. You must leave it a longer time in the bath; about three or four minutes is generally enough, but if not, give more. Should it appear greasy on taking it out, put it back again for another minute or so, and continue thus until it comes out quite free from the fault.

WALTER PURDAY.—We cannot publish an opinion upon the relative value of lenses made by the various opticians; even if it were possible to form a just opinion, it would not be fair to do so; but we have several times indicated the way to test lenses. All makers who can produce very high class objectives must have some better and some worse than others. It is absolutely impossible to get all equally good, unless some be brought down in quality.

GOLD TONING.—Dissolve your gold in aqua-regia, as you propose; the silver and copper must be removed, or they would act injuriously. To effect this, add solution of *common washing soda* (carbonate of soda), until all effervescence ceases, and litmus paper is no longer reddened, when a green cloudy precipitate of carbonate of copper will be formed. This takes some hours to settle: pour off the *clear* gold solution, and filter the remainder. A solution of double chloride of gold and sodium remains, which, however, requires the addition of a single drop of hydrochloric acid to prevent the precipitation of metallic gold. It is then fit for use.

J. M. M. (Moffat).—We will reply more at length in our next; we have not room in the present number. Your pictures appear a little under exposed, and under developed also, but the fault you complain of is not due to these causes, though a little aggravated thereby. Old collodion that has lost much of its ether by frequent use is very apt to produce the fault you describe: remedy, add a little ether. New collodion, with cadmium iodiser, especially if more than usually charged with alcohol, is liable to the same: remedy, add a few drops of chloroform, say ten, to each ounce of collodion, and shake up well, till the pyroxyline, which is precipitated, is redissolved. Let your film set well before immersion in the nitrate bath.

RECEIVED.—"W. Ackland," "C. J. Burnett," "F. J. Cox."

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THE PHOTOGRAPHIC JOURNAL.

No. 97, Vol. VI.—JULY 1, 1859.

The property inherent in films containing albumen, when associated with certain salts of silver, of retaining, permanently, the actinic force communicated by exposure to light, so as to admit of the development of an image even after the removal of the sensitive coating—a property first brought under the notice of photographers by Mr. Young, of Manchester—is one that has naturally fixed the attention of many of the scientific section amongst our brethren. It is not at all surprising that a very considerable difference of opinion appears to exist relative to the explanation of the phenomenon, and we are induced to advert to the subject because a gentleman of note amongst the photographic community—one who is deservedly regarded as an authority in the chemical department especially—has put forth an opinion that appears to us impossible to establish as founded upon a correct hypothesis.

The gentleman to whom we allude is M. Davanne, a careful investigator and an earnest photographer.

The opinion to which we take exception is, that the action of the light reduces to a metallic form a very minute portion of the silver compound, which is not removed by the hyposulphite of soda subsequently applied, and which serves as a nucleus, about which the visible image is afterwards deposited from a solution of nitrate of silver supplied for the purpose.

We are not about to advocate the theory of the sub-iodide, also put forth on the other side, by way of explanation, because we think there is evidence to show that *both* theories are erroneous.

We have very carefully examined, under the microscope, films of the nature above mentioned, that have been affected in certain parts by actinic influence so as to become impressed with a developable image, but without being able to detect even the smallest amount of difference between the impressed and unimpressed portion of it. For this purpose we have employed a microscope of the highest class, and powers varying from fifty to one thousand diameters. Moreover, we have illuminated the objects with ordinary and also with polarised light, and to show that our manipulation is not likely to be in fault, we may mention that we have been familiarly acquainted with microscopical science for something like a quarter of a century.

Metallic silver is a solid opaque substance, it is totally unknown in a transparent condition, and the assertion that it can be deposited in particles so minute as to escape detection by the microscope, when properly applied, appears to us to rest upon *pure assumption*, without the possibility of proof in the present state of our knowledge. But this is not all, for while we have no experience that should lead us to accept such an assumption as founded even upon probability, the experience we possess would lead us to a diametrically opposite conclusion. The actual measureable space appreciable by a microscope like the one we employed is so excessively minute, that, if we name it, the probability is that the general reader would either disbelieve or not comprehend it; nevertheless, we will give an instance, by way of example, of an actually ascertained fact. The siliceous cuticle of a minute vegetable organism, known as the pleurosigma macrum, is adorned with numerous transverse and longitudinal striæ, the transverse ones being at the distance of the eighty-five thousandth part of an inch from one another. As compared with this, the most minute and impalpable powder grains are awkward lumps.

We are thoroughly convinced that silver, in a metallic state, because of its opacity, could not escape microscopic detection, and, for a similar reason, that a sub-iodide would also be perceptible, as if transparent or semi-transparent, its refractive power differing from that of the atmosphere would, by certain manipulations known to skilled microscopists, readily be made available to demonstrate its presence.

About a couple of years back, while presiding at a meeting of the Microscopical Society, the best method of producing a convenient Finder being under discussion, a suggestion was made by Mr. Maltwood that microscopists should avail themselves of the aid of photography for the purpose; not merely a crude suggestion, but backed up by the actual production of a specimen. We at once perceived the practicability of the plan, and though there were some minor points of detail to be worked out so as to ensure uniformity of construction, these were simply matters of mechanical skill.

Messrs. Smith & Beck, the eminent microscope makers, have now brought the articles in question into the market, and, as there are some points about the apparatus, of interest to photographers who are not microscopists, we shall, probably in our next, give a description of it and explanation of its use.

It will be seen from a letter from Mr. Spencer, published amongst our correspondence, that, relative to the presence of oxalic acid in some samples of collodion, the conjecture of Mr. Hardwich is probably the right one, as it does not appear that the compound is found unless the collodion "bottoms" are from such as has been "iodised." This accords very closely with experiments made previously in a similar direction by Mr. Hadow, who produced, under analagous conditions, oxalate and saccharate of potash in considerable quantities.

Crystal Palace Art Union.—Among the photographic works which subscribers of one guinea will be enabled to select are—a view of the Miner's Bridge, North Wales, 18 × 14 inches; five views of the Crystal Palace, 10 × 8 inches; nine views of the Fine Art Courts of the Crystal Palace, 10 × 8 inches; a series of twenty stereoscopic views of the Crystal Palace and Park, a series of twenty stereoscopic views of the most attractive features of the Crystal Palace, and one copy of a series of large photographic views of the interior and exterior of the Crystal Palace, 24 × 18 inches. Subscribers of three guineas have the option of selecting a photograph of the interior of the Crystal Palace, 54 × 24 inches.

Photography in the Picture Galleries.—Some time since very fine photographic copies of the Cartoons at Hampton Court were made, and have been exhibited at various places, to the gratification of admiring connoisseurs. The Marquis of Hertford is following the example thus set, and is having photographs made of his noble collection of pictures. It is to be hoped the other large collectors throughout the country will pursue a similar course, and, by bringing the gems of art which adorn the galleries of our land within the reach of those who cannot make the pilgrimage of those artistic shrines, elevate the taste and refine the feelings of the masses of our population.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

The man who produces a pleasing picture, accessible to many admirers, is a general benefactor, and deserves, at the least, a kindly thought from all who participate in the fruit of his brain.

There is perhaps no one subject upon which more difference of opinion exists than the definition of what constitutes Art in its widest and most elevated sense, and this in some measure accounts for the assertion so frequently made, that true art is not appreciated by the many. Is it not more than probable that such a statement is due rather to the erroneous definition of art by its would-be expounders than to any real foundation in fact? It is contended by some that no one can understand art-productions who has not undergone a course of training for the purpose, and that consequently for one unlearned in the world of painting to pronounce an authoritative opinion upon a picture is sheer presumption.

As in many other matters there is here some truth mixed up with a considerable amount of error. Like all other gifts a keen perception of the beautiful can be cultivated to an extent undreamt of by some, although it *is* a gift after all, and there is no means of communicating it where it is not already existent; but the power of conceiving beauty, and then of giving expression to it, is a very different thing from, and far more rare than, the mere apprehension of beauty.

Art and beauty are more or less interchangable terms, for beauty consists, not solely in form, or colour, or number, or expression, or sentiment, but in a happy combination of all or some of these elements. And what is this but Art? We take it then that true art is a thing rather to be *felt* than understood, and though he who *understands* must of necessity feel it, many may feel, and feel deeply too, who do not, in the common acceptation of the term, understand.

That which is beautiful in the abstract must excite some pleasing emotion of the mind; and though the introduction of excitants of unpleasing ideas may be quite legitimate, such is only the case when they serve to heighten the effect of others which elevate and refine the mind, just as in music the sweetness of concords is enhanced by the judicious use of contrasting discords.

If then a work of pictorial art be truly meritorious, we contend that as a rule it can be *felt* and *appreciated* by the many, more especially and in a higher degree when attention is drawn to the various points of excellence by those whose perceptive faculties for the beautiful have been cultivated; but, and here is the test, if the points indicated be not readily admitted as excellent by most men, then in all probability the critic has set up for himself a false standard that does not conduce to a true verdict.

We do not mean to assert that what is generally admired must of necessity be good or beautiful: ideas on this head are apt to be governed much by comparison; but when defects are pointed out, they can generally be readily enough perceived, and so also with beauties. Not many men are discoverers, but most men can perceive if shown to them what has been discovered by others.

We had no intention, when commencing this article, of being led away into so long a digression; we were about to express our approbation and admiration of a recent production of Mr. O. G. Rejlander's that we *feel* to be truly beautiful — and yet the subject is nothing but an old man, and poor as well as old. Moreover, he is performing an act that we have heard painters say never can be made a graceful one, that of satisfying the cravings of hunger.

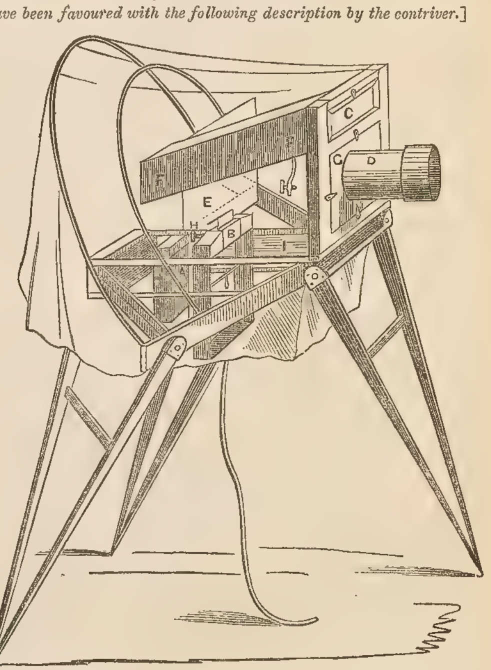
The title of the picture, for a picture it is in the best acceptation of the word, is *The Wayfarer*. An old agricultural labourer, clad in the homely smock frock and gaiters, is seated on a bank by the wayside; beside him are his bundle, with his stick thrust through the knot of the old handkerchief, which ties up his pack, and his hat cast aside to allow the gentle summer breeze to cool his heated brow. In his right hand is an open clasp knife, with which he has cut the morsel that he is in the act of placing between his lips from a lump of bread and cheese held in his left hand, resting on his knee, with the piece of old newspaper in which it had been previously wrapped. Nothing can well be more commonplace than is indicated by the foregoing description; in what then can its charm consist? Not only that the figure is well posed, the photograph well executed, with a total absence of conventionality, and the whole truthful to nature, but the *sentiment expressed is one of gratification* — rest to the weary, refreshment, repose. The attitude is natural and by no means devoid of a certain kind of grace; the composition harmonious, the masses of light and shade well balanced, the background in perfect keeping with the figure, yet unobstrusive, as it should be; and although there is all the beauty of detail for which photographs are unsurpassable, breadth of effect is not in any way sacrificed.

Every wrinkle in the face of the old man is perceptible, every vein and sinew of the hands, every fold, nay almost every thread of the well-worn garments can be made out, and even the very texture of the materials of which the latter are made; yet for all that there is nothing of the pre-Raphaelite cast about the composition. Mr. Rejlander is a thorough *artist* as well as a skilful photographer, and though all of his works bear the impress of thought, and are evidently executed with a settled purpose, in that now before us he has been pre-eminently successful. There is no "sham" about it at all. It is an every-day subject truthfully depicted, but not in an every-day manner. Mr. Rejlander is in fact a Rembrandt amongst photographers; and such productions as the one we have been endeavouring but poorly to describe we cannot but regard as we have already designated — True Contributions to Art.

PHOTOGRAPHIC CAMERA AND DARK TENT COMBINED.

By Wm. Moginie.

[*We have been favoured with the following description by the contriver.*]



The above apparatus is constructed with a view of enabling photographers to work the wet collodion process in the open air and away from home, without requiring a darkened room, and without allowing the plates to become dry between the times of coating, exposure in the camera, and development.

It differs from the usual apparatus employed for the purpose, inasmuch as the whole of the process is conducted in *one* enclosed space, instead of using a camera and a tent, thus reducing the bulk of a travelling apparatus at least one-half, and dispensing altogether with one tripod-stand.*

When erected it measures two feet six inches in height, two feet ten inches in width, and one foot ten inches in length.

Sufficient light is admitted to allow the operator to coat a plate, place it in the silver bath A, expose it to the action of the lens, and develop the picture without any intervening medium between himself and the plate on which he is at work—the light being shut off *only* at the window C, during the time of exposing the plate.

Pictures can be taken with combination, single, or stereoscopic lenses of any range of focus, from three inches to sixteen inches, by altering the position of the frame B, in the open space I.

The lens D, can be placed in four different positions by means of a moving front G; but it remains stationary while focussing an object, the plate-holder B, itself having the necessary adjustments attached to it. A coarse adjustment, to be used according to the focus of the lens and the distance of the object from the apparatus, and a fine adjustment H (which takes the place of the ordinary rack and pinion of a lens), is used to secure the surface of the plate being always in perfect focus; both are worked from the inside of the apparatus with the greatest ease and certainty, focussing more correctly than with ordinary ground-glass contained in the usual frames.

The plate can be placed in any desired position by a movement answering the purpose of an inclining back, and capable of being used in seven different directions, namely, above and below the lens, even with it, forward, backward, to the right, and to the left. Frames and shutters are not required, thus avoiding many difficulties often experienced by photographers, such for instance as finding the plates too large or too small for the inner carriers; or, as is frequently the case, a shutter becoming so fixed that it cannot be raised.

This apparatus will produce a picture on a plate of any size that can be admitted into the bath, and need not necessarily be square. Dippers also are done away with: the plates are cut half an inch longer than the depth of the bath, which admits of their being placed at once in the nitrate of silver solution when coated with collodion; and the picture having been taken on the lower portion of the plate (inverted when exposed), the extra piece of glass can be broken off and the plate transferred to the plate box, a cut having been *previously* made with a diamond, to allow of its thus being reduced to the usual size; therefore, the whole process can, with moderate care, be carried out from beginning to end without the chemicals once touching the fingers, a great boon to those who wish to keep their hands free from stains, cyanide, &c.

A supply of water is contained in the cistern F, sufficient to effectually wash a dozen plates, and it is provided with a flexible tube and small tap.

The focussing-glass E, is firmly held in its place by a strong spring and it is moved horizontally with the upper portion of the frame B, by means of the fine screw H. The prepared plate occupying exactly the same position when the ground-glass is removed, must of necessity be in perfect focus.

Not the least recommendation in its favour is its portability, the whole, when packed in its case, measuring only thirteen inches in length, by four and a-half inches in width, and eight inches in depth. The chemicals, lens, bath, plates, and a supply of water are placed in another case about the same size; both are provided with straps, and may be carried, one in each hand, with the greatest ease for a considerable distance. The stand, which is exceedingly firm, is a folding one, and is carried at the back like a quiver for arrows, with a strap over the shoulder; it is twenty-five inches long and six inches wide, by one and a-half inches.

The whole is peculiarly adapted for tourists' use, especially while travelling on the continent, where weight and bulk are great obstacles in the path of English photographers. The case containing the apparatus weighs, when complete, eight lbs.; the second case, containing the lens, chemicals, bath, and plates, &c., eight lbs.; and the stand and etceteras make the total twenty-four lbs. Pictures have been taken with it equal to those taken with ordinary cameras, and with these advantages:—The plate is coated, excited, exposed, developed, washed, and fixed in any part of the country where the apparatus can be set up.

By some further modification, the total weight can be reduced to twenty lbs., an alteration intended to be carried out.

* It is therefore dependent upon the same principle as that adopted by the late F. Scott Archer, who used his camera as his tent, Mr. Moginie employing his tent as a camera.—Ed.

SILVER PRINTING PROCESSES.

Including Salting, Sensitising, Toning, Fixing, and Testing Baths.

By C. J. Burnett.

(Continued from page 107.)

In the papers now described, in which silver oxide is precipitated and retained in an insoluble or approximately insoluble form by the tartaric, oxalic, succinic, fumaric, citric, or other oxygen acid, it is perfectly possible, without destroying the paper and perhaps even with benefit to its keeping after sensitising, to wash out the free nitrate and the soluble products of decomposition. In this case, however, the proportion of organic salt should perhaps be increased, and a weaker silver bath (say 20—30 grs. to the oz.), in order to diminish loss of silver, employed; or we might make the first washing out be with water containing a little of the vegetable salt, so as to precipitate on the paper the silver contained in the adhering silver nitrate, instead of washing it away. This will be further recurred to in my promised formulæ for negative processes on paper, albumen, and collodions, containing the vegetable and other insoluble salts of silver-oxide.

C.

The Washing immediately before Toning.

I find a solution of common salt much recommended and used. As, however, I have often, in my experiments, found this to have a tendency to produce redness, I have (except where this redness is wished for in order to *balance against* the blueness of a very thorough gold toning or *protection*) recommended plain water, or first plain water and then an exceedingly weak ammonia water; or, if something farther is wished, a trial of a little tartrate, or oxalate, or carbonate of potash in the water. I also have made some experiments in the addition of common salt to the alkaline bath to be described.

D.

Toning Bath with Gold Salts.

Convinced from the first of the error involved in the addition of hydrochloric acid to our ordinary gold bath, and that the move ought rather to be in the opposite direction, it is now* about two years since I recommended to my friends here the use of an alkaline gold bath; the ground of my recommendation being, that the salt of gold commonly employed is a *ter*chloride, containing, as its name implies, three atoms of chlorine to one of gold, and that, consequently, in using a bath of it (chloride of silver consisting of *equal* atoms of silver and chlorine), for every atom of gold deposited on the print three atoms of silver are lost to the print by being converted into chloride, necessitating thereby a large amount of over-printing and waste much better avoided, and the evil being of course still further increased if we add acid; while by calling in the aid of an alkali or its carbonate (present in the bath either as carbonate or partly in the state of an alkaline aurate, or in combination with auric oxide acting as an acid), we remove or diminish greatly this waste, and enable the exchange of the two metals to be conducted on something like terms of fair reciprocity. For my statement of its existing in this form I have, I believe, good chemical authority to back me.

The alkali which I have chiefly recommended here has been common washing soda, as the most accessible, or the bicarbonate. Ammonia having the material disadvantage, except where a *very* large excess of acid or chloride of ammonia is present, of being apt to precipitate most of the gold, I have not recommended it, except (and for trial only) to those who will insist on working with a gold salt prepared with muriate of ammonia and nitric acid, or nitrate of ammonia and muriatic acid.†

As to the quantity of alkali to be employed, what I have recommended has been—first, to make a *strong* ordinary plain terchloride of gold bath, and then, having also made a saturated solution of common soda, to add to the gold bath, stirring all the while, first as much of the soda solution as was necessary to make it turn red litmus paper to a blue, and use the bath for toning thus, or as nearly as possible neutral, or else—say as much more of it again, or yet more, especially if intended for toning albumenised papers to

* I have no wish to raise any doubt as to what I see stated as to Mr. Waterhouse having independently made use of an alkaline bath; and I am even perfectly willing to admit his priority, if he employed it or recommended it before the summer or spring of 1857. As to the addition of the citrate to the gold bath, that we owe entirely to that accomplished chemist Mr. Hardwich; for though I tried and recommended some of the vegetable salts in platinum and palladium baths, my recommendation of vegetable salts (in spite of some trials of the formiates, &c., as additions to Sir J. Herschel's ferric, and in my own analogous, uranic, chrysotypes and palladeotypes), did not extend to the gold salts.

† Instead of with the pure terchloride, or, if they must have a double salt, with one prepared by dissolving the gold in a mixture of nitric acid with either common salt or bromide of potassium.

increase the penetrative power:—the quantity of the soda solution being easily estimated if we pour it out of a common graduated fluid measure without any weighing.*

Platinum Toning-Baths.

To the use of the bichloride of platinum, there would appear to be constitutionally the following objections (some of them more or less extending to other platinic salts):—

1. The same difficulty alluded to in the case of the gold-terchloride as to relative proportions, not so great an extent, atomically, from the platinum salts being only a *bi*chloride, or containing only two atoms of chlorine to one of metal; but augmented again, in another way, to an extent possibly more than enough to overbalance this constitutional difference, by the fact of the atomic weight of platinum being less (not more) than that of silver and only one-half of that of gold; while the difference of specific gravity will tell still further in the same direction, by diminishing the *space* occupied by, and consequently the pictorial value of, each atom of platinum deposited.

2. That the platinum in the bichloride (or chloroplatinic acid) has a much greater affinity for, and is consequently much less easily reduced from its combination with, the chlorine than is the gold in the terchloride of gold.

3. The great tendency of the bichloride of platinum (or chloroplatinic acid—a far more stable and more powerful acid than the auro-chloric) to form an insoluble double salt, containing both silver and platinum. This conduces apparently both to the weakening of the picture and to loss of platinum, by its deposition as an insoluble yellow salt, in combination with the silver in the lights.

4. The tendency to form an insoluble double salt with potassium, &c., pointing out the chloride of potassium as the *least* suitable, and that of sodium as the most suitable chloride for the salting of papers intended for platinum-toning. There is however in our toning with platinum, or with any other metal, another and most important consideration which must not be overlooked. This is the relative amount of light or of darkness which is reflected by equal bulks or surfaces of the different metals (or of their oxides or other compounds, as deposited on our picture). The probable inequality in the pictorial value of even equal bulks or surfaces, renders the chemical deductions insufficient guides, and leaves the whole question of the relative advantages of the different toning-metals (or even of different salts or differently made baths of the same metal), both considered as to the amount to which the picture is likely to be weakened or strengthened by each of them, and as to the pecuniary expense of each of them, a question on which practical experience, and a thorough trial of each, must give the decision.

I give a few formulæ for platinum toning-baths.

No. 1.

Using the common bichloride, add to it, as to the terchloride of gold, a solution of soda, or carbonate of soda, and use it thus, or rather with the farther addition of tartarate, acetate, or formiate of soda (or one of their acids), exact quantity immaterial; or we may add the vegetable salt first, and the carbonate of soda afterwards, heating, if we please, to promote formation of platin*ous* oxide. Precipitate of an insoluble platinate is sometimes troublesome here. Would potash answer better?

As to the strength of the bath, every one must please himself. Suppose a much larger quantity of platinum than of gold necessary, bichloride of platinum costs only 24s. or less per ounce.

No. 2.

A bath containing pure platinic sulphate or nitrate,—these salts having the advantage over the bichloride of having equal atoms of acid and base.

The formiate, tartarate, and acetate, &c., of platinum have advantages over these in ready reducibility; but the same cause interfering with their long preservation, the best mode of employing them is—

No. 3.

Make your bath with a solution of platinic sulphate† or nitrate, and then add to it a solution of tartarate, formiate, or acetate of soda or other deoxidiser, and use the bath either without, or after, a heating, which tends to reduce the platinic to a platinous or less stable oxide. A bath of the vegetable salt of platinum might of course be prepared directly by a solution of the oxide in the formic, acetic, or other acid.

Nos. 4, 5.

Similar baths to Nos. 2 and 3, but with No. 4, platin*ous sulphate* or nitrate, or No. 5, platinous tartarate, formiate, acetate, oxalate, or citrate, substituted for the corresponding platin*ic* salts. The platinous salts are more easily reduced than the platinic, and are preparable also directly by solution of platinous oxide in the respective acids. I have more and important particulars respecting the platinous salts for another paper.

Besides the salts now recommended in these formulæ, I may name the ethylochloride of platinum alone, or with soda or potash, and the fluoplatinate of potassium. Also, (proto) chloride of platinum, or dissolved in soda or potash solutions.

I have not yet got the *pure separate* platinates and aurates tried, but they do deserve trial as toners, the metal being easily reduced from them by many deoxidisers. I have also tried salts of palladium, iridium, and rhodium, in toning-baths, but without apparently any distinctly valuable results.

(To be continued.)

* We fear a bath prepared thus would be very apt to form a precipitate of reduced gold, if kept for any time.—Ed.

† Platinic sulphate is not at present a regular article of commerce. It may be made by heating the bichloride with sulphuric acid; but for the ordinary photographer, no great chemist, nor possessed of much variety of chemical appliances, and with the materials commonly accessible, the following is the best formula:—Dissolve say ¼ oz. of bichloride of platinum (value 6s.), in ½ oz. of water, add to it a saturated solution of potash as long as a precipitate is produced, when this ceases let it subside thoroughly, and pour off the liquid which is sulphate of platinic oxide, and will keep good for any time.

N.B.—The precipitate contains about two-thirds of the platinum, and must be kept for its after extraction, which is quite easy. The acetate, tartarate, formiate, and oxalate may be made directly in precisely the same way, but dont keep so well, so that it is better to use the sulphate, with vegetable salts added.

PHOTOGRAPHY AT THE HANDEL FESTIVAL.

The recent Festival has proved a wonderful success — musically, financially, and pictorially. The photographic art was well represented by Messrs. Negretti and Zambra, photographers to the Crystal Palace Company. While the representatives of the "fourth estate" were actively employed in making their "pen-and-ink sketches" of the beautiful prospect which met their gaze, and recording the vivid impressions made by the orchestral marvels which greeted their ear, *our* art representatives were busy in the production of wondrous pictures which, in a few moments, conveyed to those present, and subsequently to a distant public, truthful representations of the picturesque scenes which met the eye of the visitor to the Crystal Palace during each day of the great Handel Festival.

The orchestra was photographed on the day of the rehearsal, and it was printed, mounted, and posted on the orchestra before the commencement of the second part of the concert. The orchestra was again taken on Wednesday; and on Friday, owing to the different arrangement of the ladies, which gave the orchestra a prettier appearance, it was once more photographed. With reference to the success as a photograph, we may, without fear of contradiction, state that, taking into consideration the oiled waterproof yellow awning over the orchestra, it is a wonderful picture, containing, as it does, some three thousand distinct portraits. Besides the orchestra, there were a number of negatives taken on each day of the festival of all the persons occupying the centre transept: so that we have a collection of some 20,000 portraits. We fear, however, these pictures may cause some mischief; for some gentleman who had *very* important business in London may, perhaps, be seen seated very cosily with some fair one that may make his absent partner not at all pleased with the gentleman's trip to London.

On Friday a stereoscopic picture of the Royal Box was taken, printed, mounted, and presented by Mr. Negretti to H.R.H. the Prince Consort previous to the commencement of the second part. When it is considered that the box was constructed, as usual, with the everlasting covering of red cloth; that H.R.H., as a lover of music, cannot refrain from beating time; and that there was an awning all over the transept — this picture was eminently successful; again, when we consider that the usual time of exposure under ordinary circumstances in the palace is about ten times more than that of any ordinary glass room — a quarter of an hour, and from that to twenty minutes, being the time given for a 10 × 8 picture — we are only surprised that the artists were able to get anything at all. The length of time quoted may surprise some; but when it is recollected that the roof is 150 feet over the sitter's head, and that it is glazed with that peculiar green tinted glass which in the process of time is changed into all manner of colours, then the surprise ceases.

The size of the pictures taken is 18 × 10. By arrangement with the company, the price of each picture to the members of the late orchestra is 5s.; to the general public 7s. 6d. We need hardly add they are published by the artists, Messrs. Negretti and Zambra, of Hatton Garden, and of the Crystal Palace.

INSTANTANEOUS PHOTOGRAPHY.

(From Our Reporter.)

Mr. Skaife delivered a morning lecture in Mr. Hogarth's Picture Gallery, in the Haymarket, to a highly select audience, on Wednesday, the 8th ultimo, which afforded instruction, not only to the photographer, but also to the naturalist, the physician, the soldier, the sailor, the traveller, and the theologian.

The photographer was shown that the mechanical action of light on a photograph was identical with the harder effect produced upon a field of snow by trampling upon it. The physician was put on the track of internal disease by the breathing upon a film of collodion. The theologian was awakened by a startling heliographic revelation, and then the lecturer introduced to the meteorologist a new atmospheric phenomenon, discovered in the spray from the paddle-wheel of a Woolwich steamer, a small photograph of which, enclosed between two concave glasses, was handed round for the inspection of the *savants*, whilst the little instrument, called a *pistol camera*, with which the curious photograph was taken, was duly explained. And after touching upon the causes that led to photography on concave glasses, and the reason of their final abandonment, Mr. Skaife called the attention of his auditory to two enlarged views of the nomination of candidates, taken by his pupil with the pistol camera from on horseback. In order to convey an idea to the audience how this was done, the pupil was directed to snap his camera at the skylight where the figure of a man was perceived standing on the roof, which he did, and in less than one minute afterwards the resulting picture of the window with the man behind it was handed round to the astonished audience. At the conclusion of the lecture, the auditors eagerly availed themselves of the permission granted to examine the miniature apparatus that realised such extraordinary results, which, exclusive of the camera, consisted of a pneumatic Mackintosh developing box, so arranged that a rapid succession of instantaneous little photographs could be taken without the fingers of the photographer ever coming in contact with the chemicals. Lastly, it was demonstrated that one hundred of these little negatives could be taken at a cost for chemicals not exceeding one shilling.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

This Society held its second meeting, on the 9th ultimo, in the large room adjoining the Walworth Lecture Hall, Mr. A. H. Wall in the chair.

Previous to commencing the evening's business the Chairman observed, that as that business was the important one of confirming rules and electing officers, and as doubtless many other gentlemen would join the meeting in the course of the next half hour, whose presence upon this occasion would be most desirable, he proposed the postponement of the more serious duties, and suggested that the gentlemen present should pass some little time in examining the objects of interest provided by the kindness of some of the members.

Some excellent stereographs, obtained by Fothergill's process and taken by Mr. F. Howard, were much admired for perfection of half tone, force of effect, and beauty of colour — one, a view of the Crystal Palace, gave some distant foliage with all the softness of aërial perspective, combined with wondrous perfection of detail. Some discussion arose respecting the most effective position for the horizontal line, both with reference to the picturesque and the stereoscopic results.

Mr. W. Ackland exhibited a new camera stand for landscape photography, very light, portable, and, when fixed, extremely firm. This gentleman also announced that he was upon the eve of an experiment of a singularly interesting description, of the success of which he had little or no doubt, and which he hoped to lay before the members on his return from the continent.

Mr. Leake put up, with extreme ease and speed, a portable tent of his own invention, which he described from personal experience as standing well against wind, and thoroughly answering the purposes of out-door photography, stating that during the last year he took at least one hundred 12 × 10 views in one similarly constructed. This tent consisted, first of a shallow box or tray, about thirty inches in length, eighteen in width, and two in depth, made of half-inch pine deal, strengthened by wooden blocks at the angles, and forming the table or bottom of the tent; secured to this was a gutta percha tray with a pipe attached, which, by acting as a sink, keeps the bottom of the tent always dry and clean. The lid of this tray formed the top of the tent. Round the inside of the bottom and outside edge of the top was secured the lining, forming three sides of the tent, and consisting of two thicknesses of black and one of yellow calico; sufficient light being admitted to work by, through the yellow, by a small square aperture in the black calico; light iron rods, about two feet five inches in length, supported the top when the tent was erected, and shut into the case when it was packed. Over the opening in front was suspended by hooks a curtain of the same description as the lining, large enough to wrap round the operator and exclude the most inquisitive of solar "prys." A small plate-box was placed in the tray, and packed with the lining, curtain, and rods, in the case. This tent was fastened on an ordinary tripod stand by a screw through its bottom; but Mr. Leake informed us that he had a very light portable stand for the purpose, and that this, with the tent, weighed fourteen pounds; that it could be made, with a fair margin of profit, for about a guinea, and carried very conveniently by the handle attached to its side. The tent exhibited was for pictures 12 × 10, but a smaller one was made for stereoscopic pictures.

No discussion ensued, inasmuch as the Chairman called attention to the business more particularly claiming attention.

The Chairman read the minutes of the previous meeting, and called attention to the steps which he, with the other members of the provisional committee, had taken for the formation of this Society. A set of rules being read ,were, with some few alterations, adopted. The meeting then proceeded to elect its officers for the present year, as follows: — *President*, the Rev. F. F. Statham; *Vice-President*, Mr. W. Ackland; *Treasurer*, Mr. F. Howard; *Honorary Secretary*, Mr. A. H. Wall; and the following gentlemen to form a Committee, viz. — Messrs. Cotton, Hannaford, Leake, Sen., Clarke, and Leake, Jun.

The Secretary then proceeded to receive the names of members, and announced that the number already given promised very favourably for the Society's future well-being.

As nothing formal characterised these proceedings (and business proceeded none the less smoothly for the same), a cordial warmth seemed to unite all present in a glow of social fellowship, which it is hoped may always exist to accelerate the progress of this infant society.

Exhibition.

THE EXHIBITION OF THE FRENCH PHOTOGRAPHIC SOCIETY.

(Continued from page 153.)

The first name on the catalogue is that of "The Sculptor Adam-Salomon," as he ostentatiously inscribes himself, and which, with his cognomen, admirably bespeaks the man. He exposes forty-two portraits, which are hung in the first court to the left on entering. Of M. Adam we were told to expect wonderful things; and it would have been better to have let imagination had her course, for the reality is disappointing. When I have said the poses are original I have said all I can in his favour; and yet, if I had a dear friend from whom I was parting, and wished to have a "striking likeness" of him, it is not to M. Adam I should take him. A sculptor having a hero, a great poet, or philosopher to immortalise, is expected to spiritualise — to idealise — his subject, because his work is to be handed down for public observation in after ages; but your friend is not to be put into a pose which is unnatural to him, and represents him as he is not. Here we have a repetition of little tables, columns, curtains, cords, tassels, and vases, pervading more or less all the frames — a style of portrait quite exploded in London. Generally the accessories and dress are the most studied and sharp in focus, while the human face divine is much out of focus, hazy, indistinct, too black on one side and too white on the other. Generally the portraits have a very dark appearance from improper development, though thickly varnished and much relieved by the broad gold frames. They appear to have been taken with four-inch lenses, and are mounted in cushioned shaped passe-partouts, of white cardboard. Perhaps No. 8 may be reckoned the best as to natural pose, light, sharpness, and development, though the hands are large and huge enough to be those of a "navvy."

Comte Aguado comes next on the catalogue. His specimens were at length found in the third court to the right, after we had had a trot all round the exhibition to discover them, thanks to the

bad arrangement of catalogue and numbering. He is a rich amateur, and has a good staff of assistants, and exhibits proofs printed from negatives on waxed-paper and wet collodion, which represent charming studies of trees effectively rendered. One of the most excellent stereographs I ever saw may be noticed; it shows a small rustic four-wheeled carriage, drawn by an ass along a road in the grounds of a chateau, and a white dog sitting on his hind legs holding the reins in his mouth, a groom walking at the opposite side of the spectator, who is pleased by the unstudied arrangement of the group, the marvellous sharpness of the whole, the equal illumination, the clearness of the proof and the depth of shades, so full of detail. It puts completely in the background the instantaneous views of Caldesi and Montecchi. Another feature to be chronicled is that this print is about double the size of the ordinary slide, and is viewed in a stereoscope of corresponding dimensions, which Monsieur Le Comte also contributes.

Viscomte Aguado displays also some of the novelties of the season. His views, taken at Montfermeil by the wet collodion and the Taupenot processes, have many inferiors. His series of *épreuves stéréoscopiques* are very amusing. There are views taken with the camera at a considerable altitude, and turned downwards nearly perpendicularly towards the ground, showing the human figure in various attitudes as seen directly under the eye, and producing new effects of "fore-shortening" or *raccourcissement*. I cannot speak so well of the reproduction of a lithograph after the famous picture by Winterhalter, of Her Majesty the Empress in the midst of her Ladies of Honour. The lithograph, when photographed, was probably badly lighted, and has a dullheavy aspect as if over exposed; nor is it very well printed, there is a white spot in the midst of it, no doubt occasioned by a bubble of air in the sensitising bath. The beautiful gold frame, *à chevalet*, surmounted by the imperial crown, is in good taste.

How is it Alinari Frères have not sent more than nine reproductions of designs by Raphael, from the galleries of Florence, Venice, and Vienna? What we do see whets the appetite for the remainder of their collection of this grand master, connoisseurs of whom, and whose names are legion, owe so much to photography for the faithful *fac-similes* it renders of breadth, shade, power, and the delicate and marvellous touch of his pencil. Of what incalculable value to the artist are these copies of the master's studies for his great pictures!

M. Asser, of Amsterdam, exhibits several proofs closely approaching the excellency of silver prints. They are by a new process, which he calls lithophotography. The stones from which the proofs are printed are placed side by side with them. The edges of the film which carries the subject has in some places left the stone, but on the whole there is much promise in his essays.

Baldus exhibits only one example of his skill, namely, the doorway of the library of the old Louvre. This is by no means one of his best, and shows unmistakably signs of photography under difficulties, although attempts have been made to touch out the thousand and one spots produced by dust, &c., in course of manipulation of the wet process. Why has he not exposed for the gratification of his admirers some of his effective views by his paper negatives?

Some of the views by Bernier, of Brest, are very meritorious. In two of them are the *forçats* at their work; their countenances are clearly defined, and show how man can be degraded by passion, depravity, and sin. These views must have been taken with very quick working lenses, for the attitudes of the groups of galley slaves are unstudied and of the moment. Thanks to the wet collodion, the pictures are clean, of good size, and are sharp to the edges.

Besson, a sharp tradesman, is not to be baffled out of his advertisement by the determination of the Society not to exhibit photographic apparatus, lenses, &c., which is highly to be regretted on behalf of amateurs as well as professional men, who are thus prevented from viewing, side by side, the improvements which are constantly being made by the various manufacturers, and thus giving facilities for the easy selection of the best. He forwards two views, which he entitles *Divers appareis de photographie d'apres nature*, representing a large camera for reproductions, a smaller camera for taking several views or portraits at one exposure, both from the designs of M. Bingham, and an assortment of rests, stands, pedestals, cleaning apparatus, and all the multitudinous appurtenances of photography.

Bilordeaux, who is perhaps the greatest manufacturer of photographic prints, exhibits some of his best efforts, though these are far from being up to the mark. Is not the production in great masses, the sending out into the market at a low price copies of engravings, &c., which, lacking proper material and care, will last but a very short time, a great evil? The duped purchaser, savage at his loss, throws the blame upon the body of photographers in general!

Bingham certainly ranks first in this exhibition in his particular branch—reproduction—for the excellency of his proofs, whether it be for their equal illumination, sharpness of definition, beauty of tone, or faithful rendering of the artists he represents. His contributions consist of forty-two subjects, after the modern pictures by Meissonier, Yvon, Paul Delaroche, Cabanel, Piloty, Alfred de Dreux, Horace Vernet, Wappers, Bellangé, Jalabert, and designs by Chéflart. La Rixe, the most beautiful of Meissonier's pictures, is reproduced the most perfectly of any painting I have ever seen. The print is a curiosity in more respects than one. It is the same size as the original picture; nevertheless, it equals it in delicacy, in power, and in gradation of colour, and is undoubtedly the best effort that photography has yet given in yielding us the value of tone and colour. It is alike an honour to the artist and the photographer. The printing is exceedingly good, of a rich violet; the mounting is upon India paper, and lettered with the title of the picture, and as being the property of the Queen of England. A copy of the same painting was exhibited at Kensington last year, but was only about one quarter the size of the present reproduction. One's attention is also arrested by No. 145, which represents the famous hemicycle of the theatre in the Palace of the Beaux-Arts at Paris, and painted by Paul Delaroche. This proof is about two feet long, and evidently required great skill in the photographer, owing to the extreme length of the picture in relation to its comparative lowness in height, and was so difficult a subject to render that one of the principal Paris photographers, after several months' efforts, had to relinquish it, when recourse was had to M. Bingham, whose success is therefore more creditable. The subject is so well known that it is unnecessary to say more than that it was entirely the work of Delaroche himself, untouched by any of his pupils. In the photograph we find fully defined the countenances of all the great artists of the past ages. It forms one of the series in the *Galerie Photographique*, published by Goupil & Co., which, from its choice character, has already an European reputation. Proofs are very tastefully mounted by this firm. The admirer of old paintings will be much pleased with the copy of Apollo and Marsyas, by Raphael, the lights, shadows, and definition being as good as if the reproduction were from a crayon drawing, and not from a picture renowned for its colour, drawing and tone, though browned with age and varnishes. A copy of this proof was exhibited at the last exhibition in London. The *Athenæum*, in its review at the time, asked, why was the photographer's name concealed? I could answer this question at length, but will content myself by saying, simply to hide the name of the successful operator, Monsieur Bingham, to whom the owner of the picture came over from England.

The copy of the painting by Alfred de Dreux, of the Emperor Napoleon III., is the best and most characteristic representation of His Majesty that has yet been published. He is seated on his favourite charger at a review, while the army defiles before him.

Bisson Frères are noted for their excellent reproductions of engravings, which have a sharpness and beauty of tone not surpassed in this exposition; they have also a reputation for their views of the monuments of France, &c., but of which they must take more care. No. 170, inscribed in the catalogue as central doorway of the Cathedral of Reims, is in reality a view of the lower part of the façade of Notre Dame, at Paris, but it is quite a caricature of the front of this church—the lines of the architecture, which should be perpendicular, rapidly converge from the ground line towards a common centre in the upper part of the picture, which defect quite destroys the effect of the design and proportions. Such deviations in a severe architectural view cannot be allowed to pass uncondemned. No. 171—view of the Hotel de Ville, Paris—is not equal to the view published by Baldus, which, strange to say, he does not exhibit. Nos. 172 and 173 are, perhaps, the finest proofs Bissons expose, and for the details of the sculpture, the lights and shadows, the very veins of the stone-work are not to be excelled; the perpendical lines and perspective of the architecture are faithfully represented. These two views are admirably printed from the negatives of M. Godet, to whom much credit for the excellency of his manipulations and judgment is due.

Disderi & Co. exhibit the best portrait in the gallery; it is one of very large size, taken by a lens made by Hermagis, sixteen centimetres in diameter, and is wonderful for its definition, modelling, and illumination. The mounting does credit to Disderi's taste, the *biseau* being of a pleasing shade of drab which, with lines of tooling and gold, relieves and adds value to the colour of the proof, which is well printed. There is a frame enclosing portraits, for

visiting cards, of members of the imperial family, which are as inferior as the abovenamed portrait is good. Prince Napoleon is represented like a Daniel Lambert; the faces are badly lighted and dark, as if under-developed. Disderi had lately the honour of receiving the Emperor, Empress, and the young Prince Imperial, at his *atelier*, on the Boulevards, the first photographer who has been so honoured. Messrs. Mayer and Peirson, to whom the imperial party had already sat, had the great disadvantage of having to operate at the palace, with such indifferent light as came from a window, and the inconveniences attending a temporary service: this was pointed out to their majesties, but they were unwilling, at that time, to visit any *atelier*. Mayer and Peirson were consequently unable to publish such excellent works as they are justly renowned for producing at their gallery, and it is to their greater credit that the stereoscopic portrait of the Emperor yet remains one of the best, if not the best portrait yet before the public. Let us wait to see what Disderi, who has profited by the objections of Mayer and Peirson, will do, for he is commissioned to print 20,000 proofs from the negatives he has taken. We are told that the little prince is headstrong and self-willed; and though Disderi says he succeeded well so long as he had the prince to himself, yet, when the Emperor and Empress arrived, and Disderi prepared for a group of three, his highness spoiled nearly every picture by moving during the exposure of the plates. The mode of operation, it is said, was thus arranged to save time and proceed with despatch: the glasses being all cleaned, one operator collodionised and sensitised them; Disderi posed, while a second operator focussed, and a third developed. Disderi's mode of operation was to count one to seven, while the plate was exposed, begging his august patrons to remain still until he pronounced the final seven! During one pose Disderi, chronometer in hand, commenced one! two! three! when the young heir to his father's greatness changing his posture to that of Achilles, in Hyde Park, shouted SEVEN! to the uncontainable but uncourtly laughter and amusement of the Emperor and Empress. But oh! ye photographers, what would you say of the perseverance of your great Parisian brothers, who previously having procured a model, and arranged him differently thirty or forty times, so as to secure an unimpeachable pose, the position of the hands, feet, and head, being all carefully marked for after use? judge then of and pity the chagrin of the unhappy Disderi at this *contretemps*.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER III. *(Continued.)*

ON COLOURS AS PIGMENTS.

Paints or pigments have properties apart from such as they possess merely as colours, viz.—purity of colour, transparency, quality of working, and of drying, body permanency, &c. — some knowledge of which is of evident importance to the embryo colourist.

As these instructions will combine colouring in oil, water, and powder, or dry colours, I shall now consider the various paints with regard to the requirements of these several processes.

The properties of pigments vary with the vehicles in which they are used, the grounds on which they are laid, &c.; and these properties are also modified through combination with other paints. Their colours are sometimes injured by light, or the absence of light, by pure or impure air, by damp, by oxygen, sulphureted hydrogen, &c. — some by one cause, some another, some more, some less. Many pigments must be altogether rejected by the conscientious artist, but we have plenty which are good, although some of these require the exercise of judicious care. I will now give a list of the principal pigments in use, pointing out the peculiar defects and advantages of each one.

WHITE,

The complementary of black, gives depth to, and harmonises with, all other colours. By mixture, it forms those tints of colour, which being nearly allied to light, at once catch the eye, by apparently advancing before the colours and shades about them; it should be pure and permanent.

In oil painting, an English white lead, called *flake white*, is most used. Too much oil should be avoided in its preparation and application, as it will otherwise become discoloured: a little black should be employed with it, to counteract its tendency to turn yellow. This pigment should not be used in water-colour painting, as, when unprotected by some "vehicle," it rapidly blackens.

In water colours the best whites are the "Constant" and "Chinese." *Constant white* is sulphate of baryta — *Chinese white* is a preparation of oxide of zinc: each of these possesses great advantages. White is seldom used in tinting with dry colours.

OF YELLOW PIGMENTS.

Yellow being closely related by its luminous character to white light, is always very prominent and attractive in a picture. Being a very delicate colour, its brilliancy is too easily lowered, and its primary beauty destroyed by mixture with other pigments; great care should therefore be directed to the preservation of its purity. Yellow pigments are very numerous; some are beautifully transparent, others opaque. I shall only name such as are more generally used. *Perfectly pure yellows* are very rare.

Gamboge — A most useful colour, both in oil and water — very bright and transparent: being a gum-resin, it serves a similar purpose to that of varnish in the preservation of other colours, more particularly when water is the medium. Although it is not quite permanent, it could with difficulty be dispensed with, especially by photographic colourists.

Indian yellow — A very rich full yellow (more useful in water than oil painting, being in the latter case very fugitive, but in the former tolerably permanent), is an urio-phosphate of lime; is not injured by foul air, and is sometimes (I think erroneously) called permanent.

Gall Stone — A very powerful golden colour, more eligible for water than oil medium, although not permanent in either; an animal secretion, chiefly in use among flower painters. It must be used with extreme care, and well shielded from chemical action.

Cadmium yellow — A very brilliant metallic production, permanent both in oil and water;* of tolerable power, and much used in draperies.

Naples yellow should not be applied in water, although such colourists as use body colour for painting flesh tints compound most of them with this dangerous pigment; protected in oil by varnish, it is however safe and very useful, working well, drying quickly, by becoming hard, and is almost indispensable in mixing flesh tints. It must not be brought into contact with iron; a pallet-knife of ivory should therefore be used, and such colours as contain iron avoided in its application to compounded hues; it is obtained from zinc and antimony.

Yellow ochres are not powerful or brilliant, but are the most ancient and honest of pigments, pleasing in hue, permanent, and working well in oil and water: they vary in colour from a rich broken yellow to a warm brown, are semi-opaque, and are always useful both in themselves and for compounding. They are earths.

Raw Sienna — An ochre; is permanent, and of good power; has more body than the ochres, and is more transparent; a very good and useful pigment both for water and oil.

Chrome yellows are very pure, bright, and of good body, useful in oil and water: their permanency is a disputed point, but few painters reject them. In mixtures they must be used with extreme care (Prussian blue is entirely destroyed by them). They are chromates of lead.

Lemon yellow — A delicate, permanent preparation from platina I use this instead of Naples yellow *in water:* it is somewhat opaque but works well either in touches or washes.

(To be continued.)

Errata.—In the last portion of this article two or three typographical errors escaped correction; they were, however, of but little importance to the sense, save the two following, viz.—in page 154, first column, for "the red *is* green," read "the red *its* green; for "art *interest*" read "art *student*."

Photography Applied to Musketry.—A series of interesting and valuable experiments have been made during the last few days, by Lieutenant Walker, 79th Highlanders, of the School of Musketry Staff, Hythe, in the application of the photographic art to the science—for such it has become—of musketry, with a view of obtaining, by means of the former, a true and exact copy of the target practice of a section, or any other number of men at one or more targets. We are glad to learn that these experiments have been attended with a most satisfactory result, Lieutenant Walker having established by them the important fact that, by means of the chemical influences of light, every "hit" or impingement of a bullet, however slight, can be transferred from the target to paper with an infallible accuracy, and a celerity which at once renders obsolete the former tedious and, oftentimes, inaccurate method of copying by the hand the impression made by each shot on the target's surface into a diagram, which had previously to be prepared for the purpose. This novel adaptation of photography will be found peculiarly useful in testing the comparative merits of different

* I have heard of no instance to the contrary, but it is a recent introduction.

firearms; and in these days of volunteer rifle corps it would prove highly useful and interesting if each company had a photograph taken of its target practice; and, as any falsification of returns would by this plan be rendered impossible, on a great comparison being made of them throughout the country, it would at once be seen to which corps belonged the palm for the best shooting.—*Hythe Gazette.*

Letters to a Young Photographer.

No. XIII.

My Dear Eusebius,

I had not the remotest intention of wounding your feelings in my last epistle. You crowed so loudly over your first chicken, that I thought it would do you no harm to set you down a peg, and take some of your conceit out of you. Had I not done so, you would doubtless have put an end to this correspondence, by turning round and commencing to teach me. I scorn to flatter, but am not tardy in rendering justice where it is due. I should have been but a blind teacher, and you the dullest of pupils, if by this time you had not arrived at some fair degree of proficiency; but to allow you to suppose you had reached the goal, would have been to stultify you for ever. It is just twenty years ago since I made my first photographic experiment, and although I feel as capable of obtaining a good picture as any of our craft, I am no more certain of a good result beforehand, nor of the power to command success, than I was at the commencement. You may consider this a very humiliating confession, but the fact is due to the delicate and subtle nature of the art. You may take pictures every day for a month with scarcely a single failure, when suddenly a flaw appears, which it takes a week or more to set right.

I have heard of photographers who were born such. They came forth, like Minerva from the head of Jove, full grown and full blown, but I avow I never saw one. Once upon a time I looked into the operating room of one of these conjurers, and saw a woeful waste of nitrate of silver, and a perfect chaos of bottles, dishes, baths, pewter pots, and tobacco pipes, but I saw few good pictures. I was forced to the conclusion that the professor bought his triumphs ready made. But cheer up, my dear Eusebius. You are as far advanced in our art in the short space of six months as I could have been in twelve years, because I had to await its growth and development. Your name is wafted from Indus to the pole. The printing-presses of America, India, and Australia, spread the name of Eusebius far and wide over the ever-extending map of the civilised world; and should you ever make a visit to New York or Philadelphia, you will be fêted in such a style as will make Dickens and Thackeray envious. Your productions will be sought for with avidity by the connoisseur collectors who love to enrich their portfolios with the treasures of our art. Eusebius, you are born to greatness—I will not thrust it upon you. But, *credat Judæus!* there are heretics who would deny your existence—who would persuade their dark little world that you are only a myth! Send the certificate of your baptismal register to our publisher, and he will publish it in his next number, and so prove to the world that Eusebius, the son of Theophilus, is of good descent, and can flout at the witlings of Tooley Street.

But truce to this digression—let us resume business. Your last pictures, which the carrier has just brought me, arrived in good condition, and I can honestly pronounce them better even than your first picture, which, seriously speaking, was very good. Do abate one jot of care and skill in your manipulations: success is not apt to make us careless, and you may soon find yourself floundering in a slough of despond, amid fog, spots, streaks, stains, and all the other mosquitoes of the operating room.

But "summer is a-coming in," as the poet sings, and you will be longing to start on a campaign, to try your prowess in the tented field. You will want the best "preservative" process, or the most perfect "dry" process. You will be debating the merits of Taupenot, Fothergill, and Despratz, and decide upon employing turpentine-waxed-paper, because it is the least cumbersome, and will enable you to dispense with a "navvy" to carry your knapsack. I shall, therefore, devote the remaining space of this letter to the details of that process, because it is one that has many recommendations to the neophyte, who is very apt to be discouraged by difficulties. I have pictures taken by the turpentine-waxed-paper process, which few would believe but that they were printed from collodion negatives.

Turpentine, it must be confessed, is not so savoury as raspberry syrup, still it is not to be despised. I could save myself a great deal of trouble if, instead of describing the *modus operandi* of this section of photography, I were to tell you to buy a shilling pamphlet upon it. But that would be ungenerous and unkind. I know to my cost how little can be got from books by those who are ignorant and seeking information. Few who write on these matters possess the art of communicating their instructions in a clear, concise, and methodical manner, or of arranging their ideas in the proper order of succession. Mounting on stilts, they can rarely descend to the level of the understandings of the uninitiated. In fact it is no easy matter to address intelligibly those who know nothing of the subject under consideration. It is absolutely necessary to presuppose a certain amount of knowledge in the learner, which becomes a stumbling block to his understanding. After this admission, it may seem something like arrogance in me to proceed, but I do so at all risks.

It is of primary importance to obtain paper of the best quality for this process. You can buy Marion's paper ready prepared, but you can prepare it yourself in the following manner:—Dissolve in one pint of camphine one ounce of pure white wax, and add to the solution two drachms of pure iodine. The mixture becomes violently agitated, and of a deep red colour, which afterwards changes to a golden yellow. Then add to it two ounces by weight of castor oil. Immerse the paper in this compound for three or four minutes; it becomes transparent and like parchment in texture. Hang it up to drain and dry, and then keep it between the leaves of a blotting book until required for sensitising. It will keep in good condition for some time.

This paper, when sensitised upon a nitrate of silver bath, yields very good negatives; but the paper not being very sensitive, it requires a long exposure in the camera. By employing a second process the exposure may be materially shortened, in fact the paper may be rendered as sensitive as collodion.

A sheet of the waxed iodised paper is floated for about fifteen minutes on the following solution:—

Water	20 ounces.
Sugar of milk	1 ounce.
Iodide of potassium.	3 drachms.
Bromide of potassium	40 grains.

The sensitising bath is composed as follows:—

Distilled water	8 ounces.
Nitrate of silver	4 drachms.
Iodide of potassium	4 grains.
Acetic acid	4 drachms.
Citric acid	4 grains.

When sensitising the paper you will require three dishes—one to contain the filtered nitrate solution, the others to contain distilled water. The paper is to be floated on the solution until it loses its red hue, which will be in two or three minutes, then removed to the first dish of water, and freely moved about in it, and next transferred to the other dish, and when well washed hung up to drain and dry, first removing the excess of moisture by placing the sheets between folds of blotting paper. This operation must be carried on in a darkened room.

The time of exposure in the camera will of course depend upon the intensity of the light; it will vary from half a minute to two or three minutes: be careful to avoid over-exposure. Development should be effected on the same day as the exposure if possible: sometimes the paper will keep in good condition longer, if placed in an air-tight box, but it cannot be implicitly depended upon. The developing solution is made by adding four ounces of a saturated solution of gallic acid to four ounces of water and eight minims of the sensitising solution. Float the paper, exposed side downwards, for a few minutes upon this bath, until the paper becomes flat and the image has begun to appear, then with a glass triangle push it into the solution, and keep it beneath the surface—a task of some difficulty, as the paper, being saturated with wax, will not easily become wetted, and rises to the surface. The development must be prolonged until the sky appears intensely black, as the intensity becomes much reduced in the subsequent fixing solution. If the proofs acquire a dirty yellow colour in the developing bath, it is no prejudice to them, they will still yield good positives. When the proof is thoroughly developed, wash it in two changes of water, and then fix it in a solution of hyposulphite of soda, of the strength of two and a half ounces to the pint of water. When the yellow iodide is all dissolved out, wash the proof for three or four hours in several changes of water, then remove the moisture by placing them between folds of blotting paper, and suspend them in the air to dry.

If the proofs present a mottled appearance, hold them before a clear fire; they may possibly require a second waxing, which is performed in the usual manner.

J. P.

Photographic Glossary.

Nitrites — Salts formed by the combination of nitrous acid with the bases. The only one of interest in photography is the nitrite of silver.

Nitrite of Silver — A compound of nitrous acid and oxide of silver, containing one atom less of oxygen than the nitrate. It crystallises in long slender needles, soluble in one hundred and twenty parts of water at 60°. Fused nitrate of silver is apt to contain nitrite, which, when present in a nitrate bath, is liable to produce fogging.

Nitro-Muriatic Acid: Nitro-Hydrochloric Acid — A mixture of hydrochloric and nitric acids, called also *aqua regia*, as it enjoys the property of dissolving gold, the king of metals. If a metal is immersed in this compound it dissolves rapidly in the state of chloride. The metal encounters chlorine in the nascent state under circumstances in which the combination takes place most easily. *Aqua regia* acts as a very energetic oxidiser.

Nitrous Acid—An acid which contains two atoms less of oxygen then nitric acid. When dry binoxide of nitrogen and oxygen gases are mixed in proper proportions and exposed to the temperature of zero, they condense into a limped blue liquid, which is nitrous acid. It is decomposed by water, therefore cannot be made to unite directly with the metallic oxides; but a well defined series of nitrites may be formed by indirect means.

Nordhausen Sulphuric Acid — Fuming sulphuric acid. It is a combination of two equivalents of sulphuric acid and one equivalent of water; its density is 1·90. It is distinguished from ordinary sulphuric acid in containing less water.

Nitrogen — A colourless, inodorous gas, unsuited to respiration or combustion. It forms, however, nearly eight-tenths of the atmospheric air. Its combinations with oxygen are very important in chemistry and the arts, especially nitric acid.

Objective — The name given to the various combinations of lenses employed in photography. It is a useful word, as it expresses the series of lenses which combine to form a compound, which is commonly but erroneously termed the lens. The origin of the word objective is in consequence of the compound in the telescope and microscope being towards the object.

Oxalates — Combinations of oxalic acid with the bases. Those of most interest to the photographer are the oxalates of iron, silver, and soda.

Oxalic Acid — This acid is found in very considerable quantities in various vegetables, combined with potash or lime, and it may be prepared artificially by the action of nitric acid upon sugar, starch, cellulose, &c. It is white, solid, of a sharp sour taste, soluble in water and in alcohol. It is a very active reducing agent, and is capable of playing an important part in photography. Its solution reduces the salts of gold with facility.

Oxides — Compounds formed by the direct union of oxygen with other bodies, bear the general name of *oxides*, which are, for convenience, divided into three principal groups or classes. The first division contains all those oxides which resemble, in their chemical relations, potassa, soda, or the oxides of silver or of lead: these are termed *alkaline*, or *basic* oxides, or *salifiable bases*. The oxides of the second division have properties exactly opposed to those of the bodies mentioned: oil of vitrol and phosphoric acid may be taken as the typical representatives of this class; they are called *acids*, and they tend strongly to unite with the basic oxides. When this happens what is called a *salt* is generated, as sulphate of potassa or phosphate of silver, each of these substances being compounded of a pair of oxides, one of which is highly basic and the other highly acid. The third group, from their slight disposition to enter into combination, are *neutral* oxides, of which the black oxide of manganese is a good example. It very frequently happens that a body is capable of uniting with oxygen in several proportions, forming a series of oxides to which it is necessary to give distinguishing names, such as the protoxide, binoxide or deutoxide, teroxide or tritoxide, sesquioxide, peroxide.

Foreign Correspondence.

Paris, June 25, 1859.

When we consider how wide is the domain, and how extensive the applications, of photography, we cannot but be surprised to see how slowly they are recognised, and how little apt we are to avail ourselves, not only of the unique facilities afforded by photography, but of many other discoveries of modern science. There is a morbid eagerness for the *new*, but a singular apathy in adopting it when found. Discoveries of the utmost importance are repudiated simply because they disturb our habitual notions, and involve the necessity, in accepting them, of a change in habits. I do not know of a sadder or more humiliating task than that of looking over the annals of discovery and invention. Things, which if adopted by society, would affect great improvement in its social condition and welfare, lie dormant and unproductive for no other apparent reason than because they were not familiar to the past generation. Many of them are rediscovered, and bring loss and disappointment upon the discoverers. A list of the discoveries and inventions of the present century, for instance, having for their object the improved ventilation and heating of our dwellings, with other items of domestic comforts, would fill a volume. Yet not in one house in a hundred will you find them introduced. And so it is with many other things. The world appears to prefer its old ways, with all their inconveniences, to the adoption of new ones; just as the individual prefers his old shoes and coat to the new, simply because they fit easy.

Photography has not fulfilled a tithe of the indications it promised. It is too much limited to mere pictorial representation. Its value as a most accurate delineator is generally admitted, but very seldom acted upon in the majority of instances where its aid would prove of the utmost importance. The artist accepts its aid with a certain air of condescension; acknowledging its value but neglecting its assistance, he acts as if he were jealous of it. The architect but rarely invokes its aid, nor does the engineer or surveyor. The microscopist and the astronomer make a show occasionally of applying it to their respective pursuits, and now and then the surgeon employs its aid in delineating bases of extraordinary deformity, or of uncommon interest. But it is to pathological science that the peculiar resources of photography promise the most important results. I have seen at Clamart some stereoscopic views of regional anatomy, with representations of the lymphatic vessels. Any one who has examined drawings of these objects will acknowledge how extremely difficult it must be for the hand of the artist to trace what his eye perceives. In fact it requires that the artist should be also an anatomist. A photographic artist is permanently attached to *La Clinique*, whose special office it is to obtain representations of cases both before and after operations, thus providing a record of each interesting case which will be useful hereafter, not only as a reference but as a means of instruction. I have lately examined with the deepest interest some exquisite photographic illustrations of comparative embryology, taken by an enthusiastic anatomical friend of mine, which when given to the world will excite, I am sure, the greatest interest and admiration. This series of human embryology is complete; he has obtained delineations of the fœtus, at every stage of growth, at intervals of fourteen days. He has also a series of the sheep, another of the dog. Another series represents every succeeding day's progress in the incubation of an egg. After viewing these representations, and comparing them with engraved plates of the highest class, I could but award the palm of superiority to the photographer, and I felt proud, too, that I was myself a humble follower of so valuable an art.

What artist has ever succeeded in depicting the diseases of the eye? But the photographer steps boldly forward, exclaiming, "That task is mine!" M. Cusco, an eminent surgeon has, as I lately intimated, obtained photographic images of abnormal conditions of the choroid, taken both from the living subject and the dead, which possess much interest and value to the ophthalmist. The anatomical changes of the deeper membranes of the eye can only seldom be verified by direct examination: their decomposition takes place very rapidly, consequently they are but little known. But ophthalmoscopic observations increase daily, demanding strict anatomical control, which alone can fix the opinions of pathologists as to the value of these operations. Nothing will better conduce to this end than photographic images of these occular lesions. The images exhibited by M. Cusco are (on a scale of 2½ diameters), *(a)* the papilla; *(b)* a large portion of the choroid, deficient both of pigment and vessels, and where the sclerosique is seen by transparency; *(c)* on the side opposite to

the papilla, a smaller spot of the same kind; *(d)* a wave of pigment circumscribing the papilla on its interior; *(e)* the circumferential portion of the choroid, in nearly its normal condition. Those who are acquainted with the difficulty of treating diseases of the eye will appreciate these photographs at their true value.

My esteemed and learned friend, Dr. Ducheune, lately showed to me his "physiognomical album," which is a new reading of Lavater. The album represents the muscles of the face excited by electricity. The subject operated upon was an old man, one side of whose face was paralysed. The results are very curious and instructive.

In the human face there are great lines which command the expression of the rest; the eyebrow is one of these, and the principal one: raised by means of a muscle which occupies the forehead, it expresses astonishment, surprise, or attention, On this account M. Ducheune calls the frontal *the muscle of surprise.* This action may be observed in the pit of a theatre at the moment of the rising of the curtain, when the eye opens widely to receive the impression which comes to it from without. The opposite action, the lowering of the eyebrow, is produced by the upper portion of a muscle which enters into the composition of the eyelids, and which is known under the name of the *orbicular.* Its contraction expresses reflection, and for this reason is called the *muscle of reflection.* A small muscle situated in the eyebrow, is called the *muscle of pain,* as it produces the expression of it when it is in action. Another muscle, the pyramidal, placed across the root of the nose, appears intended to express wickedness; its energetic contraction produces an indescribable expression of ferocity upon the physiognomy: it has received the name of the *muscle of wickedness.*

Two other muscles, situated on the cheek, near the cheekbone, are the large and the small zygomatic, they produce weeping and laughter. There are many other muscles whose functions of expression are exhibited in this album, but as they occupy a less important rank than those named I pass them by.

To appreciate the amount of influence exercised upon the expression by each of the muscles, the contraction of each was successively provoked at the moment when the physiognomy was motionless; and the experiments were rendered more complete by the subject, in whom all the passions were in their turn evoked, being an old man, whose face was paralysed on one side. The contractions effected were first simple and isolated, expressive or inexpressive; then, proceeding from the simple to the complex, the muscles were contracted two by two, three by three, and in this manner compound contractions were obtained, which are termed concordant when they express a single passion, and discordant when, on the contrary, they result in producing only grimaces. There are some muscles which enjoy the privilege of depicting by their individual action an expression which is peculiar to them — their simple contraction is then completely expressive. This effect was formerly attributed to simultaneous contraction of many muscles. The researches of Dr. Ducheune show that this apparent general contraction of the features of the face is only an illusion produced by the influence of the lines of the eyebrow and of the forehead upon the other features, without other action than that of a relation of proximity, such as may be observed in different colours placed side by side. In each study care was taken to excite only one side of the face at the commencement, leaving the other motionless; so that by covering them alternately, we may judge of the change effected in the picture submitted to observation. Here we have developed a sort of living anatomy, which ought to be useful to artists. The physiologist will be better able to appreciate the functions of every muscle. The photography of the passions is delineated! But I hear the loud booming of the cannon at the *Invalides* — another glorious victory, I suppose! — Adieu. J. P.

Correspondence.

LUNAR STEREOGRAPHS.

To the Editor.

Sir,—In the early part of 1853, I took several collodion positive pictures of the moon, with the assistance of Mr. Thornthwaite; and as favourable circumstances presented themselves, I continued to do so alone, *and I frequently placed two photographs, obtained at different epochs in the stereoscope,* and proved to myself that a stereoscopic effect was obtainable in a greater or less degree. At that time I invariably placed the pictures in such a position as they apparently occupy in the astronomical telescope; but having resumed my experiments in 1857, it occurred to me to avail myself of the moon's libration in latitude, and to fix the pictures in any position suitable for this object, however much they might require to be turned round from their apparent position in the telescope. The immediate result was that globe-like representation of the moon for which I had long sought; and having satisfied myself, I took an early opportunity of showing the result to my friends; but I do not think that I exhibited publicly my lunar stereographs *thus* obtained until October, 1857. — I am, yours, &c. WARREN DE LA RUE.

The Observatory, Cranford, Middlesex, W.

OXALIC ACID IN COLLODION.

To the Editor.

Sir,—In your remarks in the last number of The Photographic Journal upon what was stated by my friend, Mr. Williams, at the May meeting of the Photographic Society, you say, that "from the residues of twenty Winchester quarts of old collodion, no less than 1lb. 5ozs. of oxalate of lime were obtained.

As this was not the impression conveyed to my mind by what fell from Mr. Williams upon that occasion, I have drawn his attention to the matter, and have his authority to state (preparations for a journey to the continent preventing his communicating with you direct), that what he found was, not 1lb. 5ozs. of oxalate of lime, but enough *oxalic acid* to form, by precipitation with a lime salt, 1lb. 5ozs. of that substance. Since that time, on repeating his experiments upon other samples of collodion residues, iodised and uniodised, made with pure and methylated spirit, he has noticed the following curious fact, viz. — that old iodised collodion yields oxalic acid; while plain collodion residues, whether made with pure or methylated alcohol, or ether, are found free from it. At the present moment, it is of course impossible to indicate the source of this substance, or the combination in which it exists. But I am sure the matter cannot be in better hands, and that upon Mr. Williams's return to England he will continue his experiments with a view to the elucidation of it.

You will pardon my intruding so much on your time and space; but the question is one of very considerable importance, and I think your observations might have a tendency rather to divert the attention of those who have the opportunity of working upon the subject out of the right channel.—I am, yours, &c.

JOHN A. SPENCER.

7, Gold Hawk Terrace, Shepherd's Bush, W.
June 11, 1859.

[We are always obliged by the correction of any error into which we have inadvertently fallen. The subject is one of great importance; but, independently of that, we are always glad to hear from Mr. Spencer.—Ed.]

DIFFICULTIES WITH DRY PROCESSES.

To the Editor.

Sir,—The great readiness and kindness you show in endeavouring to extricate the readers of your Journal from their difficulties, induces me to trouble you with mine.

Wishing to master one of the dry processes for taking landscapes, I began with trying the preparation of small plates; in doing this, I have entirely failed. I have prepared plates with metagelatine and with albumen, by Fothergill's and Lloyd's modes, and also preceded them by coats of albumen and gelatine, as done by M'Nab and others, and always had pictures showing more or less by transmitted light as if the film had been full of blisters. At first I attributed this to imperfect cleaning, and tried all plans of cleaning that have been proposed, also baking after cleaning, but without success; new and recleaned glasses have given the same results. I then attributed the defect to the collodion, which was old and slow, and procured a supply of Keene's, but the pictures were still marked in the same way. Some, when fixed and washed, showed blisters, others only the marks of them by transmitted light. Nothing of the net-like appearance can be detected in the early stages of development; it is only when it is pretty far advanced it shows itself, and it is not fully seen till the plate is clean. Iron and pyro-developers both give the same appearance.

I am quite at a loss to imagine the cause. My nitrate bath was made chiefly new about six weeks ago, and has not been much used; it is neutral, and gives a good wet picture with Keene's collodion.

Last night I cleaned carefully three new small plates. No. 1, I coated with dilute albumen; dried thoroughly at the fire, collodionised, sensitised, dried the back of it, put it two or three minutes in a bath of albumen, diluted about thirty times with water, making the albumen flow back and forward over it, washed it with a good quantity of water flowed over it, and placed it on blotting paper to dry. No. 2, I treated in exactly the same way, omitting the first coating of albumen. This morning I took three views of the house opposite my window, Nos. 1 and 2, on the two prepared plates, and 3 on a wet collodion picture—the same collodion, bath, developer, and cyanide being used for all. No. 3 was exposed three seconds, and gave a good picture, free from defect in the film. Nos. 1 and 2 I send you, both showing the defect I complain of. The markings in different plates vary greatly in size, as you will see in the skies of two trial prints which are enclosed.

The two plates I send were both alike when first completed, but thinking to make them safer for carrying, I wetted them, and poured some very weak gum-arabic on, which has greatly changed the appearance of No. 1. This plate showed blisters when drying. The change on the film by the gum does not affect the reticulated appearance to be seen by transmitted light.

If you can help me by directing me into the path so many say they find easy and certain, I shall be exceedingly obliged to you.

I only want to get into the practice of some mode pretty certain in its results, to use as an amusement, and which I can leave off and resume as my other avocations allow me. Begging you will excuse the trouble I give you with this, I am, yours, &c. J. W. M.

[Your case is well stated, except that you have omitted the details of development. We replied to you shortly in our last, and now proceed to give more extended details of manipulation, which we have no doubt will answer your purpose perfectly.

The marks you allude to are due to the condition of the collodion before immersion in the sensitising bath, but even these would probably not have shown had your exposure in the camera been longer, say double the time you have previously given. In warm weather, the more quickly you get the whole plate covered with the collodion the better as a rule. If it will not flow readily, add a little chloroform, as directed in our last.

Proceed as follows:—With the same collodion you have been employing coat your plate (either previously albumenised or not), and when well set immerse in the nitrate of silver bath. When ready remove and drain well. Avoid touching it with the naked fingers, but use india rubber finger stalls kept solely for the purpose. Attach a pneumatic plate-holder to the back, and pour on *two drachms* of distilled water for a stereoscopic sized plate. It will probably not flow well, but keep it in motion (which with the plate-holder is readily done), and, if necessary, pour it on and off with the measure *until it does cover the whole plate without showing any streaks.* Pour off and again drain well. Take of dilute albumen (as under), one drachm, and still holding the plate by the pneumatic holder, pour it along one edge, and make it flow regularly across the plate by slightly inclining it, let the surplus drop off at the further corner (which it will do appearing milky), and when it ceases to drop, or nearly so, leave the plate in a horizontal position, by standing down the plate-holder for about a minute, while you prepare the next plate; then take it up and hold it under the tap, or with a spouted jug pour on it common filtered water very copiously, to wash away as much albumen as possible, pouring the stream on the centre of the plate, and allowing it to flow off from each edge in succession. Lastly, flush it with a small quantity of distilled water, just enough to cover it, and set it on end to drain and dry. When apparently dry, unless it be kept for several days before use, it will still want artificial heat; if so, place it for a few minutes upon a *hot brick.* It is more sensitive, and less liable to blister if perfectly dry.

After exposure, when you wish to develop, just wet the surface all over, under the tap or otherwise, and drain pretty closely; cover it with your developing solution, to which a few drops of solution of pure nitrate of silver have been just previously added. The developer may either be an iron one, or gallic or pyrogallic acid; the first restrained by the addition of citric or sulphuric acid—(formulæ given in recent numbers)—or the last by citric or acetic acids; gallic acid requires no restraining acid, but takes a longer time to do its work. In cold weather we prefer iron, in hot, pyrogallic and citric acids.

The albumen solution to be made as follows, viz.:—

White of egg	1 ounce.
Liq. ammoniæ	15 minims.
Chloride of ammonium	8 grains.
Water	7 ounces.

Mix, put into a large bottle, and shake well. Allow it to stand before using for twenty-four hours, and filter through sponge or cambric. It will keep good for a very long time.—Ed.]

PHOTOGRAPHIC DIFFICULTIES IN INDIA.

To the Editor.

Sir,—Encouraged by the prompt and obliging way in which you answer correspondents who consult you respecting their photographic difficulties, I take the liberty of asking you to be so good as to assist me in getting out of a mess which I have got into in practising, or rather attempting to practise, Long's calotype process, as described in pages 174 to 179 of the *Journal of the Photographic Society* of the 22nd December, 1856. The paper is headed "Modification of Paper Processes," by Mr. Charles A. Long. I am told that Mr. Long is a *first-rate* photographer. However that may be, I cannot manage his modified calotype process at all; and I am very desirous, therefore, of getting the opinion of so eminent a critic as yourself upon it. In case you cannot conveniently refer to that number of the London Journal, I quote Mr. Long's own words:—

"Take of gelatine half an ounce, and dissolve thoroughly in one quart of distilled water. When quite dissolved, add one and three-quarter ounces of iodide of cadmium. Stir the mixture, still warm, until the whole of the cadmium salt is dissolved; then throw it into a 'funnel' and filter," &c.

This is Mr. Long's cadmium iodising solution. But *I* cannot make it; for the instant I commence adding the cadmium, the whole coagulates into a mass of sticky gluten, adhering to every thing most unpleasantly. With a great deal of perseverance I could not bring it into solution. I have tried *repeatedly*, and met with the same disappointment; and yet Mr. Long speaks in the highest terms of this process. I am all the more anxious to succeed in making a good cadmium-iodised paper, because I have an idea that it would be just the thing for such a climate as this. I need scarcely say, then, I shall be very much obliged if you will kindly indicate the probable cause of my failure, or suggest a better way of making a good cadmium calotype paper for use with gelatine. I shall anxiously look for your reply in the June or July number of your Journal. A really good *paper* process is still a desideratum out here. The collodion process can only be worked out here, with any degree of certainty, during four months of the year. Do you think that the new alcoholic collodion (Mr. Elliot's?) would do very well out here during the *hot* weather? If you think you can recommend the trial of alcoholic collodion, you would, I am sure, confer a great boon on many photographers in India, by inserting in your Journal a good formula for making it, mentioning, especially, the specific gravity of the ether and the alcohol, and the description of gun-cotton best adapted.

I have one more favour to ask. Can you recommend Mr. ———'s new *Petzval* combination of *portrait* and *landscape* lenses, which he makes in this way:—

A, B, and C are used together for portraiture; but for landscapes the back lens and cell *C* are removed, A and B remaining in the same position as for portraits. The diaphragms go in at E.

If this principle is a really good one, I cannot understand why there should be so great a difference between Mr. ———'s and Mr. ———'s prices.

The last mail has brought out news of Mr. Sutton's new architectural lens—"Sutton's Triplet." Can you speak favourably of it? I want to order out a first-rate landscape lens, but I am at a loss which to get. I would prefer a *good* combination for *portraits* as well as landscapes.

Excuse my troubling you with such questions. We poor photographers out here have not half the advantages of people in England in regard to consulting such eminent authorities as yourself. Your Journal is very popular in Calcutta. I sincerely hope your letters to "Eusebius" will enter fully into the subject of lenses and cameras.

I nearly forgot to mention that the beautiful specimen of photolithography, published in your Journal of the 1st February last, has created a great sensation out here.—I am, yours, &c.

Calcutta, 8th April, 1859. PLASSEY.

[Salts of cadmium and some other metallic bases coagulate albumen, but we are not aware that they have the same effect upon gelatine. What kind of the latter did you employ? We think if you dissolve your iodide of cadmium in water before adding to *ordinary* gelatine solution, you will avoid the annoyance complained of.

Should we return to paper negatives at any time, we should be inclined to follow a suggestion thrown out some time ago by Mr. Mayall, and take albumenised paper as a foundation to work upon.

The ordinary albumenised paper prepared for positive printing might be floated upon the solution as given by Mr. Long, and after drying, sensitised on the aceto-nitrate bath in the ordinary way, and slightly washed before use in the camera.

By attaching a sheet of albumenised paper to a glass plate at its angles, it could be readily covered with iodised collodion; if then immediately detached and floated on the usual sensitising bath, and afterwards washed and dried, a sheet of sensitised collodionised paper would be the result; but from certain experiments we have made, we have reason to expect that the picture, after exposure, would be *on the albumen,* and would be capable of development with pyrogallic and citric acids.

We see no reason why, in India, plates prepared by Fothergill's process should not be admirably available. Collodion, with a large proportion of alcohol, we think, would be advisable in a hot climate; but we are not sufficiently acquainted with the actual working of what Mr. Sutton has called alcoholic collodion to be able to recommend it with any degree of confidence, though we think it very likely to be good. Mr. Sutton's published formula is as follows:—

Methylated ether, S.G.·725	2 fluid drachms.
Methylated alcohol, „·800	6 „ „
Pyroxyline	8 grains.
To 3 ozs. of the above add 1 oz. of alcohol, as before	9 parts.
Water	1 part.

In 1 oz. of the above dissolve 14 grains of iodide of potassium.

The iodiser introduced by Mr. Mayall, as given in a recent number of The Photographic Journal, would very probably be useful for your purpose.

As regards lenses, you must remember that some kinds of glass vary much in density, and consequent dispersive power. This variation requires more careful adjustment of the relative curves of the different surfaces to get the best effect than novices are aware of; and as it is easier to cultivate the *hand* than the *brain,* those who require the work of the brain must pay a price accordingly. This will account for a great difference in price demanded by two makers for what is *apparently* the same thing.

There is a mistake in your apprehension of the method of using the lens alluded to; the *three* combinations are not intended to act together, but the front and back alone for portraits, and front and middle only for landscapes.

We think you had much better not attempt to make the same lens do duty in two capacities, something must be sacrificed in quality to effect it. If you can afford it, you had better buy two separate articles. The lens you mention last is cumbersome, and only intended for one purpose. It is also very slow in action.—Ed.]

DEVELOPMENT AFTER FIXATION.

To the Editor.

Sir,—With reference to the various theories which I see given for the development of prints after being subjected to the action of a hypo solution, I would be much obliged if you or any one will inform me whether it has yet been ascertained, by *actual analysis*, that silver in any style is contained in the image left. Should it turn out that there is actually *no* silver left, the possibility of producing an image by after-application of silver along with gallic acid, would indicate that the phenomenon was owing either to some wave power "impenduelle" or other influence disengaged during actinisation, by the silver salts having been retained by the film; or else to the film having been thrown into some state of change analogous to eremacausis, rendering it a silver reducer.

I am, yours, &c. C. J. B.

CYANIDE OF POTASSIUM IN FOTHERGILL'S PROCESS.

To the Editor.

Sir,—You will much oblige by answering in your next number, if possible, the following queries:—

(1) Is the use of cyanide of potassium incompatible with that of *Keene's collodion?* I have scarcely patience for hyposulphite, but cyanide makes the film so tender, that it is next to impossible to keep it all on the glass during the last washing. Must I resign myself to the tender mercies of the slower salt, or is there any way of making my *fast* friend behave a little better?

(2) Does it hurt the nitrate bath to filter it rather frequently, say once a week? My photographic room has to answer for chemical laboratory, carpenter's shop, and sundry other uses, and it is not possible to keep all my solutions quite free from dust always; even if I keep them covered up dust will float in the atmosphere.—I am, yours, &c.

London, June 23, 1859. A. H. B.

[1. Not incompatible with Keene's collodion in particular; the chief objection to its use being, that in conjunction with albumen the *intensity* is so reduced that a redevelopment is frequently necessary. The tenderness of the film is possibly due to the removal of the albumen by the cyanide of potassium. We think you will really *save time* as well as get a better picture by employing hyposulphite of soda.

2. Not if you keep a funnel and filter paper exclusively for the purpose, using the *same* paper repeatedly.—Ed.]

FOTHERGILL'S PROCESS.

To the Editor.

Sir,—As you have published "I. H.'s" letters, so strongly condemning Fothergill's Process, will you kindly find room for a few words in favour of it, from one whose experience has been just the contrary of his. I have tried it under every disadvantage, viz.—an acid bath used for positive portraiture, old collodion, that from age was quite useless for any other purpose, and some albumen that was prepared for coating plates as directed by Mr. M'Nab, about two or three months old. With the first plate so prepared I got a negative of a building "that was badly lighted" in six minutes, a print from which I enclose, with Goddard's lens, 13 inch focus, ½ inch stop. I have also used the process with Lloyd's modification for printing transparencies, and my success has exceeded my most sanguine expectations. I do not think anything can be more certain or less troublesome. A few days since I received three prints from a gentleman in Ireland who has worked Fothergill's process. Two of the prints were by that process, and one by wet collodion. The two from the dry plates were far the best: they were equal in manipulation to any that I saw in the Crystal Palace at Sydenham, about six months since.

Now, respecting Keene's collodion, the following facts will go some way in proving its qualities. A gentleman here, a member of the Photographic Society, sent for some of Keene's collodion, and prepared twelve plates, six of them by Fothergill's process, and six with oxymel. I went with him on one excursion, and he exposed seven plates: five were really beautiful negatives, and the others were pretty good. One of the oxymel negatives proved to be, *in every respect*, equal to wet collodion. I have never before seen any dry process give such beautiful results as that of Fothergill's.

GLYCERINE *versus* SUGAR.

Messrs. Murray and Heath have offered to photographers a substitute for the very easy and certain process first published by me in this Journal, nearly twelve months ago, for "deferring the fixing of negatives." There may be *chemical reasons* for so doing, similar to the raspberry syrup instead of oxymel; but I know the glycerine will not answer so well, and advise photographers not to try it. The glycerine will fog the plate in a few hours, while by using the syrup plates will keep for a week, as I have proved by *actual experiment*. I, when in London last, about six months since, called upon Messrs. Murray and Heath, and suggested to some one there to use the syrup in a bath, instead of water; and also mentioned that the proportions were to be found in your Journal and in a contemporary publication.

You have kindly gievn me the credit of being the first to introduce the syrup in this way, for field work, in your last leader, and I may say I have never found it fail in its intended purpose.—Yours truly,

Swansea. THOS. GULLIVER.

IMPROVED PLATE RACKS.

To the Editor.

Sir,—The suggestion by your correspondent "Ajax," in your publication of the 15th May, is not quite new. I have a machine for cutting the grooves for plate boxes of the shape described, and find it much approved of. Enclosed is a sample.—Yours, &c.

June 24, 1859. H. FRANCIS.

PATENTS CONNECTED WITH PHOTOGRAPHY, &c.

To the Editor.

Sir,—In reference to the remarks in the first leading article of the number for the 15th inst., as to the subject referred to in Mr. Rejlander's letter, allow me to suggest as a remedy in some degree for the evil complained of, that a statement be from time to time set out in your Journal of all inventions (deemed as such), in any specification of a patent relating to photographic affairs, or of the apparatus and chemicals used therein, with a request to your readers for information whether any such invention had been previously in use.

My own impression is, that except as to apparatus, it would be very difficult to secure a patent right for any improvement or invention relating to photography, and much more difficult to obtain evidence of a breach of such right from what is done in the mysterious gloom of the operating room.

For the guidance of your younger photographers, I have to suggest the use of a piece of gutta percha, made into the shape of a spout, being fastened to the necks of the bottles containing the developing and fixing solutions, by which means glasses can be dispensed with (except in the negative process), and also the use of an old metal teapot, with a piece of gutta percha tubing fastened round the spout of it, the outward-end of tubing being compressed into a longitudinal slit, as a washing utensil.

London, 16th June, 1859. I am, yours, &c. J. P. H.

[Unfortunately it does not appear at all difficult to obtain letters patent for almost any alleged invention or improvement in photography; and although but few of them would probably stand the test of a legal inquiry, that does not prevent the holders of said letters patent from taking or *threatening* legal proceedings against those who practice or use the alleged invention. This is precisely the wrong for which we desire a remedy; but to attain this it requires more than the influence of an individual.

It is not easy to procure particulars of any matter for which a patent is sought, except at certain very limited times, and then only with considerable trouble. It is a subject that has engaged much of our attention, and we have been endeavouring for some time past to organise a regular supervision, but without success hitherto.—Ed.]

ANSWERS TO CORRESPONDENTS.

T. Turnbull.—Wash with common filtered water, and then just cover the plate with distilled water before draining.

Querist.—1. Wet collodion. 2. Pyrogallic. 3. Must be saturated—coat or plate immerse, and leave it in all night.

Amicus.—We shall be happy to assist you if you send particulars, simply saying you "do not succeed" is not enough.

We are obliged for your kind offer, but we never hardly get within some miles of your locality; it would take us an hour and a-half to get home, even if fortunate in a conveyance.

Veritas, &c.—We are sorry to be obliged to decline a private reply—our time will not permit. Collodion of a fluid, contractile, and horny character, is what you require. Collodio-albumen is not good for the purpose—a moist plate being best.

Your want of definition is most likely due either to an inferior lens or faulty focussing. Depth of shadow and clearness in the lights are not to be had if you *over-expose.*

H. Dean (Exeter).—We always employ chloride of lime for removing stains of nitrate of silver from the hands: it is not so efficacious if the nitrate has become converted into hyposulphite, but we have frequently removed even the latter by continued application of the chloride of lime.

Chronos.—Your best plan will be to adopt that suggested by Mr. Lyte. Make a solution of pyrogallic acid one ounce, in alcohol four ounces. Four minims (drops) of this solution represent one grain of dry pyrogallic acid. If the alcohol be pure and concentrated, the solution will keep any length of time.

Anhydrous Alcohol.—R. W. S. can obtain alcohol in a very high state of concentration, by filling a bladder with it, and suspending it, securely tied, in the sun, or in a warm room. The water gradually passes through the membrane, leaving the alcohol in a more concentrated state. Alcohol will not moisten bladder, and, consequently, does not permeate it. To those who do not possess the appliances of a laboratory, this simple method of obtaining concentrated alcohol is invaluable.

Received.—"Photographic Negative Processes," "Smith and Beck," "J. B.," "James," "O. G. R." and "T. Marson."

⁂ Our Notices of New Books are unavoidably postponed till our next.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 98, Vol. VI. — JULY 15, 1859.

Amongst the various pursuits that may be regarded as rather "up-hill work," photography in hot weather may certainly take its place. Not only are the incumbrances doubly heavy, the dark rooms or substitutes doubly stifling, but, worse than all, the chemicals, like spoilt children, are doubly troublesome, and just at a time, too, when you wish them to be upon their best behaviour. Of course one philosophises and invokes patience — prepares a plate with infinite care — in short does every thing most scrupulously *en régle*, only to find a foggy landscape, or a sitter's face the exact counterpart of mottled soap, as results. Such, at least, are the statements that reach us from several worthy correspondents, who appear to have exhausted all their known remedies, and tired out the patience of photographic friends by their clamorous demands for help. One writer piteously remarks that he has converted a friend into a bitter enemy by his unsuccessful attempts to procure aid, for the said friend being an amateur of *stupendous* reputation as a photographer, of whom it has been the custom to remark, when any unusually stubborn difficulty has arisen, "Oh! ask A about it; he'll be sure to get you out of it!" but lo! even he has no remedy for hot weather, and, worse than all, the faith of his followers has been shaken, the throne is in a tottering condition, and its occupant visits upon our correspondent's unhappy head the penalty due to a convicted rebel: hence it arises that we are now the recipient of this "tale of sorrow," not so much in the hope of our "being able to administer relief as to afford at least our sympathy."

We have, however, really so many complaints upon the same subject — difficulties from temperature — that instead of replying in our "Answers to Correspondents" to half the letters of the alphabet, "Constant Readers," "Photos in Fixes," &c., we prefer to discuss the matter here for general reference.

It must be borne in mind that, *as a rule*, chemical action is exalted in proportion to the elevation of temperature, while in some cases re-actions of a very energetic character become totally arrested as temperature becomes reduced. We may adduce, by way of illustration, the phenomena of fermentation and decomposition. Is it then surprising that the operations, necessarily of a delicate nature, upon which photography is altogether dependent should, in like manner, be subject to derangement?

The various ingredients employed by the photographer are each intended to play a special and definite part *under certain conditions*, one force being restrained by another until such time as it is possible for it to perform effectively under those conditions. If then the conditions be altered (in our case a given range of temperature), the "balance of power" becomes disturbed, and we have nought but anarchy and confusion instead of harmony and order.

Let us consider now what are our difficulties. First, fogging of the plate in warm weather, whilst in temperate weather the same bath and chemicals yield satisfactory pictures. Now, supposing the bath to be neutral, or very slightly acid, the fogging generally arises from too small a quantity of acetic, citric, or other *restraining* acid in the developer. We call these vegetable acids restraining acids when thus applied, because, when present in sufficient quantity, they *restrain* the reducing action of the developing agent (probably by supplying oxygen), for a certain moderate amount of time, excepting where, under the influence of light, an amount of actinic force has been acquired sufficient to overcome this restrictive action, the amount varying with the temperature. When acetic acid is employed, which is a volatile substance, if the developing solution happen to have been mixed for some little time, in warm weather it soon parts with a portion by vaporisation. In any case, however, the quantity of restraining acid required is always more in hot than in cool weather.

Some photographers attempt to make a compensation by extra acidity of the nitrate bath, and certainly this proceeding will to some extent remedy the evil; but it is one that we can scarcely approve, because although the requisite force is supplied, it is not brought into play at the best moment, previously to which time it is positively detrimental. Nitric acid is most effective in removing fogginess, but unfortunately it also produces materially impaired aptitude for the reception of the actinic impression. Moreover, the nitrate bath then requires restoration to its neutral condition on a return of ordinary temperature. We are strongly of opinion that it is highly desirable to keep the nitrate of silver solution in as uniform a condition as possible. It cannot be denied, however, that under a very high temperature it is almost impossible to secure clear plates without the presence of a very minute quantity of free nitric acid, and when this is the case we much prefer to introduce it by means of a little *free iodine* in the collodion, which gives it just *where* we want it, and in manageable quantities *when* we require.

The sum of our argument then is as follows:—In hot weather double the quantity of the acetic or citric acid in your developing agent, and if you still get foggy negatives add a drop or two of weak solution of iodine in alcohol to your collodion, enough to tinge it of a pale yellow colour.

We now come to our second annoyance — a mottled appearance of the plates when removed from the sensitising bath. This we believe to be due to the unequal evaporation of the ether and alcohol from the collodion before immersion of the plate in the nitrate bath: we have frequently experienced this inconvenience personally, but have invariably found a remedy in the addition of a little strong alcohol to the collodion, and allowing a longer time for it to "set" before immersion of the plate in the bath.

In our last we took exception to the explanation proposed by that eminent French photographer, M. Davanne, of the singular phenomenon noticed by Mr. Young, in connection with collodio-albumen. In our present number we have amongst our correspondence a communication from Mr. Barber, in which attention is drawn to another point, also bearing upon the same subject, which merits consideration. Our special object in adverting to it here, however, is to protest against the assumption that the photographic image is simply metallic silver, as has been affirmed by the gentleman above alluded to, M. Davanne, in conjunction with another celebrated French photographer, M. Girard. The two last-named gentlemen have done much in the investigation of the nature and properties of the photographic image, as connected with paper positive proofs; and the report of their labours, as published by the French Photographic Society, has been perused by all scientific followers of our art with considerable satisfaction.

We have, from time to time, in these pages, given an abstract of their results, and we are by no means inclined to undervalue the importance of them. We should, however, have been better pleased if they had been more ready to acknowledge the discoveries of those who preceded them, instead of apparently ignoring facts that were established by some of our English brethren in their "report," and publishing observations as original, which were only corroborative of the conclusions of their predecessors.

Amongst all the theoretical points propounded, that of the *simply* metallic nature of the image is one which we find it impossible to acquiesce in, it not being in accordance either with some of the phenomena exhibited by certain chemical re-agents, or with the researches of our countryman and friend, Mr. Hardwich, who demonstrated most clearly and satisfactorily that the ordinary photographic image upon paper *consists of silver in combination with organic matter.*

The direct collodion positive upon glass resists, for a considerable space of time, the action of a weak solution of cyanide of potassium — this is not the case with a paper proof either sun-printed or developed. Again, if the image were formed of metallic silver only, it should be capable of amalgamating with mercury — which it is not. Now, although we do not insist upon these facts alone as absolutely conclusive against the metallic theory, they certainly are opposed to it, and that very strongly, as is also the objection suggested in our present number by Mr. Barber.

MM. Davanne and Girard are still prosecuting their researches, and doing so with care and skill. We perceive, by the official report of the last meeting of the French Photographic Society, that they have inquired into the cause of change of tone from the action of the various fixing agents usually employed, and have arrived at the conclusion that it arises from their more or less solvent action upon the size used in the manufacture of the paper, and that *a portion* of the image produced in the pressure frame being *composed of silver in combination therewith*, it is, as it were, broken up.

In proof of this supposition being correct they adduce the fact, that a positive picture subjected to the action of steam becomes reddened, in consequence of its dissolving out the starch or gelatine; but they give no reason whatever why the image should be *red*, provided nothing but metallic silver be left behind. We do not find this the case universally, or even generally, with negatives or positives on glass — why, then, should it be so upon paper? But farther — upon paper, whatever the fixing agent, the impression remaining after its action is universally *red* of some kind. Now, it may be only a coincidence possibly, but it certainly appears significant, that Mr. Hardwich has shown that gelatine, in contact with nitrate of silver, and exposed to the light, *produces an insoluble* RED *compound*, and, if we are not mistaken, the same has also been demonstrated with starch.

It appears to us, then, that there is no reason whatever for regarding the photographic image upon paper as other than a compound of silver and organic matter — nay more, we are convinced that, ere they have concluded their researches, these eminent chemists cannot fail to arrive at the same conclusion: in fact, we fancy we perceive that they have taken the first step in that direction, and are heartily glad of it; but we take the present opportunity of again putting it upon record, *that Mr. Hardwich was undeniably the first to establish the true constitution of the photographic image.*

AMONGST the many objects of interest to the microscopist, and which have excited the greatest amount of discussion relative to the true interpretation of their nature, are the various delicate lines or other elegant markings found upon the siliceous remains of some of the smaller *diatomaceæ*, an order of plants inhabiting both fresh and salt water, and which are many of them so minute as to be indistinguishable by the unassisted eye. As many thousands of these infinitesimally small organisms are frequently mounted upon a single miscroscopical slide, in a space less than a square inch in area, it is no easy matter, under the miscroscope even, to pick out some one particular specimen, the operation being very like that of "hunting for a needle in a cart-load of hay;" and if this be the case with the owner of the slide, who may be supposed to have some idea of the locality where he may first have met with his illustrious stranger, the search for it might be regarded as almost hopeless by one unacquainted with its position in the slide as well as its general aspect.

In order to obviate the difficulty, various ingenious schemes were contrived by sundry members of the Microscopical Society to register the *latitude* and *longitude*, so to speak, of any object. Many of these are perfectly efficacious, but that which presents the greatest facility as regards economy, certainty, and utility combined, is one in which photography offers the means of constructing the scale, uniformly and effectively, and for it we are indebted to the suggestion of Mr. Maltwood.

It consists in drawing accurately to scale a square composed of 2500 smaller squares (fifty in each row), each one having a siding of a quarter of an inch.

In each of these squares, figures, in the form of a fraction, are clearly written, thus $\frac{1}{1}$, $\frac{1}{2}$, $\frac{7}{9}$, $\frac{7}{10}$, $\frac{7}{11}$, &c., indicating the *longitude* and *latitude* of the square in which it is found. This mass of squares is then used as an original, to be reduced by photographic means from twelve-and-a-half inches to one inch square, and of course with the scale itself the figures are also reduced to microscopic dimensions.

By means of a stop on the microscope stage the *slide* and the *Finder* can always be made to take the same relative positions; and thus when an object is observed, the position of which it is desirable to register, we have only to replace it with the Finder, when, by looking through the instrument, the numbers indicating its position can be read off.

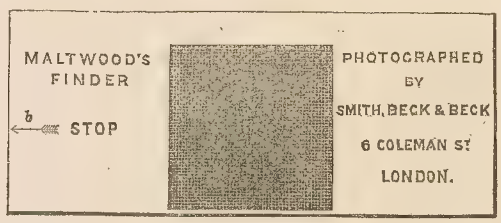
To find an object already registered, the converse of this operation takes place.

The following description of the instrument is that which Messrs. Smith, Beck, and Beck publish with it:—

MALTWOOD'S FINDER.

A "Finder," as applied to the Microscope, is the means of registering the position of any particular object in a slide, so that it may be referred to at a future time, and by any microscopist who possesses the Finder.

The subject has been fully discussed in the pages of the *Quarterly Journal of Microscopical Science*, and the best plan as yet proposed is that of Mr. Maltwood (see *Mic. Jour.* xxiii. p. 59).



It consists of a glass slide, 3 by $1\frac{1}{4}$ inches, with a scale (*a*) occupying one square inch, and consisting of 2500 squares, each of which is separately numbered with a longitude and latitude.

The scale is in each instance an exact distance from the bottom and left hand end of the glass slide, which when in use should rest upon the ledge of the stage of the microscope, and be pushed against a stop at the end; this stop, which is best as a simple pin, should be about one inch and a half from the centre of the stage, and at a point from the ledge as indicated upon the Finder at (*b*).

DIRECTIONS FOR USE.

The *object slide* must be placed under the microscope with the same care as the *Finder*, and when some particular *object* is in the field of view, remove the *object slide*, put the *Finder* in its place, and read the numbers of the square that comes in view; this may be recorded upon the *object slide*, and to refer to the same *object* at a future time, the process has only to be reversed by first finding the particular square of the *Finder*, and then by placing the *object slide* in its place.

We have taken great care to preserve an exact uniformity in the size of the scale and in its position on the slide, so that the registrations may avail any microscopist who possesses one of these Finders; we would at the same time mention that the ledges on the stages of microscopes are generally made at an angle, and when this angle varies, it may make a slight difference in the readings from the Finder, and principally on this account we have adhered to Mr. Maltwood's original size of fiftieths of an inch for the squares in the scale.

SMITH, BECK, & BECK, 6, Coleman Street, London.

May, 1859.

The experiments of MM. Monckhoven, Krafft, and others, upon the ammoniacal solution of copper, discovered by Schweitzer to be a solvent of cellulose, with a view to its application in photography, reminds us of another possible substitute. A corresponding ammoniacal solution of nickel has also been shown as a solvent of silk; but of this latter substance there is a simpler solvent readily accessible to all, and which may possibly be made available — we mean sulphuric acid. We must admit, however, that neither of them, ammonia or the acid named, are particularly desirable substances to deal with in the hands of novices. We have made no experiments in connection with the subject; we simply know the fact, that silk is soluble in sulphuric acid, and throw out the suggestion to those experimenting in this direction.

We learn from the *American Journal of Photography* that the number of members of the Photographical Society now exceeds one hundred, and as it has only been organised some four or five months as yet, we think the promoters have to be congratulated upon their success. At the fifth meeting, which took place on the 13th ult., Mr. Seely proposed the name of Mr. T. F. Hardwich for election as an honorary member, coupled with some well-deserved and graceful complimentary observations. The nomination was seconded by acclamation, and unanimously approved.

Such an act as that above recorded is regarded as a compliment by English photographers generally, and it does much to promote sympathy and good feeling. Before the close of the meeting, it was also

Resolved —"That the Corresponding Secretary be instructed to address letters of compliment to the Photographic Societies of London and Paris, assuring them of our desire to co-operate with them in the advancement of the art of photography."

In discussing the proceedings of a Foreign Society it is difficult to divest one's remarks of an appearance of national jealousy; feelings of patriotism will more or less make themselves visible when least intended. In any of the observations that we may make, we wish it to be distinctly understood that we shall endeavour to ignore nationality in photography, and adopt cosmopolitan principles. We must make remarks; we trust that they will be received only as intended — for the purpose of furthering our art.

We notice in the organ already quoted, that Dr. Draper has been making an attempt to supply that photographic desideratum, an "Actinometer," by employing for the purpose a solution of per-oxalate of iron, which, after insolation, reduces gold from a solution in direct proportion to the amount of actinic influence to which it has been subjected.

This application is the same in principle as that suggested by Mr. Fowler, of Leeds, at the meeting of the British Association for the Advancement of Science last year: a mixture of solutions of per-chloride of mercury and oxalate of ammonia were employed, which under the influence of light are converted into carbonic acid, which is set free, and photo-chloride of mercury (calomel), which falls as a white powder.

Dr. Draper's arrangement would not appear to be quite so economical as Mr. Fowler's; but if it be more certain or more sensitive, it may possibly, notwithstanding this drawback, be adopted in preference. The subject is one of great importance, and any who devote themselves to the solution of the problem deserve the thanks of photographers generally.

We perceive that the editor of *Cosmos* will persist in declaring that M. Saint Victor's statement of the property supposed by him to exist in tartaric acid of "storing up" light is incontestible, notwithstanding the startling evidence to the contrary that has been adduced—or rather, we should say, the evidence of the fallacy of the points upon which M. Saint Victor relies, for it is difficult to prove a negative. We quote the assertion:—"Tartaric acid, like nitrate of uranium, has, and it is at the present day an *incontestible fact*, the property of storing up light in its condition of activity and chemical efficacy." Such perseverance in a better cause would be invaluable; but when exerted in the promulgation of mere speculation as an ascertained fact, it is positively mischievous, and we shall not cease to utter a protest until the alleged fact can be satisfactorily proved. To quote from our predecessor, "pertinacity can only be met by the like."

EXPERIMENTS IN PARALLEL DIRECTIONS.

We have before now remarked upon the singular manner in which Mr. Hannaford has been treading in the footsteps of Mr. Burnett. It is perhaps fortunate that we happen to have been in confidential communication with both of these gentlemen, as we can testify to the *integrity of each of them as regards the other*, which we do most emphatically.

We say that Mr. Hannaford has been treading in Mr. Burnett's footsteps advisedly, because Mr. Burnett was at work long before Mr. Hannaford; and we find that the principle involved in the following process was actually communicated to us by Mr. Burnett, prior to Mr. Hannaford's so doing, but only by a few hours. In short, having carefully examined and compared our records we can positively affirm, that unless these two gentlemen had been in direct communication with one another, we do not see how it would be possible for either to have built upon the foundations laid by the other.

Instead of noticing, under the head of "New Books," a pamphlet which we received about four weeks back, we do so here, as it plays a part in the following. We must however premise, that more or less of its substance we had *previously* received in writing from the author.

Our readers may judge of our astonishment and indignation at receiving by post an imperfect copy of the pamphlet, but purporting to be written by an American, one John Brown, of New York, containing matter which we knew to be Mr. Burnett's, and couched in language and style unmistakeably his. This turned out to be Mr. Burnett's own doing, for a reason we may touch upon in a future number. For the present we will be content to give the preface to the pamphlet, then a paper of Mr. Hannaford's, and thirdly, a letter from the same gentleman — all being full of interest.

Photographic Negative Processes on Waxed and Plain Papers and on Glass. Specimen—Formulæ, and Remarks, by C. J. Burnett. London: John Sanford, 18, Red Lion Square. Edinburgh: Colin Sinclair, 69, George Street.

PREFACE.

The processes described in this pamphlet are founded on a variety of investigations and experiments made in 1854, and at intervals up to last winter. The first copies were struck off in a hurry, but it has now been revised, and some remarks, which in the hurry of abridgement had been cut short or misplaced, have been inserted in their proper places.

To prevent misunderstanding as to the nature of the processes, I will here roughly and broadly state (without going farther than photographers will care for) some of the outside principles on which my attempts at improvement are based —

1. That our sensitive papers [or films?] must contain at once two different classes of silver compounds; the first class being a compound of silver itself with iodine, bromine, or chlorine; and the second class being either silver-oxide or a compound of it with some acid—this latter class being, in our ordinary papers, represented by the nitrate of silver-oxide, commonly for briefness called nitrate of silver.

2. That while the salt employed to form our sensitising bath must necessarily and of course be a soluble one like the nitrate, it is by no means essential that the salt of the same (*i.e.* the second) class, to be left in the paper or films when ready for exposure, should be a soluble one, any more than that the iodide of silver or other salt of the first class should be soluble; but on the contrary, it is on many grounds infinitely better that it also should be an insoluble one.

3. That this desired substitution of the insoluble salt of silver-oxide for the soluble one is readily attainable by associating with the alkaline (or cadmic) iodide used in paper or film-salting the soluble salt of some acid whose compound with silver-oxide is an insoluble one, then after sensitising as usual, washing away the free nitrate (along with the soluble decomposition-products), so as to leave in the paper when ready nothing but silver-iodide and silver-bromide in combination with the tartrate, *oxalate, phosphate, fumarate,* or other insoluble salt of silver-oxide. Formula 2 is especially recommended, because the oxalate of ammonia is in most places kept for sale, and because, in default of fumaric acid or one of its salts, the oxalate of silver-oxide shares to a considerable extent the valuable property possessed by the fumarate (and phosphate) of insolubility in other organic acids; so that should we wish to add a little citric, tartaric, or acetic acid to our nitrate of silver bath, or to the washing water, or to the water used in remoistening before exposure, or to a solution of gallic acid or other reducing agent used in super-sensitising, we can do so without dissolving out or setting adrift any portion of the silver-oxide contained in the paper. The addition of a little acid (citric, tartaric, acetic, malic, or one of their *bi*-salts), to the *last* of the waters used in washing, seems advisable as tending to make the papers keep better, the previous waters having removed, along with the other soluble matters, any acid which had been taken upon from the sensitising bath. While alluding, in passing, to experiments with neutral and alkaline baths, it must be distinctly understood that I do not warrant my processes to succeed without, or with less than, the full usual quantity of acetic acid, or a *corresponding* quantity of the other acids named, either in the silver bath or in the last washing water, or in both, as well as in the developing baths or solutions.*

Edinburgh, 16*th June*, 1859.

SENSITIVE DRY COLLODION PROCESS.

By Michael Hannaford.

By the following manipulation extremely sensitive dry or preserved plates may be produced.

Make a saturated solution of chloride of ammonium, or chloride of sodium, and filter. Common table salt is quite pure enough for the purpose; or take citric acid, a quarter of a pound dissolved in half a pint of water, and add carbonate of soda until the solution is neutralised. Either of these may best be used as a dipping bath.

If great sensitiveness is the object, both the nitrate of silver bath and the collodion should be the same as will produce the quickest effects in the wet process — neutral bath and new collodion.

Sensitise in the usual way, and *slightly* wash — say, for a stereoscopic plate pour on a quarter of an ounce of water, and gently agitate until greasiness disappears. Well drain, and immerse in the chloride or citrate bath. After a minute or two remove, and wash with a large quantity of water. All the free soluble nitrate of silver is now converted into insoluble chloride or citrate, as the case may be. Any of the preservative solutions may now be employed: washed albumen, gum, or gelatine, &c., for dry plates; and honey or oxymel for preserved plates. I prefer the last two named.

The developer may be either gallic acid, pyrogallic acid, or iron. With some samples of collodion, particularly if new, a difficulty may be experienced in gaining intensity. I usually push the development as far as I well can, then fix with hyposulphite of soda, after which there will be found much less difficulty in getting the desired depth. With collodions commonly employed in the dry processes this inconvenience does not occur, especially when using the citrate bath.

Instead of converting the free nitrate of silver into chloride or citrate, it may be precipitated as bromide, acetate, oxalate, &c., but the above is the process in its simplest form.

I find that within a given time as nearly as possible the same number of plates may be prepared as by the Fothergill process.

London, 7th July, 1859.

Dear Sir,—I sent you this morning a short account of the preservative process I promised. It is, as you will see, the same in principle as I gave you at the meeting of the North London. I have said little or nothing of its comparative sensitiveness, for I am engaged in a series of experiments to ascertain that. I used citrate of soda to precipitate the free silver some time before anything had been said about mixing a chloride with albumen in Fothergill's process, but I never tried any other salt before then. The citrate is my favourite bath, but the chloride is cheaper and more easily made. The chief advantage I consider I have derived is, that I can get such sensitive plates by the use of oxymel, and that honey plates will keep so much better than when there is free nitrate. I have not, however, had so much practice with the honey as with oxymel.

You say that my experiments run very parallel with those of Mr. Burnett again.

I have been looking over his recent communications to you, and can only find a hint in the last number of the Journal, that he purposes giving some information on the use of insoluble salts of silver in the way I name, both on glass and *paper*. The same principle applied to paper would naturally suggest itself, and I have been experimenting in that direction with some promising results: so I shall look forward to Mr. B's communication with interest.

The idea of precipitating the free nitrate on paper prepared for positive printing, which perhaps you may remember I suggested to you at the last meeting of the North London Association, appears also to have struck him. You thought that the result would not compensate for the extra trouble. I have not had time to put the suggestion to any test, but I think it very likely you may be correct. The papers, however, might keep better. I shall try it.

The editor of a contemporary purposes giving us an instantaneous dry process. I have prepared my bath and collodion for it, and have only to get the palladium to commence; for there can be but little difficulty in guessing what it is, viz.—collodion (alcoholic of course), to contain two parts of an iodide and one of a bromide; bath acidified by nitric acid; developer, protosulphate and protonitrate of iron, with nitric acid; the resulting picture to be very weak, but full of detail; and intensity to be given by palladium. There is, I think, sufficient that is promising in it to make it worth a trial. I shall employ honey or oxymel for the preservative, which Mr. —— will *not* do.

I have been trying some experiments with a view to engraving on copper and steel, and the result is more than promising and very interesting.

I have to thank you for your information respecting the preparation of honey syrup, and am, yours truly, MICHAEL HANNAFORD.

ON THE ACTION OF POTASH ON GUN-COTTON.

By Edward Ash Hadow,

Demonstrator of Chemistry in King's College, London.

[In consequence of the interest attaching to the remarks made by Mr. Williams, at a recent meeting of the Photographic Society, relative to the presence of oxalic acid in collodion, Mr. Hadow, whose valuable researches upon gun-cotton, published in one of the early numbers of the *Journal of the Photographic Society*, are universally regarded as the "base of operations" for those engaged in similar investigations, has kindly acceded to our request of recording the following important facts from his own personal experience: —]

I made a few experiments some time ago on the action of potash on gun cotton, but I am sorry to say that they were at the time but imperfect, nor have I since continued them; but such as they were I have now much pleasure in communicating them.

Gun-cotton, as is well known, dissolves perfectly in a strong solution of potash, and the resulting liquid was applied some years ago by M. Vohl to the silvering of glass. This operation was effected by adding a little nitrate of silver to the potash solution, then enough ammonia to redissolve the precipitated oxide, and afterwards gently warming the liquid, when a mirror-like deposit of metallic silver takes place on the sides of the vessel in which the experiment is performed. It was partly from this property of the potash solution, and partly from a hope of getting an insight into the state of combination in which nitrogen exists in gun-cotton, that I felt the subject to be interesting. In a concentrated *aqueous* solution of potash at ordinary temperatures, gun-cotton dissolves slowly, but rapidly at 150°, the temperature then rising with each addition of fresh gun-cotton, and soon attaining the boiling point. With an *alcoholic* solution of potash the gun-cotton dissolves rapidly at ordinary temperatures, the solution separating into two layers, a pale alcoholic one above and a dark treacly layer below; in both cases a smell of ammonia may be plainly perceived, though the quantity is really very small.

* To any one having the slightest acquaintance with chemistry, it must be sufficiently obvious that the *introduction* of the *neutral* salts of the vegetable or other acids is not intended to supersede the ordinary addition of a free acid as employed to make the paper keep or to keep the pictures clean; still, for the benefit of those who ignore chemistry, it would appear to be necessary to be thus explicit.

On supersaturating the solution of gun-cotton in aqueous potash, or the upper layer of the alcoholic potash solution, with acetic acid, and testing a portion with a protosalt of iron, an intense blackening of the liquid occurs, showing that *nitrites* are present, and after expelling nitr*ous* acid by boiling with acetic acid, the liquid is found to contain nitr*ic* acid. Supposing gun-cotton to contain NO_4, this reaction with potash may be thus explained:—

$$2NO_4 + 2KO = KONO_5 + KONO_3.$$

When an alcoholic solution of potash is used, these two salts being soluble in alcohol, are present in the upper layer and crystallise out after a time.

The elements of the cotton exist in the liquid in the form of an acid, in combination with potash, and this compound being insoluble in alcohol, forms the dark layer which separates when alcoholic potash is used.

To isolate this acid the potash solution was neutralised with acetic acid, and mixed with a solution of acetate of lead. An abundant precipitate was thus formed, which was collected on a filter and well washed. It consisted of the acid in combination with oxide of lead, which latter was removed by diffusing the precipitate through water and transmitting sulphureted hydrogen. The lead being thus separated as sulphuret, was removed by filtering, and the filtered liquid, of a pale yellow, contained the peculiar acid to which the reducing action of the potash solution of gun-cotton appears to be due.

Several attempts were made to obtain crystallisable salts with this acid, but without success. With the ammonia salt indeed there appeared to be a promise of success, for after putting aside the solution for some days prismatic crystals made their appearance; but these on examination proved to be oxalate of ammonia, and after separating them only gummy masses could be obtained. Oxalic acid having thus been found in the liquid, it was removed, and the purified acid solution was set aside for some months in a bottle, labelled "free from oxalic acid." At the end of that time, however, when re-examined, *abundance of oxalic acid was found*, thus showing the strong tendency that this peculiar acid has to change into oxalic acid. The original solution of gun-cotton in potash also contains a portion of oxalic acid.

The unnamed acid above referred to presents some resemblance to saccharic acid, both in its relation to oxalic acid and in some of its re-actions; for, as saccharic acid is an intermediate compound between *sugar* and the ultimate product of its oxidation, oxalic acid, so the new acid is intermediate between *cotton* and the oxalic acid which is finally produced by oxidating influences upon it.

The sources, sugar and cotton, are closely similar in chemical composition, and the two acids resemble each other in their property of reducing salts of silver to mirror-like deposits, and in precipitating salts of baryta, lime, and cadmium; the crystallisability of the saccharates however presents a marked difference between the two.

These experiments were made with the most explosive variety of gun-cotton. How far the other varieties of gun-cotton would yield similar products with potash depends upon the degree to which the NO_4 in these compounds is concerned in producing the *reducing* acid with the elements of cotton. If, as appears probable, the weakest variety of gun-cotton contains sufficient NO_4 to form the acid with the elements of cotton, all the varieties of gun-cotton would yield the same products with potash, the only difference being in the amount of nitrite and nitrate formed at the same time. Upon this point I am unable to speak from actual experiment.

METHOD OF OBTAINING PURE WHITES IN DIRECT POSITIVES.

By MM. Davanne and Jöuet.

Direct positives do not always exhibit the pure silvery white that operators desire; the colour being often ashy or ochreous, to the great detriment of the picture. In some experiments we have obtained proofs which appeared more brilliant than most of those generally seen. Our process, however, can boast of nothing new: it consists in the addition of a certain quantity of sulphuric acid to the iron developer, which enters into a host of formulæ already given; and if we have had better results, it is due to our employing, instead of an empirical formula, one based upon the elementary laws of chemistry.

To obtain a brilliant metallic white, it is necessary that the molecules of silver, which are deposited and form the image, be as pure as possible; we must, therefore, inquire what takes place when we develope a picture.

The oxide of silver in the nitrate is decomposed by the sulphate of the protoxide of iron, and while the silver is reduced to the metallic state, the sulphate of the protoxide passes to the state of sulphate of peroxide. But the sulphate of the peroxide of iron thus formed is basic and insoluble: it envelopes, as it were, the molecules of silver deposited at the same time with it, and communicates to the silver an ochreous tint. Instead of the insoluble basic peroxide of iron we ought to obtain the neutral sulphate, which is soluble in water; but this is formed only when we add to the iron solution a certain quantity of sulphuric acid. The quantity necessary to produce a brilliant silver is easily determined by the following formula, which exhibits all the phases of the operation:—

$$2\,Fe\,O,\,S\,O_3 + Ag\,O,\,N\,O^5 = Ag + N\,O^5 + Fe^2\,O^3,\,2\,S\,O_3.$$

The composition of the soluble sulphate of peroxide of iron being $Fe^2\,O^3,\,3\,S\,O_3$, we see that we must add one equivalent of sulphuric acid for two equivalents of sulphate of protoxide of iron, or in weight 6.12 gr. of sulphuric acid for 26.87 gr. of crystallised sulphate of protoxide of iron.

In practice, and to have round numbers, we may say in general terms that the quantity of sulphuric acid must be equal to one-fourth of the weight of sulphate of protoxide of iron. The following formula may be given:—

Water	12	ounces.
Alcohol	5	"
Acetic acid	5	"
Sulphate of protoxide of iron, in crystals	4	"
Sulphuric acid (by weight)	1	ounce, or

By measure, 0.58 ounce.

GOLD TONING BATH MERITING FURTHER TRIAL.

By C. J. Burnett.

Make a good strong terchloride of gold bath, and then add to it first common salt, five to ten grains per ounce, and then carbonate of soda first till litmus paper is turned blue, and then, if wished, as much more again. The chloride of sodium prevents precipitation of gold, even when kept long. Carbonate of potash may be substituted for soda, and chloride of potassium or bromide of potassium (or fluoride ?) for common salt. Iodo-aurate and bromo-aurate of potassium are reduced by silver, and appear not unlikely to be useful in toning. The latter at all events is safe enough. The solutions of gold in cyanides, ferro-cyanides, and ferrid-cyanides, and their allies also merit a trial; also similar solutions of platinum and palladium.

I recommend the substitution of the double chloro-aurate or bromo-aurate of sodium or potassium for the terchloride of gold, as being nondeliquescent, a great point of convenience as to keeping and weighing.

It is an ascertained fact that chloride of sodium has an affinity for the *aurate of soda* which is formed of the free alkali, and that its presence in the bath in *considerable* quantity is therefore advantageous in preventing precipitation of gold or auric oxide. I can only add that if any one will try the experiment, I think he will be satisfied that the fact is as I have stated. I believe that even a LARGER quantity than I gave you of chloride of sodium may be of advantage, lessening still further the liability to *spontaneous* precipitation of gold.

POSITIVE PRINTING WITHOUT SALTS OF SILVER.

By M. Poitevin.

Light acts chemically upon a great many compounds, even upon those which have not yet been the subject of experiment, to make them pass into a lower state of oxidation, that is to say, to eliminate one of the electro-negative elements they contain.

This paper will be confined to describing a photographic process resulting from the action indicated, which enables us to obtain positive proofs upon paper in which gallate of iron (writing ink) is the only colouring agent.

Make two separate solutions, the one of perchloride of iron, ten grains to one hundred of water; the other of nitrate of uranium, of the same strength (10 per cent.), mix the two solutions in equal proportions. Take some good thin photographic paper and float it on the smoothest side for a few seconds upon water. When drained,

lay the dry side upon a glass plate or piece of wood, the dimensions of which are a little less than those of the paper, then cover the moistened surface equally with the mixed solutions, and pour off the excess into a bottle. The mixture may be kept several days in a black bottle without alteration.

The paper thus prepared is dried spontaneously in a dark place. It appears of a deep yellow colour. It must be put into a printing-frame under the design it is desired to produce. This design must be *positive*, for the parts of the paper thus prepared influenced by light are white. A waxed positive may also be employed. The exposure under a positive *cliché* is from fifteen to twenty minutes in the sunshine, it varies according to the intensity of the *cliché;* the necessary amount of exposure can be estimated by the colour of the prepared paper, the intense yellow of which becomes white under the influence of light; this decolouration must penetrate the paper. The decoloured portion is formed of perchloride of iron brought to the state of protochloride, which does not become coloured under the influence of the gallic acid employed for developing the picture.

To obtain the design in black, moisten the paper with water as in the previous instance, let it drain, then lay it on a glass plate or piece of wood, and pour over it a saturated solution of gallic acid, or of pyrogallic acid of the strength of two per cent., or even a concentrated infusion of nut galls will serve.

The gallic acid gives a violet colour to those parts of the image in which the perchloride of iron is not decomposed.

Pyrogalic acid gives a lead-grey colour to the same.

A mixture of these two acids gives an intermediate colour which may be varied by altering the proportions of each.

To fix the proof, it is washed in ordinary water renewed once or twice, then sponge the surface and leave it to dry. The colour becomes more intense in drying. Proofs thus obtained are as unchangeable in the atmosphere as ordinary writing; the materials are inexpensive.

The process is therefore cheap and safe.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

Upon one of those warm sunny days which, during the ides of March, deluded us with the idea that spring has stolen a march upon winter, I found myself seated at a little table outside a *café* in the *Boulevard Italien*, sipping a miserable compound of Martinique coffee and chicory, which is extolled as a model for imitation to the barbarians across the channel. I was deep in study in the *feuilleton* of *La Presse*, and just beginning to unravel the thread of the mystery of a tale, when a heavy hand fell upon my shoulder with a weight and a grip that I knew could only be inflicted by a Lancashire man. "Halloa, parson! I want you; going across the desert, and you must come too: I want you to take Jerusalem and Damascus, so pack up your traps and come along!" Such an address awoke in my mind a strange confusion of ideas. Desert! Jerusalem! Traps! I looked up and saw the broad honest face of my college chum, Weston.

John Weston is in every sense of the word a strong man: strong in his Herculean frame, strong in will, firm of purpose. Whatever John says you feel must and will be done. I saw at once that I must cross the desert with him; and, had the next day been fixed for my wedding, it must have been postponed, for John is one that takes no denial, so I meekly replied: "When do you go? When must I be ready?" "To-morrow. To-day if you like, so look alive!" I had only to say, very well, and then bethink me of what was necessary to be done before starting. John informed that I was to consider only my own *personne*, that he would provide all things needful for the offensive and defensive, revolvers included; so having despatched a note to my *blanchisseuse*, I proceeded at once to provide myself with a good supply of waxed-paper and the requisite chemicals. Taking a bellows-camera, my whole photographic baggage was comprised within the compass of an ordinary writing desk, and before sunset I was in complete marching order. At six o'clock next morning we were on the Lyons railway, *en route* for Marseilles. I said *we*, but I have not yet said who *we* were. Besides John and myself, already mentioned, our party consisted of an American gentleman and lady, who, acquainted with John, and having unlimited confidence in his valour and resources, had placed themselves under his guidance and protection.

I had always looked up to John: a brave, hearty fellow, who seemed born to protect the weak, to conquer difficulties, and overcome menacing dangers. I do not think I would have trusted myself on so perilous a journey in any other person's company than his, for I felt sure that whatever scrapes we might fall into he would get us safely out of them; and, as I have no doubt will be shown in the sequel, my confidence was not misplaced.

As each member of our party studied to be agreeable to the other, our journey was as pleasant as could well be imagined; but as nothing of more than ordinary interest occurred, I shall at once jump to our arrival at Gaza. I must not, however, omit to remark that as I was strolling through the streets of Marseilles, I stopped before the shop window of a bookseller, and there to my great surprise and delight I saw a copy of The Photographic Journal, dated March 15th. It was like meeting an old friend. I walked into the shop, and entering into conversation with the *libraire*, I found he was an amateur photographer. Bringing forth his portfolio, he showed me many interesting views he had taken of the public buildings, Roman antiquities, &c., of his city. He was a subscriber to your Journal and to some others, but he gave unhesitatingly his preference to yours, for, as he said, he was sure to find in it *la science* and always *du nouveau*. * * * * * * * * *

Well, here I am encamped on the plain that lies between Gaza and El Arish, in a hollow, from whence, all night long, I can hear the heavy *thud* of the surf on the shore, beating that solemn, steadfast time-beat that has shaken the desert hills for who knows how many thousand years. It is dawn; the morn is coming up like a giant refreshed. There is a glow in the horizon, succeeded by a burst of splendour, and up in the sky soars the golden sun, monarch of all he surveys. Swiftly shrink the long shadows of the sand-hills into dark spots in hollows, and soon a rich light, such a light as can be felt, lay upon all the desert.

In such scenes as this how the whole man expands! You seem to grow with every breath you inhale. All the past is yours, you feel yourself its representative, its living embodiment. And yet you feel humble withal: humbled at the reflection, which on such a spot as this becomes a sad conviction, that indeed all is vanity.

This is the fourteenth day since we left Cairo. My outward man is changed into something more in harmony with the scene around me, and I feel the inner man changing too, more than I could have dreamed. I feel myself insensibly acquiring the tone and manners of the strangers whose land I have invaded. Collodion and hypo' seem strangely out of place here, and I could not help smiling when one day I suddenly found myself in front of a camera, planted by an enterprising Frenchman in the streets of Cairo.

But I was describing the morning on the desert. It will soon be left in our rear, for little hills and occasional groves of olive trees and the prickly pear are in view. We are passing the line of no rain! and entering the country where occasional showers insure a certain though feeble vegetation.

I am in the land of the Philistines. Before me is Gaza. How often, when a child, had I pictured to myself a giant striding up the hills on the east, on a dark night, bearing on his shoulders the rent gates of the city! But this I see is a modern city, with some five thousand inhabitants. "Gaza shall be forsaken." The mighty are fallen. Sampson is dust: the temple he threw down with the last struggle of his mighty soul is crumbled to ruin, and flowers grow and bees suck honey in the dust that was stronger than the lion of his own fable.

The sun was setting in the Mediterranean as we approached Gaza. John rode on in advance to select a spot for the tents, and I followed leisurely with the baggage. We form something of a caravan with our six horses and a file of half-a-dozen camels carrying tents, &c. About a dozen Bedouins flutter round us as escort, watching for *baksheesh* or plunder.

Our tented field was a burial ground, a fitting and curious place to sleep. At home I have no fear of ghosts, but who could sleep in a Moslem cemetery believing that the dead would lie quietly? I lay awake looking for them all night long, and so positive was I that I should see a ghost, that when Sheikh Selim lifted the tent curtain in the morning dawn, and put his thin, gaunt countenance and skinny hand into the opening, I rushed at him, to his total rout and overthrow, for he thought he had intruded, and sprung back to avoid an expected blow, stumbling over the cook, who was on his hands and knees blowing at his breakfast fire, and Selim, the cook, and the breakfast made a mass of ruin on the ground that resembled, though remotely, the ruins of Gaza.

So soon as my cook had recovered his equanimity, after this inglorious overthrow, to concoct his usual preparation of coffee and accessories, I made my breakfast, not without comparing the decoction of the Arabian berry with its poor substitute on the Boulevards. It is melancholy to reflect how many thousands of Europeans

go to their graves without having tasted in perfection—coffee! That bitter, mawkish, insipid decoction of chicory and beans so constantly foisted upon the ignorant for the fragrant berry, is no more to be compared to the latter than is champagne to toast and water. Coffee cannot be made and drunk too quickly; every moment it stands letting off its fragrant steam it loses its virtue, the true spirit evaporates, and what is left is but a *caput mortuum.*

I could fill many pages with the praises of coffee, of the coffee of the barbarians, not that of civilisation. No matter how exhausted or weary I feel in my travels, give me but a cup of the true Eastern beverage, and in a few moments "Richard's himself again!" Its restorative power on an exhausted frame is truly marvellous; but then it must be the pure, freshly-prepared infusion.

But here I sit dreamily gazing at Gaza, and John will want to take Gaza away with him, so I must needs plant my camera and set to work. About the modern city the ruins of the ancient lie engulphed around in broken columns and fragments of capitals, architraves, and friezes, all appropriated to the vilest uses. The mosques of the city are mostly built of the stone of the old ruins, and the muezzein calls the faithful to prayer within walls which have echoed the praises of Dagon. Half a mile away the hoarse surf thunders a mocking triumph over the decay of the grandeur of the oldest of cities: the stillness of its port, the wreck of its harbour, the absence of its merchants. How solemn the scene, now so desolate and lonesome, contrasted with what the mind conjures up when the port was crowded with its galleys and thronged with princes and merchants!

It was towards the cool of the evening that I took my first picture in Holy Land. The declining sun tinged with a golden hue all the features of the scene; the shadows were deep but not dark, giving a relief to objects such as I had never seen before. I brought away with me the forms of things it is true, but how I sighed for the magic colours that illumined the picture, no tongue but my own can tell. D. T.

Meetings of Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

A MEETING of the above Society was held on the 20th ult.; the President, J. GLASHIER, Esq., F.R.S., in the chair.

After the usual business had been transacted, Messrs. Henry Kent, Newton Crossland, Thomas Skaife, and William Kieser, were duly elected members of the Society.

Mr. HEISCH exhibited two dry plates, one prepared by Hill Norris, the other by himself by the meta-gelatine process; both had been kept so long, that a dirty deposit formed during development. On the plate prepared by himself this was entirely removed by gentle friction with a pad of wet cotton; on attempting to do the same with Norris's plate, the whole picture came off in powder; but the point to which he called the attention of the Society was this, that the glass was still entirely covered with a transparent film. This film resisted the action of a mixture of ether and alcohol, but was removed at once by hot water; it was apparently a coat of gelatine. The question is, does Dr. Norris coat his plates with gelatine before collodionising, as has been lately so much recommended, or is his collodion so powdery as to let enough gelatine through to form this film? Mr. H thought the former supposition much the most probable. Mr. H also exhibited one of Derogy's lenses and the pictures taken with it, which were of the most satisfactory description.

Mr. T. R. WHEELER delivered a short paper upon Monckhoven's cellulose process, as recently employed by him; and exhibited a picture taken by it, as well as some prints from that picture. He adverted to the discovery by Schweitzer, of Zurich, that cotton and silk were soluble in cupro-ammonium, and to that of Pelouze as to the solubility of cotton in concentrated hydrochloric acid, and to the application of that discovery by Peligot, while Monckhoven, of Ghent, had collated what was previously known on the subject, so that the process was not unfairly named "Monckhoven's Process."

The author stated that the object of the several methods in which the ammoniacal solution of copper is employed is the same, viz.—to obtain the solution of oxide of copper in ammonia. Monckhoven's plan was to throw down hydrated oxide of copper from commercial sulphate by liquor potassæ, and dissolve it thus obtained in liquor ammoniæ. Peligot's plan amounted to the same thing, and was the one he (the author) employed.

It consisted in placing copper turnings in a funnel in which some pounded glass was put, and pouring liquid ammonia upon it. The air oxidised the copper, and the ammonia dissolved it as fast as formed. The solution, which should be passed and repassed through the copper turnings that it may be saturated with oxide of copper, is allowed to stand, that all impurities may subside, and is then decanted. Carded cotton is then introduced in the proportion of about two parts to every twenty of the solution; it readily forms a viscid solution, and that being complete, it is ready for use. Iodide of potassium is added, dissolved in water in the proportion of about two grains and a half to the ounce.

If well prepared, it is perfectly transparent, of a deep blue colour, and flows readily upon the surface of glass.

When employed as a photographic medium it is poured as a film like collodion, and allowed like it to set partially, which is known by a whitish opalescent margin appearing; this occurs, of course, at varying intervals, on account of the varying state of the temperature and its hygrometric condition, but an average time is half a minute; it is then immersed in a bath consisting of water one hundred parts; nitrate of silver, ten parts; acetic acid (glacial) five parts. A few seconds' immersion is sufficient. The surface of the film whitens, and should have a homogeneous texture. It is then exposed in the usual way, and, according to the author's experiments, requires rather a longer exposure than collodion, say thirty seconds. It is then developed. For this the author used—pyrogallic acid, one grain and a half; water, one ounce; acetic acid, ten minims; then washed and fixed with hyposulphite of soda. The picture obtained is in many respects a good one, and the process, generally speaking, one of much promise.

The advantages to be enumerated are, its great cheapness, its facility, its uniformity of composition, and the fact that commercial nitrate of silver may be employed for the bath; also its remaining moist in very hot weather, and that it may be kept in the air many seconds before immersion. It must not, however, be kept too long before immersion in the bath, or the ammonia volatilises. The principal disadvantage of the process—and it is that with which the author had mainly to contend with—is that the film is liable to become detached when immersed in the nitrate bath. It remains to be shown why this so frequently, and apparently so capriciously, occurs; the author believes it to be due to the energetic chemical action which takes place between the ammonia of the cotton solution and the acetic acid of the bath, which is required to be in excess to dissolve oxide of copper. He intends making experiments on the subject with a hope of obviating the difficulty, as also to employ the "cellulose" in a dry process. With respect to failure, those accustomed to chemical manipulations will easily understand how hard it is to pronounce wherein it lies, since much disappointment must be encountered, and much inductive experiment, used before success is attained. What becomes of the copper? The author believes that it, with the cotton in solution, acts as a base to a radicle in the first instance, and that the excess is removed by the acetic acid in the form of a diacetate. The author apologised for the hasty and imperfect manner in which his remarks were conveyed, but hoped to renew the subject with more effect and better success during the ensuing session.

At the conclusion a vote of thanks was tendered to Mr. Wheeler and the meeting separated.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.—In our advertising columns will be found the list of prizes for photographs and for original communications to the Society, to be given during the forthcoming Session of 1859-60. We shall for the present simply direct attention to the advertisement.

DR. HILL NORRIS'S DRY PLATES.—A few day ago some plates were sent to an eminent Liverpool photographer with a request that they should be exposed two seconds. The writer saw two plates developed in three minutes that had been exposed on Tuesday evening last, at seven o'clock, five seconds—stereo., six-inch focus—and they were considerably overdone. This is a fact of the very highest possible importance to the photographic art, as instantaneous impressions on dry plates have been hitherto a great desideratum. Photographers owe Dr. Hill Norris a debt of gratitune already; and, should he publish his process, as he has done heretofore, he will confer a lasting obligation upon all connected with our art. The writer has lately been operating with gelatine and honey, and finds great acceleration; and he would earnestly advise his brother photographers to try in this direction, should Dr. Norris not favour us with his process.—*Communicated.*

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER III. (*Continued*).

ON COLOURS AS PIGMENTS.

OF RED PIGMENTS.

Red stands pre-eminent among pigments for power—is more nearly allied to the advancing than the retiring colours. Its effect is so great upon neighbouring hues and tints as to demand the exercise of the utmost skill in its use; it boldly challenges the two extremes of black and white to diminish its beauty; and never fails to convey to the mind sentiments associated with splendour and brilliancy. We have numerous red pigments.

Lakes—A variety of beautiful colours bear this name: they are prepared from several substances, viz.—Brazil wood, cochineal, lac, and the root of the madder plant, which last alone is permanent.

Crimson lake is of a rich deep colour and very fugitive; the *Scarlet lake* the same.

The lakes prepared from the madder plant are very beautiful, and are most commonly used for oil and water, although they have not sufficient power to serve all the painter's purposes.

Madder pink and *madder lake* are pigments of nearly the same character.

Carmine—A very beautiful colour, but very fugitive; works well in oil or in water.

Madder carmine—A beautiful and durable colour for water or oil.

Indian lake—The best member of the lake family, but not the most beautiful.

Vermilion—A very useful and beautiful pigment; works better in oil than in water, but is used for both; is opaque, of good body, and very brilliant. A *pure* preparation of this colour is, I believe, permanent, but it is very frequently contaminated by mixture. It is a sulphuret of mercury. The vermilions called scarlet and orange are best for water; that known by the name of *iodine* is not to be depended on for either, although of wondrous beauty.

Light and *Venetian reds*—Very valuable either for oil or water, and are quite permament; the former is burnt brown ochre, the latter a preparation of iron.

Indian red—A very rich iron ore, of a lakey tone, generally used both for oil and water, of good body, works well, and is perfectly permanent. It varies in hue but not to any important extent.

OF BLUE PIGMENTS.

Blue, among the primaries, represents shade, being by its qualities most nearly allied to black; it is representative of coldness, and contributes its characteristics to all its compounds. Blue pigments are not very numerous.

Ultramarine—A very brilliant permanent blue, nearly opaque, prepared from the lapis lazuli of Persia; it is not much used in consequence of its high price; its tints are very pure, its permanency undoubted; it works well in oil, but is managed with much difficulty in water, in which case a *little* gum* is usually added to it. For compounding hues ultramarine is unsurpassed, but all these qualities depend upon its purity, and, alas! like most other things it is too commonly adulterated. You may test it, however, thus: add a little piece of the pigment to lemon juice, when, if it be pure, its colour is instantly destroyed. There are several imitations of this colour prepared and sold at a very cheap rate; the most celebrated is called *French ultramarine*, which approaches the original in beauty and permanency; the acid test produces the same effect upon this blue as upon the original ultramarine, but *with effervescence.*

Cobalt approaches in brilliancy true ultramarine, but has less power; it is of good body, works well in water and oil, is nearly permanent when carefully prepared, and very pure, being neither greenish nor purplish; its greatest foe is impure air. (Blues called *smalt mineral* and *royal* are all cobalts). It is prepared with metallic cobalt or its oxides. Of these blues the "royal" is least permanent.

Prussian blue—A bright, deep, and very transparent blue, of great body and power, but not very pure or permanent; useful in water and oil, but liable to be destroyed by lime and alkalies; a capital colour with which to compound greens. A lighter preparation of this colour is called *Antwerp blue*. Prussian blue is produced by combining hydrocyanic acid, iron, and alumina.

Indigo—Prepared from plants in the Indies; not bright, but extremely transparent and powerful, of good body, and working well in oil and water; its durability has been disputed, but it is now generally called "fugitive." A preparation of indigo, called *Intense blue*, is the better pigment. Indigo is very generally used by painters of every description.

* Too much will destroy its brilliancy.

OF GREEN PIGMENTS.

A colour so common in nature, so refreshing to the eye, and so well beloved as to command the most frequent use for domestic and decorative purposes, is of all colours the most dangerous to a picture. Place a "green picture" beside a painting glowingly brilliant with the rich hues and colours of the warm scale, and we at once perceive this fact. The one *demands* notice, excites pleasurable sensations, and conveys a power which *commands* admiration; the other seems poor and mean in its unobstrusive and retiring nature, and all the attracting power it has is fiercely ravished from it by its powerful rival. It is only when the glowing hues which attracted each spectator's eager glance begin to weary the excited retina, that the beauty and utility of the calm and quiet "green picture" reaches the eye with all its cooling and soothing power and then acknowledged beauty, thus proving the importance of what artists denominate the balance of colour. We have a very large number and variety of green pigments, but greens are so frequently compounded by the artist that but few are on demand.

Emerald green—Metallic: the most bright and powerful of its tribe, and the most permanent; it works better in water than in oil; is too brilliant for common purposes, and is generally nsed for drapery and jewellery.

Hooker's greens—Bright but not quite permanent; very useful in water.

Verdigris—Acetate of copper: very fugitive in water but tolerably permanent in oil, especially if preserved from impure air and damp.

Terre-verte—A bluish-green earth, not very beautiful but very permanent; is never used in wter, but is a most useful pigment in oil.

Chrome green—A pigment compounded from chrome yellow, used in water with gum; not very powerful but quite permanent, works well in oil.

Olive green—A compound pigment eligible for oil or water; useful for backgrounds, &c.

[The following may act as a caution to professional photographers to be on their guard against a surreptitious use of their negatives, a proceeding that may involve them in very awkward predicaments. Negatives not in actual use had better be kept under lock and key.]

A Photographer's Assistant Charged with Embezzlement.—On Saturday, the 2nd instant, at the Liverpool Police Court, Bennett Lowe, a gentlemanly-dressed young man, was charged with having stolen photographic chemicals and prints, belonging to Mr. Keith, of Castle Street. Mr. Bluck appeared for the defence. The prosecutor said that he engaged the prisoner in October last, and treated him as a confidential servant, in which capacity he had access to the whole of the stock. Witness had frequently complained of the quantity of material which was used, and having on the previous day received a letter from a gentleman in Manchester, who stated that he had frequently purchased collodion from Mr. Lowe, as well as twenty-three photographs, he caused Lowe to be apprehended. He went down to Manchester and recognised the pictures, which he believed to have been made in his time and with his material. Witness was placed in a very peculiar position with regard to these pictures. The prisoner had the negatives in his care, and could therefore print as many as he liked. A great many gentlemen who came to sit for their likenesses would object to have them exposed; but when he went down to Manchester he found three or four of his pictures which he would not have dared to exhibit in Liverpool. He also found some photographs of Mr. Walter's paintings, which he was bound by contract not to sell or give away, except to Mr. Walters himself, who of course had a copyright. In reply to Mr. Bluck, Mr. Keith said he paid the prisoner 30s. a week. He did not think he had opportunities of doing them himself, and did not know whether Mr. Walters had given him the prints of the pictures. He could not swear to the collodion which was sold to Mr. Johnson, of Manchester, but he could swear to the bottle in which it was sold. The prisoner had left the witness's employ about six weeks, and was employed at Shrewsbury. Mr. Johnson proved that he had purchased the collodion and the prints from the prisoner. Mr. Bluck contended that there was no case made out, as the prosecutor could not swear to the property. The prisoner might have printed the pictures himself from the negative, and he was prepared to prove that he had purchased the collodion. Mr. Mansfield said that the case was more like an infringement of a right than anything else. If he had taken the negatives, no doubt he had committed a trespass, for which he might be sued, but he would not be guilty of a larceny. There appeared so much doubt about it, he thought it would be safer to dismiss the charge.

Letters to a Young Photographer.

No. XIV.

My dear Eusebius,

As the old song says — "I've locked up all my treasures," and as the song does *not* say — I've put the key in my pocket. I am not going to stay here, half roasted or baked alive, just to gratify you with writing letters. I am off "to fresh fields and pastures new," and shall expect to meet you at Wolverton Station, on Monday forenoon, in full marching order. I shall leave here by the first train. I do not intend to encumber myself with any photographic luggage, but will make use of yours, and shall expect to find every thing clean and in good working condition. I may bring with me a new tent, which is very roomy and portable; but have not yet decided upon even encumbering myself with that indispensable article, as you will have your dark box with you. I have got a nice patent knapsack, into which I have stowed away a couple of shirts, two pairs of socks, my old slippers, and an interesting volume. With this and my trusty sapling oak I am ready to make the circuit of the globe. With no greater encumbrance, except a stout pair of walking shoes, I made the tour of half of Europe, going over some six thousand miles in twenty months; that was before railways were much in vogue, and I feel as if I should like to do it again. The face of the world, as well as my own, has grown wrinkled since then. That journey done, I thought I had *done* the old world, and would hob-nob with the new, so I crossed the Atlantic, and my first daguerreotype picture was taken on a site famous in the annals of history, and dear to every lover of liberty, on Bunker Hill, near Boston, where our grand-dads fought and shed their blood in defence of noble principles.

But I am wandering from the point. I suppose if I ask you to bring every thing, you will leave behind something we cannot do without, so I must needs give you a list of the indispensables.

Item. Camera and lenses.

Do not carry the lenses in a green baize bag as many persons do, whereby they are extremely liable to become scratched or broken, but have a little box made to hold them, and pack them carefully in cotton wool.

Item. Tripod (folding).

Item. A portfolio, into the pockets of which you will put your prepared paper, carefully secured in an envelope.

Item. A veil of black merino, to cover the camera and head while focussing.

Item. Three gutta-percha dishes, fitting into each other, and three funnels, ditto ditto.

Item. A quire of blotting paper, some cut filtering paper, and some paper coloured yellow.

Item. A box of scales and weights.

Item. The box of chemicals, containing nitrate of silver, iodide of potassium, acetic acid, citric acid, gallic acid, and hyposulphite of soda.

Item. Graduated glass measure, two ounce.

Item. A silver hook, and three or four brushes.

Item. A pressure frame.

Item. Whalebone pincers, black pins, and ball of twine.

Item. A few ounces of 'bacca,' to coax the bumpkins with, and some pieces of ribbon, of various colours, whereby to win the suffrages of the rustic beauties.

If I have omitted anything, be the consequences on my own head. I intend that our operations shall be confined to turpentine-waxed-paper, which I described to you in my last; but as I want to test the value of another waxed-paper process on the present occasion, I wish you would prepare me some paper with *cereoline*, in the following manner: —

No. 1. Dissolve four ounces of white wax in eight ounces of alcohol, by boiling in a retort; attach the neck to a refrigerator, so as to recover the alcohol. When the solution is complete, put it away in a corked bottle to cool. As it cools, you will see certain solid substances appear, which are the components of wax insoluble in alcohol. The cereoline remains in solution, which may be separated from the solid matters by filtration through a piece of fine muslin, and afterwards through filtering paper, first adding to the solution the alcohol that has been distilled over. Keep the solution in a glass-stoppered bottle.

No. 2. Dissolve in three ounces of alcohol three drachms of iodide of potassium, ten grains of bromide of potassium, and ten grains of the fluoride of that salt.

No. 3. Put about ten grains of iodide of silver into a glass measure, and pour upon it, drop by drop, until it is all dissolved, a concentrated solution of cyanide of potassium. This is added to the solution No. 2, and well shaken. A large quantity of deposit falls to the bottom of the vessel, which consists of the bromides, iodides, &c., and which will serve to keep the alcohol constantly saturated.

You will prepare the negative paper by taking five ounces of the solution No. 1 and adding to it half an ounce of No. 2, carefully filtering the mixture in order to separate the crystals, which would produce spots on the paper. Pour it into a clean porcelain or glass dish, and immerse in it four or five sheets of paper, and let them remain a quarter of an hour; then take them out, drain, and suspend them to dry in a dark room; they will assume a rose-red hue. Preserve them from the air and dust in a portfolio.

The sensitising is performed in the usual manner; the proofs are developed with gallic acid, and fixed with hyposulphite of soda.

I do not expect to find this method of preparing waxed-paper any better than the turpentine waxed-paper process, but I think it desirable to give it a trial, in conjunction with the other, so as to establish a just comparison.

I have always been a strong advocate of waxed-paper processes for out-of-door work, and I think if sufficient care and patience were bestowed upon them, few photographers would encumber themselves with collodioned plates at this season of the year, when good results are so uncertain.

When we return I shall essay the various preservative processes — from Taupenot to the end of the chapter.

Photographic Glossary.

Oxides of Silver — There are three oxides of silver: the *suboxide*, consisting of two atoms of silver in combination with one atom of oxgen; the *protoxide*, composed of one atom of silver and one atom of oxygen; and the *per*oxide.

Oxyacids — In chemical nomenclature this name is given to those mineral acids into the composition of which oxygen enters, such as nitric acid NO_5, sulphuric acid SO_3, &c., in opposition to the hydracids, or acids into the composition of which hydrogen enters, as hydrochloric acid.

Oxygen — A colourless, inodorous gas, probably the chief constituent of the physical world. It forms one-fifth of the atmosphere and eight-ninths of water, while most of the earths and metals are oxides. It is the chief supporter of combustion and of respiration.

Oxyhydrogen Light — Oxygen and hydrogen gases mixed in the proportions in which they combine to form water burn with an intense heat. The oxyhydrogen flame thrown upon a cone of burnt lime has been proposed for illuminating objects so as to enable photographic pictures of them to be taken at night.

Oxymel — A mixture of acetic acid and honey, much used in pharmacy. It is employed as a preservative agent in photography for excited collodionised plates.

Ozone — Atmospheric air, or dry oxygen, when exposed to the passage of a series of electric sparks, emits a peculiar and somewhat metallic odour. An examination of this odourous air has shown that, in addition to the smell, it assumes several properties not exhibited by pure oxygen. One of its most curious effects is the liberation of iodine from iodide of potassium. It is supposed to be a peculiar modification of oxygen, in which the affinities of this element are enhanced in a remarkable manner.

Palladium — This metal closely resembles platinum in colour and appearance, but is less dense and more oxidisable than that metal. It is slowly attacked by nitric acid, but readily dissolves in *aqua regia*. Protochloride of palladium is recommended by Dr. Draper for darkening collodion negatives.

Paper — Photographic paper is a pure form of cellulose. It is composed of vegetable fibres, as linen, cotton, and flax. As various chemical reactions take place among the materials which form the photographic image, it is necessary that the paper, which serves as a vehicle, should be of the greatest possible purity; hence it becomes a special object of manufacture, the aim of which is to produce a texture as fine and as even as possible, free from spots, and strongly sized, so as to resist the prolonged action of water. It is extremely liable to be contaminated by fragments of iron, brass, and lime, which produce fatal defects in the photographic picture. These foreign bodies

may be removed by immersion in weak hydrochloric acid, and afterwards washing in running water, but the sizing is impaired by this treatment.

Pendulum — A pendulum vibrating seconds is a convenient apparatus for the photographer, in the absence of a clock or watch. The length of such a pendulum is about thirty-nine inches and may be easily extemporised by a plumb line, &c.

Pentasulphide of Potassium — Liver of sulphur. A compound of one equivalent of potassium with five equivalents of sulphur. It is used in photography as a means of converting residues of silver into the sulphuret.

Phosphates — Combinations of phosphoric acid with bases, the most important of which, in photography, is the phosphate of soda.

Phosphate of Soda — There are several phosphates of soda, of which the common tribasic phosphate is of most importance in photography. It consists of six equivalents of soda in combination with two of phosphoric acid, united with water of crystallisation, and crystallises in oblique rhomboid prisms, which are efflorescent. Phosphate of soda is an ingredient in Mr. Maxwell Lyte's toning bath.

Phosphoric Acid — An intensely sour and powerful acid. In its anhydrous state it exhibits as great attraction for water as anhydrous sulphuric acid. When thrown into water it combines with it with explosive violence. Once in a state of hydrate the water cannot be again separated.

Phosphorus — A metalloid which has a great affinity for oxygen; it inflames spontaneously in the air, and must therefore be kept under water. The reducing power of the fumes of phosphorus have been turned to account in photography.

Photography — The art by which pictures are obtained by the action of light on certain sensitive agents, the principal of which are the chloride and iodide of silver.

(To be continued).

New Books.

The Photographic Tourist. Third Edition.

F. J. Cox, 22, Skinner Street, Snow Hill.

This is a useful little manual, and in it will be found a very good account of the collodio-albumen process, introduced by M. Taupenot, that being the dry process most preferred by the author, as applicable both for taking negatives and also for printing transparent stereoscopic positives on glass.

In the section devoted to positive printing upon paper we regret to find the hyposulphite of soda toning bath still recommended, although it must be admitted that the formula given is one of the *least* objectionable. The author may possibly think this remark rather hard, seeing that we formerly advocated a similar toning bath. True; but it was before we knew of a better one. Photography is like the bean-stalk famous in nursery literature, and grows at railroad speed. Those who have once tried the toning bath suggested by Mr. F. Maxwell Lyte will not be likely to abandon it for any other very readily, it being sound in theory and easy in practice: it is, in our opinion, unquestionably the best yet introduced.

For mounting paper proofs we consider that the author has erred in recommending gum-arabic — stiff glue used hot is a much better article; also india-rubber solution has many greater advantages.

Besides several other matters, the book concludes with details of the oxymel process and the method of printing upon opal glass in the camera, including also instructions for producing photographic slides for the magic lantern.

Catalogue of Photographic Apparatus, Processes, &c.

Murray & Heath, 43, Piccadilly.

We have had this before us some little time, but owing to a pressure from abundance of more important matter, have been unable to notice it earlier.

A correspondent in a recent number held up to ridicule pamphlets of this class generally under what we believe to be an erroneous impression — upon the principle that "what is to be had for nothing is worth nothing" — but as the publishers "reserve the right" to charge sixpence for each copy of the present pamphlet, perhaps it may be questionable whether it would come under the above category.

The object of the *bookling* is to promote a taste for photography, and to smooth the way in its pursuit — thus creating a demand for materials and apparatus — of course in the hope that, out of gratitude for help afforded, the recipients may become customers to the parties assisting. This is quite legitimate, and put forth without any false pretence.

Besides the usual descriptive matter relative to apparatus and certificates of excellence from many noted photographers, there are various useful recipes and processes given.

We regret, however, to perceive that one generally so acute as Mr. Heath shows himself to be, should have been misled by the following, which we extract, viz.—

"M. Niépce says 'that pictures printed with a salt of uranium, and developed with nitrate of silver, will resist the energetic action of a boiling solution of cyanide of potassium.' And he adds: 'everything therefore leads to the hope that this new mode of printing positives is the sought-for solution of that important problem — the absolute fixing of photographic pictures.'"

It is quite true that the assertion was made, but if he had simply tried the experiment he would have found it *an assertion*, AND NOTHING MORE.

Foreign Correspondence.

Paris, July 9, 1859.

The scientific world in general, and the photographic world in particular, prefer, I opine, nature to art at the present season. At various *reunions* which I attend in virtue of my office, I am frequently one of a select circle of the three or four who compose the audience. Who can patiently listen to papers on "lactic acid," or the "functions of the spinal marrow," read under a temperature of 88°, with a thunder-storm looming over head? Is not this pursuing knowledge under difficulties? My ardour in the pursuit of science would carry me to the top of Chimborazo, but under the baking heat of an inland city my energies fail. An unusual prevalence of thunder-storms would seem to have some connection with the mortal artillery of Magenta and Solferino. At any rate they are watched and listened to with peculiar interest just now, and a sudden thunder-clap will bring all Paris to its doors and windows, with blank expectation in every face. If your Journal was appropriated to meteorology, I could fill every column with curious facts and bold theories on the unusual phenomena of the present year. But photographic philosophy melts away like ice before a midsummer sun, and your correspondent's office is little more important than "chronicling small beer."

We have not yet done with our "new action of light." You may believe it or not, just as you please. What I communicate is believed here, and I must own myself perplexed, when I see our discoveries questioned, disputed, and denied on your side of the channel. I think it would not be difficult — it certainly would be very satisfactory — to test what M. Niépce claims for his discoveries. The experiments lie within the capacity of almost every tyro in science. M. Niépce thinks that he has observed a new phenomenon connected with the discoveries he claims to have made. He finds that if a small quantity of a solution of starch or of dextrine be submitted to the action of the sun's rays for about a quarter of an hour, it will be entirely converted into glucose or grape sugar. The presence of the sugar can be easily proved by the ordinary tests, or more readily by the sweet taste of the solution. If the result of this experiment be verified the transformation will explain a great many natural phenomena. Every day witnesses the formation of considerable quantities of sugar during the ripening of fruits, and M. Niépce considers he has proved that, by enclosing bunches of grapes at the beginning of autumn in paper bags saturated with tartaric acid, he not only accelerates their ripening, but also greatly increases the quantity of sugar they contain. Tartaric acid, as well as nitrate of uranium, has, he maintains, the property of storing up light in a state of activity and chemical efficiency. But it is no use recommending you to repeat this experiment, for I have heard, on very good authority, that the sun seldom or never shines in England.

Photographers who have gone to the seat of war to exercise their talents remark that the time of exposure in the camera has to be greatly increased, even when working with the same apparatus and chemicals as employed at home. This fact, that actinism diminishes as we travel southwards, was noted many years ago by Dr. Draper, of New York, in removing from that city to Charleston, in South Carolina, a distance of about 650 miles. M. Berchtold, whose improved process of photographic engraving I described in my letter of 24th May (p. 141), has discovered a method of producing these engravings in relief, so that they can be printed at the ordinary printing press, like wood-cuts. By employing a negative as a *cliché* he is enabled to bite the metal sufficiently to produce a design in relief, without injury to the delicacy of the design. The metal he operates upon is zinc. I have just been shown some

photographs in carbon and coloured pigments, which are the most perfect things of the kind I have yet seen. They have all the qualities of proofs obtained with the salts of silver, and by many will be thought superior. The inventor is M. Lafon de Camarsac, who some time ago invented enamelled photographs. He appears to have completely solved the problem of unchangable positives, whether in carbon or coloured pigments. Had he been a little more alert he might have won the De Luynes prize. J. P.

Correspondence.

[We have received the following in consequence of our remarks upon the Annual Report of the Blackheath Society, relative to the introduction of salts of uranium as photographic agents.]

SALTS OF URANIUM, &c.

To the Editor.

Sir,—I was one of the very first experimenters, I believe, in photography, and I fixed photographs with ammonia and salt, which I believe, as far as I could hear, were the first paper photographs of any kind ever fixed at all. I never published my experiments, and other pursuits and residence abroad had entirely diverted my attention from photography. In 1854 I got hold here of, I think, Hunt's *Researches*, and Bingham's *Manual*, and found an immensity had been done which I knew nothing of. I first began again with experiments built on Mr. Ponton's chromotype and on Sir John Herschel's iron process, and succeeded in producing in this way my cuprotype and the ink process with binoxalate or ammonio-oxalate of iron and chromic salts, as well as many results published, and some others *yet unpublished*. During the course of the winter of 1854-5, and the summer and autumn of 1855, I made very many thousands of experiments in the directions indicated, as well as with every one of the metals or their salts which I could by any means or at any price get hold of, and also with a great variety of organic substances. These experiments were in *no* case made at random, without some *definite* idea, or some distinct expectation of exact results wished to be attained, but the whole being guided by my knowledge of chemistry, which has long been a favourite pursuit of mine.

Among the metals on which I experimented much, besides those in new directions with metals already to some extent tried by others, were *tungsten, titanium, molybdenum*, and *vanadium, rhodium,* palladium, uranium* — hitherto altogether untried. Uranium I found to be the most prolific of all in good or interesting results, palladium the next.

A meeting of the British Association being about to be held in Glasgow, I wrote to the Secretary, telling him I had a lot of novelties in photography which I should be happy to communicate. He replied they would be happy to get them; so I went over, taking with me my specimens and notes. I was put down in the lists of sectional meetings for a paper entitled *Photographic Researches*; but, with the exception of some short allusions to my experiments with other metals, iron, chrome, &c. &c., confined myself to, first, uranium and the various developments of it with silver, gold, and palladium, ferridcyanides and ferrocyanides, and the modes of toning the prints so produced; and secondly, to pointing out the rationale and analogy with Sir J. Herschel's ferric processes, and describing some improvements in the latter, by toning with gold, &c., and fixing them with ammonia, &c.; and thirdly, by giving a few short statements as to some of my attempts to improve the old silver processes, by the introduction of the organic or other salts, as advantageous both for negatives and positive prints. I showed at the meeting (besides the few specimens which, finding there was a photographic exhibition connected with the Association, I put into it) a great many more, most of which were afterwards given away or lost, or used up in experimenting farther on them as to toning baths, &c.

I showed also, though *not described* in my paper or *Photographic Notes*, either the scraps I showed you when here, or others *like them*, of the effects produced by newspaper and book *print* on the uranic paper from absorbed actinism, that is to say, they lay on the table; but the time was short, the hour of the section being nearly up, and I merely alluded to them as results owing to absorbed light, allied to those published by Möser, which I intended farther investigating.

My paper was not published in the Reports. I was asked to re-read it at our Photographic Society, in February, 1857, and did so, with some *abridgments*, alterations, and insertions, as you will see by the report in *Photographic Notes* of March, 1857. The editor refused, at first, to mention that the paper had been previously read, as it would derogate from the dignity of his publication to republish anything, and some at least of our Society's Council also objected to the insertion of such a notice, but I afterwards insisted on the acknowledgment of the fact.

Not only have I given these and *every other* photographic discovery which I have made *freely* to the public, but have *given away* and offered to any one who wished them large quantities of oxide and salts of uranium, and prepared paper and everything necessary, as well as offered any farther advice, instruction, or explanations to any one asking for them, either by word or writing.

Previous to the *re*-reading alluded to, I ordered from London 1 lb. of the oxide which was on that occasion, along with nitrate, prepared paper, and development salts, offered to any one who liked to take them; and no one coming forward, several ounces of the oxide were placed in the hands of our honorary secretary, *pro bono publico*.

I send you a copy of my old pamphlet on *Photography in Colours*, far superior, I believe, to any of the *new* patents in the same direction which have lately been published. Had a patent been taken out, I have no doubt it would have paid and been at work long ago; but such is the world we live in—what is to *be had* for nothing is valued as *worth* nothing. Even as it was I should have had it at work, were it not that there was but one chromo-lithographic printer here, and he, though a most excellent chromo-lithographer, so wedded to the old system that I could not get him to take it up, though to be paid for his trouble. However, the whole will be probably patented and brought into use some of these days. One of the patents published in a late London journal shaves part of it very closely. I have no doubt the patent-mongers hate me heartily for discovering and giving freely to the public what they would have coined — or tried to coin — money out of; but they need not, for I doubt very much whether they are generally capable, had they the opportunity of as long a life as Methuselah, of anything more nearly *approaching* discovery than piracy or petty alteration (generally for the worse) is.

I send you the rough slip of a short explanation which ought to go along with "John Brown of New York's" pamphlet, explaining so far the *main* principle of it.

I see, on looking at the paper of Dr. Draper, that it does contain some more details than I gave. Dr. Draper is a man of real ability and an original discoverer, and not one of that crew whom I have some cause to detest. Still you may note, *en passant*, the fact that I had previously *in your Journal* pointed out the application of the chloride and other salts of palladium for toning silver prints, &c., as well as for developing uranium prints; but this is a mere bagatelle, not worth naming alongside that most monstrous and systematic plagiarism to which, in defiance of the published evidence, the Blackheath Council has seen fit to volunteer its certificate of genuine and prior discovery. * * * * Thank you, however, for bringing my claims under its formal and especial notice. I am a lover of peace, and would rather not believe any evil (especially of brother photographers) which I am not *compelled* to believe; so, though they scarcely deserve it, they shall have time and opportunity to amend their false position, which doubtless they will be happy to avail themselves of.

There was one palladium-developed uranic print in the Exhibition, at Suffolk-street, and several more were sent but not exhibited, though their entire novelty *might* have ensured them a place, even though rather late in arrival. The "leather-varnish" of Blanquart Evrard is a copy, *exposed at the time it appeared*, and admitted to be no novelty even by the editor of a contemporary publication.—Yours, &c.

C. J. BURNETT

* There is, however, an allusion to palladium and rhodium in Mr. Hunt's valuable *Researches*, but without its appearing that any results worth mentioning had been obtained from either, or without saying how they were tried — probably alone on paper, in which way they are *much* too slow for any practical use.

PHOTOGRAPHIC TENT.

To the Editor.

Sir,—In your article on the meeting of the South London Photographic Society, in your Journal of the 1st instant, you give us Mr. Leake's method of constructing a tent for out-door photography; which, with all due deference to Mr. Leake, is far from a new invention. A friend of mine has used a tent of exactly the same construction this last year or more.

One thing we find very inconvenient, viz. — there is nothing to fix the bath, bottles, &c. to, having only the small iron supports at the corners.

If Mr. Leake, or yourself, would be kind enough to give us a good method of fixing the movables during the manipulation, I think he would oblige many besides yours, &c. OXONIENSIS.

POSITIVE PRINTS OF VARIOUS HUES.

To the Editor.

Sir,—As a constant reader of your Journal, I met with directions in your number for May 1st (page 114) for obtaining coloured proofs. But as I did not succeed, I imagined that there was some peculiarity in your use of the words "positive paper," "negative paper." Can you kindly, in your next number, insert some explanation of the words "positive" and "negative?" For they evidently do not mean ordinary positive or negative paper, in the *manufacturer's* sense, but that which is *chemically* positive or negative, I *suspect*.—I am, yours, &c.

June, 29, 1859. AMATEUR.

[The directions given are not ours, but those of our *Paris Correspondent*, who reports a rediscovery by M. Nièpce de St. Victor of a process long ago published by our friend Mr. Burnett. We have no doubt that the "positive" paper there mentioned simply means such as is used for printing upon as regards the fabric, which is *stronger* than the kind used for negatives.—Ed.]

CONSTITUTION OF THE PHOTOGRAPHIC IMAGE.

To the Editor.

Sir,—The experiments of MM. Davanne and Girard tend to confirm what has been surmised by many photographers, that the altered state of the exposed film is its reduction to the metallic state.

There is, however, one point they have left untouched—the over-exposed plate. Allowing that lights and shadows are regulated by the more or less mineralisation, how is it, that in an over-exposed plate (the sky for instance) this reduced metal refuses the action of a developer? One would imagine that when the iodide is totally decomposed the liberated silver ought to be in the best state for combining with other molecules of silver, but evidently the metal brought into existence by exposure to light undergoes a reaction.—I am, yours, &c.

Islington, June 27, 1859. THOS. A. BARBER.

[We do not at all agree with our correspondent relative to the opinion expressed by MM. Davanne and Girard, regarding the *metallic* constitution of the photographic image. We neither consider the surmises correct nor the experiments of those gentlemen corroborative thereof. We allude to this matter in our Leader. The very point now adduced by our correspondent militates very strongly *against* the theory suggested, especially when taken in connexion with other known facts.—Ed.]

DIFFICULTIES IN FOTHERGILL'S PROCESS.

To the Editor.

Sir,—Perceiving, every time I read your Journal, your kindness in answering the letters of your various correspondents, and especially your anxiety to put those right who are wrong, I am desirous of profiting from your advice, respecting a series of failures I have had this year with the Fothergill process. I may just say that, last season, I tried this process and was very successful with it, using an old bath; this season I made a new bath, and bought a first-rate set of new apparatus, thinking that, as I had managed so well last year with the small sizes, I might produce larger pictures this year.

My bath is made of fused nitrate of silver, forty grains to the ounce. I have tried all sorts of collodion—Keene's, Horne and Thornthwaite's, Ponting's, &c., &c.; and, as I am an operator of two years' standing, and as some of my friends have had plates sensitised in my bath, which have turned out good pictures, there can be nothing wrong there; but it is in the developing, I think, where my failures are made, and for the last three months I have tried unsuccessfully to ascertain whence it has originated.

After exposing the usual time I put my plates in a dish of distilled water, and afterwards develop in the usual way with pyrogallic acid and a few drops of silver. Now, I find that, after the developer has remained on the plate a short time, small red spots appear, and these gradually form into black marks (thus + † × †), and completely spoil the picture. On a plate 12 × 10 I have seen some hundreds of these marks.

Now, sir, I have had some of our best photographers to look at them, and they cannot tell me anything about them. I consulted —— & ——, and they could not tell me either; what makes me think it is in the developer is, that some plates I have prepared and given to a friend have turned out good pictures, while some that the same party has prepared himself from his own bath, have in *my* hands turned out like my own, and in his plates, from the same bath and the same process, have been all right. —— & —— suggested that the developer should be carefully filtered—an operation which I performed but with no better results.—I am, yours, &c.

A MARTYR TO THE "FOTHERGILL PROCESS."

[Your failure is, doubtless, due to the development—not the developer. The marks you mention indicate the presence of *foreign matter on the surface,* which form centres of chemical action.

The dish of distilled water—do you wipe it free from dust before putting in the water, and are you certain that the distilled water itself has no floating particles? Again, are your measures clean with which you pour on your developer?

Lastly: The nitrate of silver added to the developer—is it some of the bath, or fresh solution?

However, proceed as follows:—Take a piece of *old, well-washed flannel,* and tie it over the mouth of the tap of your cistern. Attach a pneumatic holder to the back of your plate; hold it under the tap and let the water fall on the centre of the plate through the flannel, which not only breaks the force of the stream, but arrests any little floating particles. Incline the plate in every direction so as to wet the whole surface; it should not be soaked, but wetted as quickly as possible, and with but little water. Drain for a few seconds, then flood over it about half an ounce of *distilled water* from a clean measure; pour it off and drain slightly. Previously to wetting the plate, put into a clean measure about ten minims of *fresh* (that is not bath) nitrate of silver solution, and in *another* the quantity requisite of pyrogallic developing solution. While draining from the distilled water, mix the above together, and immediately pour the same over the plate. When developed, wash under the tap as before. We think that if you attend to the above you will have no more trouble with the spots you name.—Ed.]

PRINTING ON OPAL GLASS.

To the Editor.

Sir,—In the course of my experiments upon opal glass, I found that by increasing the gelatine solution to twenty grains, and adding two drops of ammonia to each ounce, I got a beautiful delicate pink tint. I have repeated the same several times with exactly the same results, and therefore would recommend this alteration in my process to those who are operating in this direction.—Yours, &c.

Liverpool, 6th July, 1859. J. A. FORREST.

ANSWERS TO CORRESPONDENTS.

Querist.—Alcohol 4 oz., ether 6 oz., pyroxyline 60 grains.

W. W. (Truro).—We cannot recommend makers; each has doubtless his respective merits, which you must ascertain for yourself.

Peter Pindar.—We have seen the French photographs you mention in the shop windows in the Strand, London.

Anakin.—Your article is not declined, it has merely stood over for want of room: it will improve by keeping.

Linch-pin.—You will find the tables you require in *Lay's Photographic Almanac,* page 65.

H. Nicol (Berwick).—You will find a very good note on collodion in No. 90, page 74, of this Journal.

A Subscriber.—The number referred to is out of print, and cannot be supplied at present. Your suggestions shall have attention.

A Beginner.—See "Letters to a Young Photographer," No. 4, and the article in our "Photographic Glossary."

Ben Trovato.—Messrs. Marion's photographic manufactory is at Courbevoie, on the Seine.

Caroline inquires if there is really such a person as Eusebius. We will send his portrait in exchange for her own if she agree to this arrangement.

P. C.—Sterne—A. M.—In every number now we have to repeat that we cannot write privately to any but personal friends. Through the Journal we are always ready to afford our best services.

Tyro.—The strength of cyanide of potassium is very uncertain; better make the solution too weak than too strong. You must ascertain the strength of your sample by experiment.

William.—Marine glue is said to be composed of caoutchouc one pound, dissolved in four gallons of crude naphtha. When dissolved, add two parts by weight of shell-lac to one part of the solution.

Oxon.—You do not require expensive apparatus to study the elements of chemistry with. Ten shillings judiciously expended will procure all you require.

G. Brand.—The book is very scarce; there is no copy in the British Museum Library. A photographic copy of the title page would be a curiosity and highly prized by the bibliomaniacs.

S. S. (Halifax).—The engraving is exposed to the vapour of iodine, and then placed upon a polished copper plate; under pressure, the design is transferred to the copper, and inked; then the plate is etched by nitric acid. The theory of this process bears some analogy to the Anastatic.

Sambo.—In Maxwell Lyte's toning bath you must tone to a purple, approaching even a bluish, to acquire black tones after submission to the hyposulphite of soda. The slightly red hue, when wet, disappears on drying.

J. W.—We invariably employ for our own use in this way our own simple honey process, which you will find detailed in several of our late numbers, in reply to other inquirers. It does not occupy more time than ordinary wet collodion in preparing or developing, except about *one minute* additional to cover the plate with syrup.

Liquid Glue: W. F. H.—The cement sold under this name is simply a solution of shell-lac in methylated spirits of wine. A very excellent liquid cement for uniting pieces of bone, horn, pearl, or shell is made by dissolving one ounce of gelatine in one ounce of strong vinegar (Beaufoy's), adding two drachms of alcohol, and a pinch of powdered alum. The bottle in which the ingredients are contained must be placed in a vessel of hot water until they are dissolved, stirring occasionally.

Received.—"J. P. R.," "Amateur," "R. Beck."

*** Several Advertisements have been left over till next number.

☞ The Publisher will be glad to receive applications from suitable persons desirous of becoming Agents for this Journal in London and its Suburbs, and in other localities where no Agent has been appointed hitherto.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 99, Vol. VI.—AUGUST 1, 1859.

In our last issue an advertisement was inserted by the "authorities" of a Photographic Society in the north, announcing their intention of awarding prizes, consisting of silver and bronze medals, and also one of money, intended of course for the encouragement of photographic excellence.

This is a course of proceeding which we much regret to see adopted by a Society professing to hold an important position, and numbering amongst its members very many skilled operators. Prizes may be all very well for the purpose of holding out an inducement to mere beginners to attend to the niceties of manipulation requisite to produce results fit for competition—though even in this case considerable difference of opinion exists as to the soundness of the policy; but when such are offered to those who are proficients, it appears to us a measure puerile in the extreme.

Setting aside however the question, whether the presentation of prizes at all is conducive to progress, there are other and very grave objections to be noticed relative to the announcement to which we refer, and some of them we will discuss—not by way of tendering any intrusive advice to those who would probably regard it as an impertinence—but as the announcement has been made by public advertisement, and is one ~~which we regard as affecting~~ photographic interests, we presume that we shall be quite in order in expressing an opinion, and pointing out the way in which we fear that evil, instead of good, will be likely to arise from the acts deprecated.

In the first place, we are credibly informed that the award of prizes by the same Society, after holding its last exhibition, gave much offence and dissatisfaction, and produced an amount of "envy, hatred, and malice, and all uncharitableness," painful to contemplate. We do not for a moment mean to assert that the recipients were not worthy, or that any undue favour was shown to them. On this point we express no opinion. But we do assert that the method adopted of selecting the successful candidates was altogether wrong in principle; it having been by a majority of votes obtained from the general body of members of the Society. Such a method can never be satisfactory, liable as it is to every variety of caprice; and we are convinced that under such a system, be the prizeholder whomsoever he may, he will be sure to come in for a large amount of ill-feeling.

One of the principal objects of the managing body of any Photographic Society should be emphatically the *promotion of good feeling and kindliness* between those who are engaged in a common pursuit; it is in our opinion of the highest importance to the well-being of any Society. Can a measure which tends directly to destroy this desirable object be regarded with other than suspicion?

In the official announcement of the intended prizes nothing whatever is said as to the method of awarding them; and the vague manner in which the classes are defined is not calculated to insure any amount of effort whatever on the part of exhibitors. Any one having a picture tolerably good may exhibit it upon the *chance* of getting one.

A silver medal is offered for the best photographic *portrait* or *group*, and a second similar medal for the best photograph of *any other subject* than the above. This looks as if a portrait were estimated of equal value with a group, other things being equal: nothing whatever is said about the sizes, while all other subjects are quietly classed together—such as landscapes, copies of paintings, stereographs, statuary, still life, clouds; but how the *relative* merits of such an incongruous collection are to be ascertained not even a hint is given.

The perplexity is still further increased, as regards the Maconochie Wellwood prize of ten pounds in money, to be competed for by the professional members of the Society only, in consequence of groups of figures being also included as entitled to competition—the only kind of photograph excluded being *single portraits*.

What good can the managers of the Society hope to attain by so ill-devised a scheme? Is it to be expected that exhibitors will put out their strength (supposing them to care for a prize at all) without first knowing what are the rules by which their productions are to be judged, and *who* are to be the administrators thereof? We are curious to know how composition pictures from several negatives, such as our friends Rejlander, Robinson, &c., produce, would be dealt with—not that there is much chance of one at least of these gentlemen exhibiting.

But if we regard the prize scheme for pictures ill-designed, what shall we say to the offer of bronze medals, with various clogs appended by way of conditions, for *approved original communications*, to be primarily submitted to the Society (we presume the Council only) and to be *subsequently* read at the ordinary meetings, and published as part of the transactions? What a truly attractive proposition for authors! How fresh and original the papers will appear after having been *primarily submitted* to some score of gentlemen! What a dignified position for those who devise "inventions, discoveries, and improvements in the optical, chemical, and mechanical departments of the photographic art!" Do the promoters suppose that *inventions* and *discoveries* can be "made to order" like a coat or a pair of boots? Are those who offer the prizes to be the judges? Their competence for the office would seem to be dimly shadowed forth by the delicate insinuation conveyed in the fact, that the producer of a fine photograph (if even a portrait only) is to be rewarded by a medal of silver, while he who devises the means of its production must be content with bronze—it should have been brass!

This proposition is altogether a gross mistake, and looks very much as if papers to be read at the meetings are scarcely to be obtained by ordinary means; if so, we are morally certain that the steps now taken are not likely to improve the aspect of affairs. We doubt whether one single follower of the scientific part of photography would not rather be deterred from allowing any of his productions to be read before a Society which acts as if offering lollipops to a schoolboy.

It has often been remarked that there is more in the *manner* than in the *matter* of some actions; and truly some things that are inoffensive in themselves can be made highly obnoxious by their mode of presentation. Now, if prizes are to be given for papers at all, nothing approaching to *competition* should be admitted in the matter. Can any of our readers point out a prize poem or prize essay that is worth the paper on which it is written? We believe that the only method by which there would be any chance of succeeding by the award of medals, in

the object of encouraging the presentation of papers to be read at the meetings of the Society, would be to leave authors untrammeled by any conditions whatever, and to announce that in case any papers, *meriting such distinction*, should be presented and read, medals would be awarded subsequently in acknowledgment.

Many of our readers are doubtless aware that the meeting of the British Association for the Advancement of Science for the present year is appointed to be held in Aberdeen, under the presidency of H.R.H. the Prince Consort. It has been determined by the local committee to hold an exhibition of photographs in connexion with the meeting; and as the Royal President is known to be an ardent admirer of art in general, and leader of photographic art in particular, we may doubtless calculate upon a goodly display. To promote so desirable an object, and for the convenience of our readers, we extract the following regulations from the circular that has been issued :—

All descriptions of photographs will be admitted, except coloured ones. Touched positives, or prints from touched negatives, must be described accordingly. It is strongly recommended that they be framed and glazed, with a margin of mounting board not more than two and a-half inches all round, and that those smaller than 9 × 7 inches be arranged four in one frame. They should be marked on the back with the names of the subject, the process (collodion, waxed-paper, &c.), the artist, and the owner.

A list of the photographs should be enclosed in the case, and a duplicate list forwarded by post to the Honorary Secretary, 107, King Street, Aberdeen.

Facilities will also be given to the makers of photographic apparatus, &c., for the exhibition of such of their productions as may be considered of peculiar interest from excellence of construction or novelty of invention.

Contributions are requested to be sent in not later than the 1st of September, carriage pre-paid, addressed to "The Photographic Exhibition, Music Hall Buildings, Aberdeen." At the close of the Exhibition, they will be carefully re-packed, and returned, free, to the owners.

JOHN F. WHITE, Local Secretary.

107, *King Street, Aberdeen,*
7th July, 1859.

With regard to the above we have one or two suggestions to offer to the managers, which we think, if adopted, will tend materially to enhance the value of their collection.

The first is to avail themselves of a very successful and economical plan for exhibiting *unglazed* specimens, simply mounted upon card-board, employed at the Leeds meeting, and which was subsequently described in our report of that collection, at the latter part of last year. The cost of transport to so great a distance as to Aberdeen, together with the risk of breakage of glass and frames, would deter many from sending their works, and at any rate, reduce the number likely to be sent; while the expense of forwarding unmounted specimens is comparatively trifling, and the plan followed by the Leeds committee entails no waste of glass, and so little of wood and other material, that the entire cost of the whole would be more than covered by the saving in the way of carriage and packing cases.

The second is to *classify* the subjects in some definite manner, especially to separate portraits, landscapes, and reproductions from one another, the value of each class being dependent upon totally different points. It is a great mistake to hang these productions jumbled altogether, as is too commonly done.

In a letter which appeared in the last number of the *Journal of the Photographic Society*, from the pen of Mr. N. Ennel, a gentleman who has displayed considerable ingenuity in devising several useful mechanical contrivances connected with photographic apparatus, we find him asserting that the use of a swinging back to a camera, or any equivalent thereto, is "wrong in principle," and in corroboration cites "a simple experiment with the common burning glass held between the sun and a cardboard. If the common axis of the sun and lens do not intersect the plane of the cardboard *perpendicularly*, the image of the sun is thereon represented *elliptically*." He then goes on, "substituting landscape, &c., and focussing screen for sun and cardboard, we arrive at the same result: we may, indeed, get most points in good focus, *i.e.*, *distinct*, but *every one* point will be distorted."

As we cannot assent to the premises, of course it is not at all surprising that we do not agree with the conclusions; but setting aside for the moment the question whether the use of a swinging back camera is wrong or not in principle, we would ask for a nicer definition of what he means to be understood by asserting that *every point is distorted?* We are almost tempted to fancy, from the experiment he has quoted, that he is not quite familiar with the conditions under which advocates of the "swinging back" recommend its use. The sun subtends but a very small angle of vision, and such as it is the two opposed limbs are not at any appreciable difference of distance from the spectator, consequently in substituting the equivalents in a landscape subject, we should define it as a small window immediately in front of and not very close to the operator. Certainly this is not a subject requiring the aid of a swinging back, which like all other things can be misapplied. Mr. Ennel must select some happier illustration to uphold his argument; let him try to focus one side of a street or lane disposed very obliquely towards him and he may alter his opinion.

With regard to the charge of *distortion*, Mr. Ennel must mean something different to what is usually understood, the latter being a quality due to the *lens* and not to the swinging back. By inclining the plane receiving the image from a lens, the *scales* upon which the objects on opposite sides of the axis are depicted differ somewhat it is true. If this be what he intends by *distortion*, the error is one of degree only, for the same thing occurs to a less extent, even when the axis of the lens is perpendicular to the plane of delineation, in which case objects situated at the margin are depicted upon a slightly larger scale than those in the centre. The only remedy for this evil, that can be regarded as perfect, is that of delineating upon a concave surface, as it always must arise when focussing upon a plane surface however disposed, from the impossibility of the various parts being situated at the same distance from the optical centre; in other words, the length of focus is continually increasing in a series of circles, of which the perpendicular axis of the lens is the centre.

Whilst a plane surface of delineation is regarded as imperative no radical cure can be applied, but a palliative may be employed; and this is best found in constructing such a lens as will throw the optical centre further from the plate than the lens itself, the segment of a sphere of *longer* radius being less removed from a plane surface than a segment of corresponding dimensions from a smaller sphere.

We feel no hesitation in alluding to Mr. Ennel's remarks, being assured that he is only, like ourself, animated by a desire to advocate that which he regards as sound in principle. We shall be most happy to discuss the matter with him.

In another communication to be found in the last number of the *Journal of the Photographic Society*, under the signature "Meniscus," dated from Dublin, an inquiry is made relative to the probable permanence of proofs toned by a somewhat cumbersome method, devised by M. Jobard, and described in a recent number of the *Bulletin de la Societé Française de Photographie*, in which perfect stability is claimed for them by the author. Lest some of our readers should be induced to put much faith in the recommendations set forth, we would draw their attention to the fact, that sel d'or is used for the toning, a salt containing sulphur, producing its action by converting the silver of the impression into a sulphide of that metal, and depositing gold in a metallic state. The employment of sel d'or as a toning agent was an immense advance upon the use of old hyposulphite of soda; but this, in its turn, has been superseded by the alkaline chloride of gold compounds. We have no

hesitation in pronouncing Mr. Maxwell Lyte's method far better than M. Jobard's; and it is probable that Mr. Burnett's method, published in our last, may be better than either of the others.

WHILE on the subject of Mr. Burnett's labours, we may quote, as interesting, the following remark, made in a letter we received some time back from this gentleman, the letter being otherwise only upon private matters:—

I may, however, tell you that I tried some experiments last autumn and winter on paper prepared with mixed solutions of *gum* (and sugar) and nitrate of silver, which would seem to indicate that it is also, just like the nitrate of iron, or of uranium, or bichromate of potash, capable, along with the gum and allied substances *without the presence of iodides or chlorides*, of giving an insoluble and developable picture, and this is probably the explanation of Mr. Young's experiments.

ON IODIDE OF MERCURY IN THE COLLODION FILM.

By T. F. HARDWICH.

A NEW mode of removing excess of free iodine from photographic collodion has lately been described, in which metallic mercury is used. On shaking the bottle rather briskly the globules of mercury are broken up, and diffusing themselves throughout the liquid, rapidly effect the decolourisation.

On reading the description of this process it appeared sufficiently simple; but whether it could be considered safe was doubtful, inasmuch as it has long been known that salts of mercury have a peculiar action in photography. In the earlier editions of Professor Hunt's work, it is stated that the precipitation of calomel in conjunction with chloride of silver interferes with the blackening of the latter compound by light; and those who have employed corrosive sublimate as an application to photographs, either on glass or paper, have noticed phenomena which appear to indicate affinities between salts of mercury and silver. If, therefore, free iodine in collodion becomes neutralised by combining with mercury, how far will the resulting compound affect the action of light upon the sensitised film? The following experiments were made systematically with a view of determining this point:—

A solution of nitrate of silver was placed in two test tubes, to one of which a relatively small quantity of a nitrate of mercury was added. Solution of iodide of potassium, dropped into each, produced in the one case a precipitate having the characteristic primrose yellow of iodide of silver, but in the other a deposit of a dirty grey colour. In the next experiment a portion of the ordinary iodising solution, containing simply iodide of potassium in alcohol, was shaken up with the green iodide of mercury until it would dissolve no more. The quantity of mercurial salt retained in solution was small; but on preparing a plate with this collodion, and developing with pyrogallic acid, only the high lights of the picture could be obtained after a long exposure.

Next a sample of simply iodised collodion, which had become as dark as port wine by keeping, was agitated with mercury until a very small amount of colour remained. On dipping in the bath, the film appeared to form as usual, but no latent picture capable of development by the ordinary reagents could be produced in the camera.

At this period of the investigation the experiments were discontinued, in order to reflect for an instant on the cause of the discrepancy. A process, described as successful in the hands of others, now fails in the most complete manner! What could be the reason of this? Perhaps the collodions operated on were different, or the developers were not the same? Seeing, therefore, that *simply iodised* collodion and pyrogallic acid had been employed in the former case, *bromo-iodised* collodion was now taken, with sulphate of iron as a reducing agent. A bottle of bromo-iodised collodion red in colour was divided into two parts, and one part having been nearly decolourised by the mercury as before, the two were then carefully compared by placing them upon the same glass. This experiment, repeated two or three times, made it quite certain that no difference existed between the portion decolourised and the other in which the iodine was allowed to remain. The use of the mercury had not diminished the sensitiveness, as it undoubtedly did in the experiment which preceded it. Either the sulphate of iron or the bromide must therefore have altered the conditions; and a very few additional trials served to show beyond a doubt that *the employment of bromide* was the sole cause of the peculiarity.

There is always a satisfaction in successful photographic experiments, but never more so than when a discrepancy between two different observers is cleared up. At a meeting of the Photographic Society, now some years since, the objection of one member to the employment of bromide, that it made the negative weak in the sky, was met by the assertion of another, that in his experience bromides had rendered the sky more intense. These observations, although apparently contradicting each other, were nevertheless both correct; for it is now known that, in presence of some kinds of organic matter, bromide may add to the opacity of the reduced silver, although in pure collodion its action is the reverse. So, again, in the proposed new method we are now discussing: metallic mercury is recommended as a good decolouriser, and yet the first trial seems to show that it nearly destroys the sensitiveness. These contradictory statements are thus reconciled:—The proper effect of the mercurial salt is to lessen sensitiveness; but if bromide be present, this retarding effect is not so perceptible.

The writer concludes his paper by mentioning a fact in reference to this matter which he believes will be found both interesting and instructive. In commencing his experiments he had used a small bath specially for them; but finding that the employment of the mercury in the case of the bromo-iodised collodion was harmless, he conjectured that no injury would result if the plates were dipped in the ordinary portrait nitrate bath. The result, however, of this incautious proceeding was, that when immediately afterwards he attempted to take a portrait in the same bath, with a sensitive newly iodised collodion containing no bromide, it was found impossible to obtain a perfect picture. The bath, in fact, had been thrown quite out of order, although the quantity of mercury which had been introduced into it must have been microscopically small. Without any obvious fogging, the image was imperfect in all parts excepting the brightest lights.

Having repeated the experiment many times, and become satisfied that the bath was really disordered and in a useless state for working with an ordinary iodised collodion, it remained to offer some explanation. The contents of the bath measured eighteen fluid ounces, and not more than two stereoscopic plates had been coated with the decolourised collodion. Was it, therefore, possible that a minute globule of mercury had adhered to the neck of the bottle and been washed into the liquid? At all events, it became desirable to try the action of metallic mercury upon a new portion of bath; and therefore a small quantity was shaken up with a globule of mercury, of the size of a pin's head, and plates were dipped. The result was quite confirmatory, and showed, as before, that simply iodised collodion was partially insensitive in such a bath, but that bromo-iodised collodion slowly yielded a picture. These facts may or may not bear upon the employment of bromide as an accelerator in the daguerreotype process, where mercury is used to develop. In pure collodion bromide retards the action rather than the contrary; but it might, nevertheless, be truly spoken of as an accelerating agent, in the collodion process, if traces of a mercurial salt were invariably present in the film.

Practical photographers will extract a hint from the above paper. —When they employ bichloride of mercury as an intensifier in copying maps, or other similar methods, they ought to be very careful that the plates are washed quite clean, and that none of the mercurial salt finds its way into the bath.

SILVER PRINTING PROCESSES.

Including Salting, Sensitising, Toning, Fixing, and Testing Baths.

By C. J. BURNETT.

(Continued from page 162.)

Palladium Toning Baths.

IN my papers of last year, in this Journal, I pointed out (thus was the first to point out) that the salts of palladium, especially the chloride and nitrate, might be enlisted in the service of the photographer, for the formation of toning baths, and also as ferric and uranic developers, the solubility of the chloride of palladium being an important difference from and advantage over that of platinum which is insoluble in water, and rendering it unnecessary here (as it was there) to resort to the salts of other acids in order to avoid a bichloride, though the nitrate is easily prepared, and it or other soluble salt of either oxide answers well.

Alkaline palladium baths also answer well. In my palladiotype development processes (as in the specimens sent to the last Suffolk Street Exhibition) the colour was generally brown, but when used as a toner the tint varies considerably.

As to the questions of pictorial value and expense, the atomic weight is only about half that of platinum, or one-quarter that of gold, but the difference of specific gravity or volumetric value would

compensate for the difference from platinum. As to expense per ounce of the palladium, the first I bought several years ago was so moderate in price as to be very much in favour of my processes with it. Last winter, however, on making inquiries as to price, I was much disappointed to find that it could not even be purchased for the price of gold, but cost about half as much again per ounce. The cause of this rise was at first very obscure, but after many inquiries I obtained this answer, that it had come into extensive demand for alloying steel, a very minute addition of it to the latter giving great hardness, and removing its liability to corrosion by vegetable acids.

A possible objection to palladium toning may be, that it is said to be more easily acted on by sulphur than are gold and platinum.

So much *pro* and *con* for palladium as a toner; further experience, as with platinum, must decide its value relatively to that of its rival metals.

Iridium and rhodium have some points of promise about them, particularly their great non-liability to tarnishing, or injury by oxygen or other substances, or even strong acids, and deserve further trial in various ways.*

I must also recommend for alkaline baths as substitutes for the terchloride of gold or bichloride of platinum, the double salts formed by their combination with chloride of sodium — salts exceedingly readily prepared, and from their nondeliquescence, far more readily kept and weighed than the simple salts of platinum or gold. They have also the additional advantage of being less liable to precipitate, by alkalies in the bath, the chloride of sodium appearing to have some sort of affinity for the aurate (or platinate?) of soda, and contributing to keep it in solution— so much so, that I am even inclined to recommend the addition of an excess of chloride of sodium to the bath with this view, and still more important should be this addition of common salt to a bath made with the pure terchloride. The chloro-platinite of sodium, as well as the chloro-platinate, should be tried. The corresponding platinum and gold double salts containing bromine, may also be employed (and those of iodine and fluorine possibly merit a trial)—and even in the case of palladium the double salts may possibly have some advantage.

Chloro-palladite of sodium—a beautiful yellow double salt— is a capital toner as well as developer. Chloro-palladiate may also be used but is not so good.

To conclude our remarks on the toning-baths. With the alkaline gold baths and the alkaline platinum-baths which we have recommended,† the photographer has at his command almost any variety of tone which may be wished, according to the colour of the print and the extent to which the replacement is pushed. It must be noted, however, that the delaying of the toning till after hypo'-fixation, which is, in the case of gold-toning, a convenience, as enabling us to know better what we are about, is here, with platinum (and with palladium also ?), no mere matter of convenience, hyposulphite (at least when a mixture with alkalies)‡ being a powerful solvent for the deposited platinum or platino-organic compound. By attending to this precaution, photographers will find my alkaline platinum-bath just as manageable and convenient as my alkaline gold-bath; and while the salts of the lower oxide, &c., have additional recommendations, he need still never be at a loss where common bichloride of platinum, washing soda, and it may be, a little tartaric acid or tartrate of soda are procurable. Good enough proportions are:— Distilled water ten ounces, bichloride of platinum ten to fifteen grains, carbonate of soda one hundred grains or upwards, tartrate of soda (replaceable by a smaller quantity of its acid) fifty to one hundred grains. Nothing can well be simpler than such a bath, either in use or in manufacture. However, we must wait, I suppose, here, as in the case of the parallel gold-bath, till it comes authoritatively recommended from a sufficient geographical distance. My own opinion is that the alkaline gold-bath is decidedly entitled to preference on albumenised paper, but that in the plain papers, nitrate, ammonio nitrate, or other, the alkaline platinum bath is quite as valuable any how, it supplies us (probably at no greater expense, to keep within the mark) with a variety of warm and highly pleasing tones which gold does not give; and as a protection against atmospheric injury, it has even probably some advantage, from the greater extent to which the replacement can be pushed without making the tone too cold or bleak.

In connection with the platinum-bath (and palladium-bath ?) it should be observed, that if we are going to fix with hyposulphite the toning must be delayed till after the hypo'-fixing, on account of the great readiness with which the platinum deposit is dissolved by the hypo'-bath. If, when the prints are dried after toning, the tone does not satisfy us, we have only to immerse them again, either in the same bath or in a *weak* alkaline *gold* bath, till the tint wished is obtained, taking care, however, that they are thoroughly and *equally* wet with *water* before immersion in the toning-bath.

(To be continued).

* The metal, however, is not liable to tarnish by sulphur in the air as silver is, and I should not be much afraid of the toning from this source, and if I recollect rightly, my experiments with sulphuretted hydrogen were in its favour.

I have got not altogether unpromising results with the various toning metals, both by introducing them into the salting solutions in place of a portion of the chloride of sodium, &c., used in salting, and also, in the cases of platinum and palladium, into the sensitising baths, the nitrates being in this latter case the salts used. One plan was to immerse the picture after printing for some time in a bath of carbonate of potash or soda, to promote the action of the reduced silver, or the gold, or other metal's salt associated with it in the paper, as this does not seem to go far enough during the printing. I am informed, however, that in the case of gold chloride, a plan so far the same, but with a sulphureting toning bath, was long ago published by some other experimenter. This system seems also to merit a trial in development printing, particularly with iron developers.

† A phosphate of platinum (or borate ?) precisely analogous to Mr. Maxwell Lyte's gold bath may be made in the same way, or a still purer and more certain one, by precipitating bichloride of platinum with phosphate of *potash* (preserving the precipitate for after reduction) or a bath like Legray's, with chloride of lime, might be made? for those who prefer the other modes of carrying out the principle.

‡ By washing out the alkali from the toned prints, we may perhaps tone *before* fixing with hypo'; and when fixing with ammonia, as in the uranic silver prints, there is difficulty in either way.

ERRATA.—In paper on "Toning-Baths," July 1st, page 162, note 2, line 7, for "potash" read "*sulphate of potash.*"

In last line of paper omit the word "*palladium.*"

In sixth line from the end of the paper omit the word "*or.*"

MODIFICATION OF THE WAXED PAPER PROCESS.

By * * * * * * * M.D.

By the guidance of your valuable Journal it seems probable that the "waxed-paper process" will, during the summer months at least, obtain further attention; let me therefore hope that your readers will kindly deem no apology necessary for the intrusion of the following communication:—

Last summer, for a short period, I used, with a certain amount of success, a formula, **No. 1**, which is given with others containing wax, paraffin oil, and benzole, iodised by iodine; the paper, after soaking and drying, being further iodised by formula **No. 2**; dried, sensitised by **No. 3** (Sisson's formula), and developed by pyrogallic or by gallic acid solutions, after one and two minutes' exposure in sunlight.

Lately my endeavour has been to simplify part of the process. Enclosed are some rude results, which I leave to your superior judgment for any remark, should you deem them worth notice; they seem to offer some promise in more able hands. The chief object is to try and save time and trouble in the preparation of the paper and in development, so that those provided with the necessary means might, on the field, readily note their success. It is needless to trouble you with a statement of the numerous experiments I have gone through. Faulty as you will probably find the method, nevertheless excuse my stating it in detail at the risk of being tedious. Manipulation, as you well know, in chemistry is often one of the terms for success.

The paraffin oil is of the ordinary kind for illumination, purchased last year in town: I was then told we might shortly expect a purer kind. Belmontine may perhaps prove superior; I am just on the point of trying it.

Put two ounces of paraffin oil into a phial; add ten grains of crushed iodide of ammonium and four grains of iodine; shake well; let repose for twelve hours. The paraffin, from a fine sherry colour, becomes quite dark. Filter sufficient into a dish and immerse the papers, avoiding air-bubbles (I have used Turner's, Marion's, and Canson's thin post); turn after ten minutes; remove by a corner with a piece of whalebone; hold the paper over the dish, and draw a glass rod or triangle twice or thrice across the front and back; pin up to dry in a warm room, with yellow light or in the dark; if required before they can dry by this plan, place them on blotting-paper and wipe the back with a little clean cotton wool.

Place a clean ground glass level, rub a bit of bees' wax along its edges; filter on to the ground surface some of the sensitising solution **No. 6**, which always protect from daylight; gently float the face of the prepared paper for two minutes; turn, and float the back for one minute; lift by a bit of whalebone and pass a glass rod over the surface. Now plunge into a dish of filtered rain or distilled water; allow it to remain while you filter a few more drops of the silver solution on to the ground glass; place another piece of paper to sensitise; then remove the former from the water, stroking the surfaces with a glass rod; dry on clean blotting-paper and put away in a dark box between some clean leaves of bibulous paper.

Expose, according to light and object, one-half to two minutes.

The development may be effected by what may be called for convenience the quick and slow methods. For the former, place a piece of glass level, pour on it clean or distilled water, and place the paper face downwards for half a minute; turn, and float the back for the same period or longer; in the mean time pour out some of the pyrogallic solution, **No. 7**, to which one-third distilled water may or may not be added; now pour off the water from the glass, holding the paper on it by means of a piece of whalebone; replace the glass level; drop about four drops of a thirty-grain solution of nitrate of silver into the pyrogallic solution, *and at one sweep flush the surface*, allow it to remain till the development begins; then treat it as in the collodion process, as regards pouring fresh solution off and on, &c. Finish by flushing with water, soaking a short time, and clearing by hyposulphite of soda — strength about one ounce to eight ounces of water.

For the latter or slow plan: equal parts of a saturated solution of gallic acid and distilled water, with six drachms of Beaufoy's acetic acid, to four ounces and a few drops of the thirty-grain solution of nitrate of silver. This develops very slowly.

You will find many faults in the specimens sent, and doubtless will be able to suggest a remedy. *A curious* appearance presents itself on placing some (those named on back) in water with back upwards, say in a gutta percha dish; they then look like positives, indeed like dingy daguerreotyes by reflected light. You will notice this particularly with the wall. Another plan, somewhat more troublesome, is to soak the paraffin papers, when dry, in the albumen solution, **No. 5**, for a quarter of an hour: dry in the dark, and keep in a book or case. I am not able to say how long the paraffin papers will keep good when sensitised; but with formulæ **Nos. 1, 2, & 3**, last summer, they were good for a month if developed by gallic acid, and for a week if by the pyrogallic solution. I have just tried some a year old as regards the iodising, and they gave pretty fair pictures.

The foregoing plan is sent imperfect as it is, even at the risk of my being placed on the list with those who throw off their hasty ideas for others to set in order, and then claim the priority of invention. Very possibly others may have tried paraffin, though I have not seen it named. The simple reasons assigned for its use, without reference to its chemical qualities, are the transparency it gives to paper, the readiness with which the solutions flow to its surface, and its reasonable cost. If we could find some iodide soluble in it, I have reason to think, from my experiments, that the papers may be prepared very readily and very sensitive. The iodide of ammonium is not very soluble in it. The smell may be against its becoming fashionable, even if useful.

If you will kindly state your objections, or indeed any hints, they will be received with every acknowledgement by a subscriber and well-wisher to your Journal.

FORMULÆ.

No. 1.

Bees' wax	1 drachm.
Paraffin oil	1 ounce.
Benzole	2 ounces.
Iodine	15 grains.

No. 2.

Albumen	1 ounce.
Rain water	4 ounces.
Iodide of potassium	2 scruples.
Bromide of potash	10 grains.

Filter through doubled linen for use.

No. 3.

Nitrate of silver crystallised	1 drachm.
Citric acid	2 grains.
Glacial acetic acid	1 drachm.
Distilled water	2 ounces.
Iodide of potassium	1 grain.

Filter before use.

No. 4.

Bees wax	2 drachms.
Camphine	2½ ounces.
Benzole	1 ounce.
Paraffin oil	½ "

Add ten grains of iodine and mix.

No. 5.

Albumen	6 drachms.
Iodide of potassium	2 scruples.
Bromide of potassium	10 grains.
Strongest liquor ammoniæ	8 minims.
Powdered hydrochlorate of ammonia	8 grains.
Distilled water	4 ounces.

Filter through linen after well shaking in a bottle.

No. 6.

Iodide of potassium	1 grain.
Nitrate of silver	11 grains.
Distilled water	2 drachms.

Dissolve, and add —

Distilled water	6 drachms.
Beaufoy's acetic acid	1 ounce.
Citric acid	4 grains.

Filter before use.

No. 7.

Pyrogallic acid	10 grains.
Beaufoy's acetic acid	2½ ounces.
Alcohol	1½ drachms.
Distilled water	5½ ounces.

Woolston, near Southampton,
July 20, 1859.

[As our contributor invites comment on the preceding, we offer a few remarks. The specimens sent, although faulty, as mentioned by the producer, indicate that paraffin oil may prove highly valuable in the paper processes: it not only renders the paper very transparent, but flows very readily, and is easily applied.

The belmontine oil is a preparation closely allied to the former, but is perfectly limpid, and much less offensive as regards the scent; it differs from it remarkably in one respect when under combustion, having less illuminating power, and greater tendency to produce smoke and char the wick; it is, therefore, well worth a trial; the qualities named prove a variation in composition, notwithstanding its general resemblance to the first-named oil.

The appearance (like a dull daguerreotype) named, under certain circumstances, is readily accounted for. A slight deposit of silver has been formed *on the back* (which was also sensitised) in that molecular condition most frequently seen where development has been pushed by slow action. It is by no means uncommon.

We notice that, as a rule, the most intense negatives (of those sent), as seen by transmitted light, are taken upon thick paper (Turner's negative), and these exhibit best detail. There is, however, one exception noticeable — the paper is *thin*, but *hard and heavy*, as if it had undergone considerable pressure in the manufacture. It is very free from granulation, and we consider it the best specimen of paper for this purpose. It is labelled "July, 1858 — Nos. 1, 2, 3, 7 — exposed from one to two minutes — developed with pyro — rewaxed."

We will now venture to suggest a course of proceeding, based upon the above, which we think calculated to produce good results, with but moderate labour.

Procure paper thin, hard, and above all, free from grain; albumenise it in the same way as for ordinary positive printing, but *instead* of the salt usually employed with the albumen, use the following, viz —

Albumen	1 ounce.
Liquor ammonia	10 minims.
Iodide of ammonium	4 grains.
Bromide "	2 "
Chloride "	1 grain.

Dry before a fire. When dry, immerse in M.D.'s solution **No. 1**, and again dry. Sensitise on the albumenised side only with solution **No. 3**, and proceed as directed in M.D.'s paper.

By this arrangement the impression will be on the albumen only, and but little affected by the grain of the paper, which will also be rendered strong and tenacious, consequently not liable to tear in washing.

Since the preceding was in type we have received the following note, with specimens, from our correspondent. Again we notice that the paper containing most "body" gives the best results— (some of Turner's old "Chafford Mills") but the transparency of the paper after the use of the belmontine oil does not seem so great as when paraffin oil is employed.—Ed.]

Dear Sir,—By the earliest opportunity I take the liberty to transmit for your notice the first negatives taken with belmontine; that marked No. 1 being the first, and that marked 2 the second, &c. The second was, I think, over-exposed and not kept floating long enough on the water before developing. Canson's has a positive appearance by back view in water. I append the formula used, and am sorry that time does not permit me to send you more. It is my wish to try one or two other plans, and if sucessful may, provided you do not object, hand you their results. These pictures should have further washing in water; I am obliged to

leave attending to them, and venture to send them but imperfectly finished. The pictures are cleaner with the belmontine, which seems to me to be a pure kind of paraffin. Your devotion to science I fear must inflict upon you many rude attempts at photographing for inspection. Pray excuse this hurried scrawl, and with all due apology allow me to remain.—Yours, &c. M.D.

Belmontine	1 ounce.
Iodide of Ammonium, crushed	of each 5 grains.
Iodine	of each 5 grains.

Mixed—reposed for nine hours.

Sensitised by formula No. 6. Developed by formula No. 7.

Time—No. 1. Three minutes, very dull light after heavy storm, 11.30 a.m. No. 2. Two minutes, a little gleam of sun for about fifteen seconds. No. 3. Canson's: two minutes, bad. No. 4. Two minutes, dull but not so much so as when No. 1 was taken.

Am afraid there was some hypo' solution with arg. chloride mixed with the simple hypo' used in all the pictures sent. Unless more washed they may discolour. The hypo' darkens considerably on twice using.

IMPROVED FORMULA FOR DRY COLLODION AND FOR ALBUMEN NEGATIVE PROCESSES.

By C. J. Burnett.

Salt your collodion with mixed iodide, bromide, and chloride, of *ammonium*. The iodide and bromide may be used in the usual proportion, and the chloride as an *addition* in the same atomic proportion as the iodide. However, my impression is that a larger proportion of bromide is advisable. Sensitise as usual, wash away free nitrate with *pure* or slightly ammoniated water, and then coat either *à la Fothergill* with albumen, or else coat with a weak alcoholic, not ethereal, solution of cerĕoline or gum-lac, containing grape-sugar, which tends to facilitate after operations. Keep, expose, and develop as usual.

A mixture of *gum-arabic* (or gelatine) with grape sugar (or glycerine), makes a better protective coating for the collodion, the relative proportions being varied according to whether the plate is to be used dry or moist.* As to variations in the salting, the three calcium salts, iodide, bromide, and chloride, are all soluble in collodion, and may *together* be substituted for those of ammonium. The cadmium-chloride is also soluble in collodion (especially when strongly alcoholic), and may be used either with its bromide and iodide or with those of ammonium. It must be recollected that when used for the preparation of dry plates, made in a large quantity at a time, and out of which the soluble decomposition-products are washed, the stabilities of the different iodides and bromides deserve much less consideration than where photographers are dependent on the keeping of fluid collodion for a long time in bottles.

I have a high opinion of the value of this and the allied processes conducted on waxed or gutta-percha-prepared, or paraffin-prepared paper, as long ago recommended by me, particularly when using the collodion containing a very large proportion of alcohol, to the value of which I was, I believe, the first to call attention, in your Journal of May 15, 1858.† The great advantage of the rarer alkalies named or alluded to in my pamphlet is, that they permit us to introduce phosphoric, iodic, bromic, and the organic acids into the collodion, from the greater solubility of their salts.

In working on the system I especially recommend with oxygen salts, or chloride, of ammonium or trimethylamine, &c. IN *the collodion*, so as to leave salts of silver oxide or silver chloride in the film, instead of the usual free nitrate; it is worthy of note that the exact condition of our sensitising bath as to neutrality, &c. &c. becomes of much less importance than it used to be on the old system—no small gain in point of convenience.

As to our iodide, bromide, and chloride plates in the formula which I have given, *oxide* of silver being still a desirable requisite in developing, the best plan seems to be, after exposure, to immerse them in a nitrate of silver bath for some time before they are put into the ferrous, gallic, or pyrogallic developing bath, or, instead, to immerse them (after exposure) first in a nitrate of silver bath, then in a tartrate, oxalate, or phosphate of soda bath, to precipitate the silver oxide and prevent its being washed away into the developing bath, and then transfer to the developing bath, which need not in this case contain any silver.

I believe that the plan which I see has been lately adopted by several photographers, of adding chloride of ammonium to the washing water is, though no doubt useful, still so far a mistake, the chloride is infinitely better introduced, as I have recommended, in the *collodion* itself.* N.B.—It will not do to employ any of the potassium or iodine salts in iodising or bromidising this collodion, or we are apt to have a precipitation of the chloride of the base in the collodion.

A similar mixture of bromide, iodide, and chloride, would appear to have some advantages in salting albumen for the ordinary old albumen-film processes on glass, or on wax-paper, and it would appear that the addition of a little caustic ammonia to make the albumen flow more readily on the plate or wax-paper, or gutta-percha (a similar paper), may be very useful.

For Albumen Negatives, on glass or on waxed-paper (or on paper prepared with paraffin, gutta-percha, gum lac, amber, copal, or other resin or allied substance in solution).

Prepare the albumen with iodide and bromide of ammonium or potassium as usual,† and then add to it in proportion to every 166 grains of iodide of potassium (a similar quantity of iodide of ammonium) any one of the following:—

1 eq. Common phosphate of soda
223 grains Dipyrophosphate (crystals)
1 eq. Metaphosphate (glacial)

Sensitise as usual, wash in plain water and dry. Common salt also may be added.

* While giving the other as a view well worthy of consideration, I considered the action of the vegetable matter, along with the nitrate of silver, as a more probable explanation of the results obtained. My experiments with *gum* and gelatine in the silver bath were (though interrupted) commenced precisely to see whether, not only with, but without bromides or iodides, or chlorides, it might not be possible to develop a picture, after washing with water (or *slightly* ammoniated water), with the ordinary developers, or the following solution:—

Water	1 ounce.
Tartrate of ammonia or potash	60 grains.
Sulphate of iron or manganese	10 „

Liquor ammoniæ till fluid begins to smell.

And their object was to show whether the nitrate of silver could not be made to act, under solarisation, towards these soluble vegetable matters, precisely as ferric or uranic nitrate, or bichromate of potash, or certain other salts appear to do.

The metallic silver hypotheses would require to prove it, to take a sheet of prepared paper, expose one-half, keep the other in the dark; analyse both, beside the preliminary experiment of showing that even an alkaline silver solution, containing *also* manganous or ferrous sulphite, was unable to develop an image on it.

One palpable *prima facie* improbability of the metallic hypothesis is this, that while even pure white substances, when very finely divided, become apparently black, witness the black cavities found in quartz and plated metals in a state of very fine division, &c., very generally become either black, purple, or darker in colour. We have, as far as I know, no instance at least of any simple substance which becomes lighter in colour when finely divided, though black marble, slate, &c., do certainly become lighter in colour when pulverised. Still there is no absolute *à priori* reason why a finer pulverisation may not produce white again. Recourse should thus far be had to testing the image, first for silver, second for *iodine*, with starch and nitric acid (or nitric acid alone on a French paper?); and thirdly for nitric acid, with sulphate of indigo.

† Either pure collodion or collodion containing also resin cereoline or paraffin being employed. I am inclined to think that the introduction of a little alkali, forming an alkaline resinate, and after immersion a resinate of silver oxide, into this collodion might be an advantage. The resinates of silver are soluble in alcohol but *in*soluble in water.

* The cyanides, ferrocyanides, and the other various complex cyanides should be tried in the wash water.

† Say two equivalents of iodide to one of bromide.

PHOTOGRAPHIC VISITING CARDS.

The fashion of photographic visiting cards continues to spread more and more every day. The skill of the artists who devote themselves to this *specialité* is great, and tends vastly to popularise it. The original form under which the photographic visiting card appeared placed the portrait in the centre, with or without the name in the lower margin. A specimen before us consists of a visiting card, of the usual form and dimensions, bearing the name and address in the ordinary way, only in the corner where titled persons usually place their crest and arms the engraver designs a little frame, no bigger than the stone of a seal-ring, within which is placed a portrait, almost microscopic, but quite recognisable.

These portraits are sometimes taken full length, and, according to the fancy of the original, the attitude and expression may be infinitely varied. A morning call, a visit of ceremony, congratulations, condolences, return to town, or departure, every form of visit has its appropriate photographic expression.

M. Delessert, the amateur who originated this idea, has hit upon a happy expedient connected with positive printing. While travelling, his servant, who occupies the "dickey" of his carriage, sat with folded arms, idle, thinking, probably, only of mischief. Now, before starting on a journey, M. Delessert places in his hands a printing frame and a negative, with a portfolio of sensitised paper, and employing the roof of the carriage as a working bench, he prints his proofs as he goes along, without fatigue or disturbance: thus at once occupying his hands and his thoughts, and developing in him a feeling for art. The idea is certainly very original and ingenious.

M. Delessert, who is no less skilled as author as well as photographer, has had his travelling carriage fitted up as an atelier—so compact and convenient, that even, when in town, he prefers it to any other. We hope to be able soon to describe this gentleman's labours at the hospital of Lariboisère, which give us a very high notion of what photography can accomplish in its applications to medicine.—*La Lumière.*

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. II.

PHOTOGRAPHIC operations are as attractive to the popular mind as a sugar-cask is to the flies. No matter where you plant your camera, on barren moor or sedgy vale, in a deserted village or a ruined city, in the desert or by the sea-shore, out of reach, as you suppose, of human ken, and are hugging yourself with the idea that you are alone, when straightway up pops one head and then another. Where they come from you cannot guess; they seem to grow out of the earth like mushrooms. When I put my head under the focussing cloth there was no human biped in sight except my dragoman, who looked with silent awe at my mysterious operations. When I withdrew my head, after obtaining a satisfactory focus, I found myself the cynosure of neighbouring eyes, to the extent of some sixteen wild-looking Bedouins, arranged in a semicircle, at about ten paces distance. My surprise was so great that I lost my presence of mind, and I suspect my countenance exhibited some tokens of fear, although I was not afraid, oh no! not at all, though I did look round for John. I suppose that, seeing my confusion, they concluded I was after no good, and after holding a consultation among themselves in (to me) an unknown tongue, as quick as thought the strongest and boldest of the gang rushed at my camera, lifted it up, tripod and all, and quickly strode away in the direction of the city, while the others seized every thing lying around and followed him. I turned to my dragoman, but he looked on quite unconcerned, as if what occurred was a matter of course. My first impulse was to cry "stop thief!" but a sense of the absurdity of such a proceeding soon came over me; so I made up my mind that the best thing I could do would be to follow on and see the game played out. The rascals never once turned their heads to look at me, but kept on their way with quickening pace. I had but one hope — that we might meet John, who had gone early in the day to explore the city.

In about twenty minutes the city was reached; the party halted at a bazaar, while one of them moved off, as if in quest of something. We were soon surrounded by some fifty half-naked citizens of Gaza, who divided their attentions between the camera and myself. My stock of Arabic consisted of one word — *Bekam*, which, being interpreted, signifies "how much?" Seeing a basket of oranges for sale near where I stood, and being exceedingly thirsty and choked with dust, I essayed my linguistic skill. It is all very well to be able to ask a question, but it is also necessary to understand the answer when it is made. *Arba* was just as intelligible to me as *ouahed*, so I did not know what to make of my answer when I got it. I then tried with my fingers, but with no better success. The Arab cannot interpret signs made by any other nationality. My attempts to make myself understood were received with shouts of derision. It was but too evident that, in obedience to the prophecy, the king had long ago perished from Gaza.

Matters seemed to be getting critical. I expected nothing less than that these gentlemen would treat me as mischievous boys frequently serve a stray dog:—tie, not a tin kettle, but my camera, round my neck, and chase me through the city, running "a muck." And I verily believe to this hour that such was their intention.

I gasped, in horror and despair, "Where's John?"

A sudden movement behind me, a turning of all eyes in that direction, caused me involuntarily to turn my head also. O welcome vision! There was good John, his herculean frame looming up above all the rest, with one hand gripping the throat of one unbeliever, and the other grasping the shoulder and holding at arm's length another. With a jerk he sent them both reeling; during their course, they overturned all they came in contact with, and soon some half-dozen of my foes were lying prone on mother earth. This style of argument seemed to have a very salutary effect: the living circle, which had grown uncomfortably narrow about me, immediately took a considerable expansion, and I could breathe more freely. Meanwhile, John had drawn a revolver from each of his side pockets, one of which he handed to me, keeping the other himself. "Don't fire," said he, "before I do; we are good for twelve shots, if you keep cool."

I was not very eager to shed a fellow-creature's blood, and only the certain prospect of destruction would have prevailed upon me to pull a trigger. I flattered myself that the sight of the weapons would have a salutary effect upon our foes, and check further aggression on their part. There was a parley. John thundered out his anathemas upon the Moslems, who sneaked away behind each other as they best could, when lo! "Room for the Governor!"

The Pasha, in the nick of time, came to the rescue. Finding myself in the presence of this worthy functionary, I bowed profoundly to this degenerate representative of the decayed royalty of Gaza; the representative bowed to the ground, placing his hand on his breast, chin, and forehead, in the most approved oriental style, to signify the depth of his degradation. After a volley of suppressed grunts of profound admiration and respect, mingled with "*Salaam Aleikoum*," the Governor waved his hand to disperse the assembly, and backing up against a shop front, gathered up himself and his robes upon it, and motioned us to a seat on the opposite side of the narrow street. We took possession of two of the little shelves, which I suppose I must in courtesy call shops, and then came pipes and coffee! Heaven only knows where coffee comes from in such places: you might suppose the Pasha carried a portable coffee-shop about with him. No matter where he is or where you meet him, in the street, in the desert, on the mountain, down he sits, and you sit down, and forthwith the tiny cup of coffee, aromatic, glorious coffee, Mohammed's wine! comes smoking hot to burn your lips and soothe the nervousness you naturally feel at the illustrious presence in which you find yourself.

I stated the case to John, and John related it to the Governor, with becoming indignation. That worthy functionary was incensed at the treatment the Howajjis had received. The offending culprits were led forth, and we were asked what punishment we wished to be inflicted upon them. Thinking they had acted from mistaken zeal, I begged they might be forgiven, on condition that they carried back my traps to the place they had taken them from. As soon as this sentence became promulgated, a shout of triumph was raised; my camera was shouldered and already on its way back to our camp, when I suddenly found myself lifted from the ground upon which I was standing, and hoisted upon two men's shoulders, with a mob of wild, howling, dark-visaged attendants madly capering around.

Talk of Eastern gravity: it is the gravity of a boarding-school miss in presence of the lady who teaches her "deportment." See the same prim miss at her romps! The Arab, under the influence of excitement, is more than a match for any uncaged animal.

Fortunately my traps sustained no injury. My losses were confined to a sheet of waxed-paper. Some inquisitive Moslem had opened the slide, and saw — nothing!

Next morning we dismissed the camels with which we had crossed the desert, and hired horses and mules. In the cool breeze of early dawn our cavalcade rode down the Zim Zim to Askelon, on the sea-shore, to the north of Gaza.

I quitted Gaza with reluctance. Its high antiquity had an unspeakable charm for me. It must have been one of the earliest cities of Palestine, for it is mentioned in Genesis with Sodom and Gomorrah. As the southern barrier of the Holy Land, it was always held as a place of some importance. It stood in the highway of the armies of ancient days: every conqueror who marched from the north into Egypt halted at Gaza. Cambyses took it. Alexander spent five months before its walls. The soil around is fertilised with human blood, which in every succeeding century has been poured out upon it, serving to nourish the luxuriant olive, which thrives and grows rich around.

Askelon, no less celebrated in modern as in ancient history, was once a great city. The ruins of its quays and wharves and breakwater, bear witness to its departed greatness. But now it is only a miserable village, destitute alike of trade, commerce, wealth, and almost of name.

We pitched our tents amid the ruins of the ancient city, and took our dinner on the sea-shore; cooling our wine in the hollow of a stately carved capital, into which the crisp foam dashed at every fifth wave. All the gallant deeds of Godfrey and of our brave Richard on these hills and in the valleys rushed into my memory. No more gallant deeds in the world's history are recorded than were done for the Cross and the Sepulchre on the fields of ancient Philistine glory. As I slept at night on these fields I could fancy myself one of Richard's host, and repeople the scene with the noble forms of the Crusaders who lie enshrouded in the dust beneath my feet.

We slept to the lulling sound of the surf, and rode next morning by way of Ashdod to Ramleh. Ashdod was the city to which the Ark was carried by the Philistines, and which suffered so terribly the curses of an offended God for their sacrilege. D. T.

Meetings of Societies.

LIVERPOOL PHOTOGRAPHIC CLUB.

THE usual meeting of this Club took place on Tuesday evening last. Although the last three meetings have been but thinly attended (probably on account of the favourable state of the weather for out-door operations), the interest is fully maintained.

Mr. FORREST exhibited six views taken by the turpentine waxed-paper process, by Mr. Hooper, of Manchester, which were much admired for their artistic selection and excellence as photographs, the only drawback being the amount of exposure required.

The Rev. Mr. BANNER exhibited some exquisite stereoscopic pictures taken by the Fothergill process. He stated that his operations had been attended with much more uniform success since he had adopted the one-grain washing bath; and by the advice of Mr. Shadbolt he had also materially reduced the proportion of albumen, using one part to four of water with great advantage. The addition of the chloride to the gum solution had also given in his hands excellent results, with a much shorter exposure.

Mr. KEITH exhibited and explained a very neat stereoscopic camera, sent by Mr. Newton. The camera slides along a bar about fifteen inches long, moving upon a centre, and the necessary degree of convergance is shown by means of an index and scale upon one end of the table. He also reported very favourably upon one of Derogy's lenses, which he had procured for a customer, having tried the various combinations, and found them fully to warrant the favourable opinion previously published in THE PHOTOGRAPHIC JOURNAL. He strongly advised all photographers using wet collodion to put their apparatus upon wheels, and stated that the 12 × 10 pictures exhibited by him upon a previous occasion had all been taken in the combined wheelbarrow tent which Mr. Brown had sent to him to try.

A MEMBER called attention to the disgraceful extent to which Sunday photography is practised in Liverpool. On the preceding Sunday he went out to judge for himself, and in a walk through a limited portion of the town he found TWENTY-SIX places of business fully open without the slighest attempt at concealment. The subject was one in which the credit of all engaged in photography was concerned, and he thought it a subject fully worthy of the attention of the Club.

Mr. FORREST, while fully admitting the importance of the subject, thought that it was not one in which the Club as a Club could move, but as it was certainly illegal, the power to put a stop to it lay entirely in the hands of the police. In Leeds, by the combined efforts of the magistracy and police, it had been entirely put down. He was glad the subject had been broached, and requested that the report of the discussion thereon should be forwarded to Mr. Shadbolt.

After an interesting discussion, and the exhibition of numerous specimens, the meeting separated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

WE are glad to find that this as yet young Society progresses favourably, the number of members increasing, and many candidates for election are expected to be on the list by the next meeting, which is fixed for the 20th October next. This is no more than might have been expected from the fact that the officers and members of committee are all practical men. As the name of one gentleman was accidentally omitted from the copy supplied to us on a former occasion, we give the whole again complete, viz.:—

President — The Rev. F. F. Statham.
Vice-President — Mr. W. Ackland.
Hon. Secretary — Mr. A. H. Wall, 90, Cannon Street, City.
Treasurer — Mr. F. Howard, 5, Studley Terrace, Stockwell.
Committee — Messrs. Hannaford, Hervé, Clarke, Leake, Sen., Cotton, and Leake, Jun.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER III. *(Continued).*

Cobalt Green — Prepared from cobalt; permanent both in oil and water; very pure, but of little power; works well.

Sap Green — A most agreeable, clear, transparent colour, prepared from vegetable sources; much used, and working well in both oil and water, but, alas! fugitive.

OF PURPLE PIGMENTS.

Purple is nearly related to shade, of which it is very frequently the representative, although poets have associated it with imperial pride and royal grandeur: hence, perhaps, the vulgar idea of purple is by no means correct, but rather tends to that of crimson as being the most gorgeously suggestive of regal splendour; purple, however, has a solemn grandeur of its own, very characteristic of the mingled awe and reverence commonly animated by the consideration of royal attributes. Purples are generally compounded by the painter himself during work; consequently, I shall describe but two of these pigments, viz.:—

Madder Purple — A very rich, beautiful pigment, permanent, of good power and body, and working well in oil and water.

Purple Lake — A very bright colour, but fugitive; prepared from cochineal.

OF ORANGE PIGMENTS.

Orange is a very warm and splendid colour, suggesting light and warmth to the mind; it comes prominently forward* in a picture, and is associated with gaiety, cheerfulness, and splendour. Orange pigments are not numerous.

Orange Chrome — Chromate of lead, a beautiful colour, but it does not stand very well; is used in both oil and water. A similar preparation is sometimes called "*Mars Scarlet.*"

Orange Vermilion — A very eligible colour in oil and water, but works badly in the latter, in which a little gum should be added to it. It is permanent and of great use.

Orange Ochre or Spanish Ochre — A durable and useful pigment in oil or water.

Burnt Sienna — A sober semi-transparent colour, hardly to be called orange; although generally classed with such pigments, it is raw sienna burnt; is quite permanent, and is very generally used both in oil and water.

OF CITRINE PIGMENTS.

Citrine, or citron pigments, being broken yellows, represent in a minor degree the sentiments associated with yellow. Original pigments of this class are but few in number.

Brown Pink — A vegetable lake of a fine rich colour, very transparent, and working well in both oil and water, although it dries badly in the first; is fugitive.

Raw Umber — Another of the honest old ochre family, very eligible in both media.

~~*Bistre* — A rich colour of great service in water, but drying very~~ slowly in oil; prepared from the soot of beechwood.

OF RUSSET PIGMENTS.

The sentiments associated with "russet" may be briefly alluded to in the same manner as the preceding, viz., as partaking, in degree, of those belonging to that primary colour, to which it is most nearly allied.† The only pigment under this denomination which I use, is called

Madder Brown — It is a very eligible pigment, perfectly permanent, and universally useful in every branch of the painter's art; its preparation is indicated by its name.

OF OLIVE PIGMENTS.

Olive pigments are few and but seldom used.

OF BROWN PIGMENTS.

Brown is the name applied to a class of pigments greatly varying in character, according to the proportions of the colours which combine for their formation, but to which none of the denominations already given could be justly applied. These pigments are very numerous.

Vandyke Brown — A rich, deep, transparent brown earth, almost as celebrated as the painter whose name it bears. It is durable, works well in water and oil, but dries very tardily in the latter.

Burnt Umber — A pigment composed of manganese and iron, dries quickly in oil, works well in water, is perfectly durable and very useful.

Asphaltum — Used in oil only, and in this but little, although its clear transparency and beautiful colour are strong temptations to the painter; it is durable, but variations of temperature cause it to crack in every direction; factitious asphaltum is produced by the distillation of coal at the gas factories.

Sepia — Prepared from the sepia or cuttle-fish; very celebrated among water-colour artists, and deservedly so, as it washes beautifully, is perfectly permanent, combines well with other pigments, and for numerous purposes is pre-eminently useful. In oil, however, it is less used, in which it dries very tardily. Two different prepa-

* When I speak of advancing colours I mean such as would be seen more distinctly than others at a remote distance, or those which in any receding object would be longest in sight.

† This remark is of course applicable to all the colours and hues compounded from the three primaries, however broken they may be.

rations are sold, called respectively "cold" and "warm" (the latter being compounded with perhaps a little lake or other warm colour).

Indelible Brown Ink — A pigment very useful in water, as it is not disturbed after application by washes of other colours.

OF GRAY AND BLACK PIGMENTS.

Gray is the name of a class most nearly related to black. Grays are cold, retiring, and associated with shadow; their use, however, is great, and in every object of the painter's study grays (or greys) occupy no small space and attract no small share of his attention. The beauty and general effect of all warm colours derive force from contrast with gray, which also give it fresh value; the eye finds it soothing, and the absence of grays in a painting are signs of the artist's want of truthfulness.

Neutral Tints — Prepared chiefly for water-colour painting. As they are variously composed from other pigments, it would be useless to describe their properties.

Ultramarine Ashes — Very excellent pigments, possessing the same properties as the genuine ultramarine, being composed from the same material; they are extremely useful in obtaining the pearly tints of flesh, &c., in oil and water.

Black Lead (a form of Carbon) — From which, with white, may be compounded an exceedingly fine gray, pure and quite permanent, and possessing the capital quality of blending well with all other colours; used in oil only.

Ivory Black — Burnt bone, a fine neutral pigment, eligible for water and oil; permanent in both, but drying somewhat slowly in the latter.

Lamp Black — The soot of burnt resin, a very intense black; permanent; used in water and oil, but dries very badly in the last named.

Blue Black — Which I use in oil with my white, to destroy the tendency to yellowness derived from the vehicle employed; it exercises a preservative influence upon the white, both chemically and in the matter described; dries well.

Mineral Black — Used in oil for compounding grays; is perfectly durable, and dries very quickly.

Indian Ink—Used in water; is too well known to need describing.

As there are pigments fugitive under ordinary circumstances, but extremely serviceable, and capable of being rendered permanent by extreme or studious care, and as there are many colours which, although permanent in themselves, exercise a destructive influence upon other pigments, it is advisable that the earnest and conscientious art student should make himself better acquainted with the subject to which this chapter is devoted than in this series of articles I can hope or pretend to do. I would therefore recommend the study of George Field's *Treatise on Colours and Pigments*, published under the title of "Chromatography," from the preface of which I extract this paragraph, as a statement no less applicable to the present than to the time of its first publication:—

"Among the means essential to proficiency in painting, none is more important than a just knowledge of colours and pigments—their qualities, powers, and effects; and there is none to which the press has hitherto afforded fewer helps. There have appeared, it is true, at different times, several works professing this object, and most of our encyclopædias and books of painting treat cursorily on this branch of the art; but not only are these for the most part mere transcripts of the same obsolete originals, unsuited to the present state of the art,* but they are inadequate, irrelevant, and often erroneous, or untrue, as every one acquainted with the subject is aware."

But while strongly advising the student to make himself well acquainted with pigments, let him always avoid a class of painters who, as Shee says,

"Their time in curious search of colours lose,
Which, when they find, they want the skill to use!"

PROGRESS OF PHOTOGRAPHY.—The War Department has lately made arrangements for forwarding photographic apparatus to every military station in the empire, for the purpose of taking views of coast-lines, fortifications, &c., for transmission to head-quarters. Among recent applications of the art is that to the ornamentation of flat surfaces of salvers, urn-stands, cake-trays, and similar objects. The photograph is covered with stout glass, so closely fitted that, at first sight, the eye is led to believe that the ornament has been painted on the china or wooden frame wherein it is set.

* And more particularly to the requirements of photographic colouring.

Letters to a Young Photographer.

No. XV.

MY DEAR EUSEBIUS,

If ever I make another photographic excursion in the middle of July again it shall be at the Antipodes, where the thermometer ranges something under 90°. I think we have had a nice time of it truly. Like the weird sisters in *Macbeth*, when we met, it was 'mid thunder, lightning, and rain, to say nothing of hailstones as big as oranges. My face—bah! I am ashamed to look in the mirror; I look like a Red Indian, painted with red ochre for the war-dance. The cuticle, blistered by the sun, is all peeling off, and my hands are of the colour of burnt umber. My coat has got many holes in it, and so have my breeches, through scrambling under hedges for shelter from the pelting storms.

As for you, you seemed to like it; it was rare fun for you to get soaking wet to the skin, three or four times a day; but you are young, and can afford to laugh at the little miseries of life, and have no fear of rheumatism before your eyes; but my arms feel as if they had been stretched on a rack for four and twenty hours.

But when I look over my portfolio of the negatives we took I feel that there is compensation for all the inconveniences we have suffered. What splendid effects we got when a dense black thunder-cloud formed the background of our pictures! I fancy how the knowing ones will stare when they see Eusebius's productions in the next exhibition. One thing is yet lacking: a photograph of a flash of lightning, which, under auspicious circumstances, may possibly be obtained by Mr. Skaife's instantaneous process. I do not despair of obtaining a good representation of forked lightning, for I am sure some flashes we saw lasted nearly a second.

I shall now essay to enlighten you upon preservative processes and dry collodion, with kindred contrivances, which have for their object the postponement of the development, which, in the employment of wet collodion, must be effected immediately the picture is taken.

To retard or prevent the drying of the collodion film it is necessary to mix with it some hygrometric substance, or to cover it with a coating of the like nature. To any one familiar with the operations of chemistry, various substances possessing hygrometric or deliquescent properties will readily suggest themselves; the only precaution necessary to take being, that the preservative substance selected shall produce no chemical decomposition either in the nitrate of silver or the iodised collodion. A person unacquainted with the vagaries of photographers would naturally conclude, in looking over the list of substances proposed as preservatives, that photography was a section of the art of cookery; and a facetious friend of mine (not Erasmus) threatens to publish a half-crown book on "Photographic Cookery;" but I assure him there is one already, although it does not pass under that title.

First in chronological order among "preserves" stands, I think, nitrate of magnesia, a very deliquescent salt, but which, upon trial, was not found to answer the proposed object satisfactorily. Honey, suggested by Mr. Shadbolt, was a great improvement upon this salt, and notwithstanding the introduction of various other substances, it still remains the best for the purpose. Oxymel, which is a mixture of honey and acetic acid, found great favour for a time; but I could never become satisfied that it was better than honey, pure and simple. Some experiments I made with glycerine were so successful that I cannot understand why this substance has not been received into favour as a preservative agent. I attribute the cause of failure to the employment of a sophisticated article.

I do not think it necessary to enumerate all the substances which, like ephemera, have enjoyed their brief hour of existence: each was thought best by its inventor (!) But to show the infirmity of the photographic mind, I was challenged to mortal combat by one pugnacious individual, because I presumed to deny the efficacy of, or the necessity for, the "raspberry-syrup process;" but we have thus far done without it, and are likely to continue independent of it.

From the first day that I worked with collodion up to the present time, I have made it a rule to put into my nitrate of silver bath as much loaf sugar as I put nitrate, and I am sure I find my advantage in it, for I can sensitise half-a-dozen plates in advance, and expose them in the camera, without stopping to develop until all are ready. A sensitised plate, if left in a horizontal position, will keep in good condition an hour or more. Honey added to the nitrate bath proves just as efficacious. Honey and sugar in solution act in the same manner; the crystallising property of sugar is destroyed when mixed with nitrate of silver. A bath containing sugar or

honey must not, however, be exposed to the light or to the sun's rays, else the silver will be precipitated. Here is a formula I generally employ:—

Distilled water	10 ounces.
Nitrate of silver	5 drachms.
Acetic acid	2 "
Alcohol	3 "
Honey	2½ ounces.

(*Or* sugar, 5 drachms).

This solution will probably assume a yellow tint upon the addition of the honey: in that case add about an ounce of kaolin or fuller's earth, in powder, and filter. The collodioned plate must remain in this bath about a quarter of an hour, and, when drained, exposed in the camera, without washing. After exposure, the collodioned plate must be carefully washed in many waters, and then immersed in a simple nitrate bath for a few minutes before development. The development may be effected without this re-immersion, provided the washing does not remove all the nitrate of silver from the collodion film, or some nitrate of silver be added to the developing solution, which is made as follows:—

Water	10 ounces.
Pyrogallic acid	10 grains.
Acetic acid	1 drachm.

But what is called the "honey process" is different from the above, inasmuch as the honey is applied after the collodion film is sensitised and washed, by immersing the plate in a mixture of equal parts of honey and water. A plate thus prepared will retain its sensibility for several days. After exposure the plate is washed with water to remove the honey, and then developed in the usual manner.

Mr. Maxwell Lyte suggested a mixture of gum arabic and honey. The formula for his solution is —

Water	12 ounces.
Gum arabic	2 "
Alcohol	2 "
Honey	1½ "

The collodioned plate being sensitised, and drained as usual, it is placed upon a levelling stand, and as much distilled water poured upon it as will cover it. Pour off this water into a measure, and pour it on again, repeating the operation several times. Set the plate up on an angle on several folds of blotting-paper to drain, then pour on the solution containing the gum and honey. Pouring it on and off several times, as with the water, set the plate on an angle to drain, and leave it to dry. The exposure will need to be double that of ordinary collodion. Before development the plate must be washed, to remove the gum and honey.

Glycerine was proposed by Mr. Henry Pollock, in the proportion of ten drops to three ounces and a half of collodion, and, in the sensitising bath, one ounce of glycerine to every five ounces of water.

A second sensitising bath consists of eighty-five parts of water, fifteen parts of glycerine, and one part and a half nitrate of silver. The collodioned plate is first sensitised in the first bath, then immersed for a minute in the second bath, washed, drained upon blotting-paper. Plates thus prepared will retain their sensitiveness for a week. Before development the plate must be rinsed with distilled water; the developing solution is the usual pyrogallic acid. The sensitising bath is deteriorated very soon by the glycerine, and will require to be filtered and strengthened; it is therefore best to employ horizontal baths for sensitising, as they require a smaller quantity of the solution. The employment of glycerine has been perfected by Mr. Llewellyn, who operated with a pure sample of that substance.

I must also mention Mr. Maxwell Lyte's *metagelatine;* that is, gelatine brought to the condition in which it will no longer solidify or gelatinise. Metagelatine is prepared by boiling one drachm of gelatine in one ounce of water. When quite dissolved, add two drachms of water containing twelve drops of sulphuric acid; boil the whole for five minutes, and then set it aside to cool. This boiling and cooling must be repeated several times, until the liquid no longer becomes a jelly when cold; then the acid must be neutralised by the addition of chalk in powder, until it ceases to produce effervescence. A drop of creosote is to be added, to prevent mouldiness, and the liquid is filtered. Mr. Lyte then prepares a syrup as follows:—

Metagelatine	5 ounces.
Water	5 "
Honey	1½ drachm.

The collodioned plate is sensitised in the usual manner, then drained. Sufficient of the above syrup is poured upon it, and made to flow over the plate, then poured off. It will carry away with it most of the nitrate of silver; it must be thrown among the residues, and a second and a third quantity poured on, until the syrup spreads uniformly over the collodioned film. The plate is next allowed to drain and dry in the dark, and it will then retain its sensitiveness for several days. The exposure required will be double that of ordinary collodion; after which it is washed in distilled or rain water for a minute, and then developed and fixed in the usual manner.

Now, my dear Eusebius, I am not going to pronounce judgment upon any of the methods above described; each has, doubtless, its respective merits. I know that each has its partisans and advocates. It will be a delightful occupation for your ingenuity and industry to try them all, and let me know which you think the best. Give at least a week to each, else you may come to hasty and rash conclusions. There yet remains "dry collodion" proper; and the collodio-albumen processes will next engage your attention. Thus you will see there is work enough laid out for you to do, ere you can become "the accomplished photographer," armed at all points. When the claims of photography are fully recognised, I doubt not we shall see professorships established in our colleges and universities. When I see you installed in one of them, then shall I feel rewarded for all the care I have bestowed and intend to bestow upon you, and feeling my mission ended, prepare to depart in peace. I have not touched upon the æsthetic side of photography yet. The photographer requires not only the chemist's hand but also the artist's eye—a sort of sixth sense which is born with us, but which cannot be acquired, although, like the other senses, it may be greatly developed and cultivated.

Photographic Glossary.

Photogalvanography — A method of heliographic engraving invented by Paul Pretsch. A plate is coated with a mixture of gelatine and bichromate of potass, and exposed to the action of light under a collodion positive or negative. When afterwards washed with water the gelatine not acted upon by light is dissolved, leaving the surface in a state of inequality corresponding with the amount of action caused by the light. A mould is now taken from this in some plastic material, upon which copper is deposited by the galvanic or electrotype process, producing a plate or plates, from which any number of impressions may be printed at the copperplate press. A specimen of this art was given with No. 87 of this Journal.

Photolithography — A heliographic process by which the photographic image is obtained upon lithographic stone, from which impressions may be printed in the usual manner. It is the invention of M. Poitevin. The stone is covered with a solution of bitumen in ether, so as to leave a *grain* and not a varnish. Exposed to the action of light, either in the camera or under a collodion positive or negative, the bitumen becomes insoluble in those parts upon which the light has acted; the other portion is washed away with ether. The stone is then prepared in the usual way for printing, and inked, and if the operation has been carefully performed, will require no touching to yield good impressions. The process may be varied by covering the stone with a mixture of albumen or gelatine and bichromate of potass, and after exposure washing off the preparation, then proceeding to the inking, &c., as indicated above.

Photoglyphic Engraving — A process invented by Mr. Fox Talbot. It consists in coating a metal plate with gelatine and bichromate of potass, and exposing it to the action of light under a negative. The plate is not washed, but some finely powdered copal resin is sifted over it, and then melted by holding the plate over a spirit lamp. The object of this is to produce a *grain.* When cold the plate is acted upon by an etching fluid, which is composed of hydrochloric acid saturated with peroxide of iron. This liquid penetrates the gelatine where the light has not influenced it, but does not act upon those parts which are modified by the light. The etching is stopped by wiping off the fluid with a clean linen cloth, then rubbing the plate with a soft linen rag and whiting and water, to remove the gelatine. The plate is now ready for printing.

Pigments — The paints or colouring materials used in painting, frequently miscalled colours. Colour is the immaterial quality possessed by various material bodies which are termed paints or pigments.

Foreign Correspondence.

Paris, July 26, 1859.

MALBROOK is returned from the war; our swords are turned into reaping-hooks, and all goes merrily as a funeral bell. We have to mourn over lost friends sacrificed at the shrine of fiendish tyranny and ambition, over disappointed hopes and unrealised aspirations, and, like the tender snail, withdraw our heads again to bide our time. There is but one art—the art of war; but one science—the science of destruction. No invention recommends itself so promptly as that aimed against human life. The inventor of a murderous bomb, a destructive rifle, an annihilating cannon, is honoured and *fêted*. Your inventors of steam engines and life-boats may go and hang themselves; we can do without them.

Photo' was one of the busiest of the camp followers, and has come back laden with spoils. Solferino before the battle and after!—with a difference. Portraits of Generals, Turcos, Zouaves, Vivandières, adorn our albums—sad mementos of the dire necessity for war with its train of miseries! To-day I feel like the melancholy Jaques, and if the thermometer keeps on mounting, I shall soon become another Timon, and flee to the woods and rail there against mankind.

It is vain to look for much photographic novelty under the present state of the atmosphere. My ether bottles are all empty, and my collodion is gelatinised. I went into my *atelier* this morning very early, in order to prepare for a day's manipulating, but the sight that met me there prompted me to make a speedy retreat.

At the time parchment paper was introduced to the photographic world it was hoped and expected that it would be found extremely useful in photographic negatives. I cannot learn that it has been applied to that purpose yet. Meanwhile a little controversy has arisen as to who is the inventor of this curious substance. Its discovery has generally been attributed to Mr. Gaine; but M. Louis Figuier has put in his claims for priority, having discovered it, in conjunction with M. Poumarède, in 1846, and published it in a memoir on ligneous substances, in 1847:—

"We have arrived at the discovery of a new substance, which exhibits a very curious modification of ligneous tissues. It is the result of the primary action of sulphuric acid on lignin, wherein the resulting product precedes its transformation into dextrine.

"If a piece of bibulous paper is immersed in monohydrated sulphuric acid for about half a minute, and immediately washed in a large quantity of water to remove the acid and stop its further action, and then placed for a few moments in water containing a few drops of ammonia, a substance is produced which exhibits all the characteristics of animal membrane. When wetted it feels soft and greasy to the touch, like animal membranes soaked in water, and when pressed and glazed is very transparent. It will probably be found very useful in the arts.

"Analysis has shown the identity in chemical composition of this product, which we call *papyrine*, with lignin. Sulphuric acid, by its action upon the latter, causes it to pass into a new isomeric state; the action is therefore exactly like that effected in its conversion to dextrine."

It was in 1857 that Mr. Gaine took out his patent in England for *vegetable parchment*, which MM. Figuier and Poumarède had discovered and published ten years previously. The only difference in his method, if difference it can be called, consisted in adding a half volume of water to the monohydrated sulphuric acid employed by M. Figuier.

Mr. Warren De la Rue has come to the rescue of Mr. Gaine, and asserts that, although parchment paper may be obtained by following M. Figuier's formula of *monohydrated* sulphuric acid, it is due to Mr. Gaine to say that he has established the conditions necessary to obtain a material practically useful, the paper acquiring an astonishing cohesion when treated with a mixture of two volumes of monohydrated sulphuric acid and one volume of water. Mr. Warren De la Rue is convinced, by numerous experiments, that the only suitable proportions will be found to lie between the formula laid down by Mr. Gaine and a mixture of four volumes of sulphuric acid and one of water.

It is probably the great difference which exists between the products obtained by monohydrated acid and by diluted acid which explains, up to a certain point, how so interesting an observation has remained so long unapplied to the arts. It has taken no less than a dozen years to transform the scientific idea into a practical art, and establish it as a new branch of industry. Without the use of diluted acid it would be impossible to produce a single sheet of parchment paper.

To this communication Mr. De la Rue adds that he is ardently pursuing his experiments in celestial photography, and that he will soon be able to exhibit beautiful proofs of the stars.

M. le Comte Aguado has produced some very curious photographs taken from an elevation, so as to exhibit objects singularly foreshortened. Mr. Richbourg has varied the idea by taking vertical objects, such as the interior of the cupola of the Cathedral of St. Isaac, at St. Petersburg, which is painted by the Russian artist, Bruloff. J. P.

WAXED-PAPER PROCESS.—The progress of this important branch of the art of photography has been much impeded through the difficulty of obtaining white wax in a state of purity, than which few articles of commerce are more grossly adulterated. The articles used to adulterate wax are chiefly stearine and tallow. Their presence may be readily detected in the following manner:—Take one drachm of the sophisticated wax, and boil it for four or five minutes in one ounce and a-half of strong alcohol; set it aside for several hours to cool, then filter it. Upon adding some water to this solution, a flocculent precipitate will be thrown down if stearine be present; if the wax be pure scarcely any effect will be produced in the solution. By this means one per cent. of stearine may be detected. Tallow may be detected thus: take half a drachm of the wax and boil it for three or four minutes in three and a half ounces of a solution of caustic soda containing six grains of pure hydrate of sodium (NaO, HO); then saturate the mixture with a weak acid, and warm it. The wax will separate, and may be removed when cold, dried with bibulous paper, and weighed. It may then be treated with alcohol as above, and separated by the addition of water. This process will detect as little as one per cent. of tallow.

Correspondence.

PLATINUM AND PALLADIUM.

To the EDITOR.

SIR,—I forgot, or omitted, I believe, to mention in my last letter to you that, though not alluded to, I think, in my old articles in your Journal, as especially with reference to negative processes, I, at one of our meetings here, called attention to the advantages of both *platinum and palladium for toning negatives, both on paper and glass*, connected with the fact of the photographs so toned *transmitting* much less blue light than those toned by gold. I rather think (though I have not been able to lay my hands on the number) that the toning with palladium was mentioned in a letter of mine in the *London Photographic Journal* also, of some months back.

Did I mention that I had used *alkaline* palladium toning baths also? I am amused at the photographers already running wild after palladium here, though it was offered to them last winter by me, two bottles of it, as well as the metal, having been taken to the Society's meeting, and no one would have it; and I gave one of the identical bottles of it three days ago to one of our members, who was making inquiries about the "NEW *metal*," for toning.

The price per ounce of palladium, some £5 or £6 when I last inquired, is, as you will find noted in my paper, a serious consideration; but still we cannot, as I have pointed out, judge of actual experience certainly from this and chemical equivalents alone; and at all events, when used as a *developer* for the uranic and ferric papers, the palladium salts do seem to go very far. There the tint is generally brown or black,* but when employed in toning there does seem a rather greater variety of tints given; still there is often such a tendency to brown, as might make palladium salts useful in modifying the tint given by gold alone. The brown tint of platinum toning might also be used in the same way. We may get also very good results by developing an uranic or ferric print with both gold and palladium, either mixed or separately, in succession, palladium reducing gold from its solution. Palladium prints are readily fixed by weak ammonia or even by plain water, differing in the latter from silver prints; and the ferrous salts may be called in as an aid in the palladium-developed uranic and ferric processes, just as they are in the silver-uranic and silver-ferric, this being exemplified in one of my palladium specimens sent to (but not admitted into) the Suffolk Street Exhibition. Another mode of producing pure palladium, and what is more important, *pure platinum prints*, is the treatment of MM. Beauregard and Sella's, or mine, or any of the other ink prints, with *alkaline* solutions of the platinum (?) and palladium salts. The same plan may be of course pursued with an alkaline gold bath, but to little or no advantage, the chrysotypes (Sir John Herschel's ferric and my analogous uranic) being so very much simpler processes. The salts of rhodium, iridium, and ruthenium, also deserve trial in this way. I am, yours, &c.

July 14, 1859. C. J. BURNETT.

* Palladium, like platinum, seems capable of giving either a brown or black, according to circumstances — say according to the salts used or according to the state of combination or freedom in which it is deposited. When deposited on black apparently metallic silver, or when complete reduction is proved by presence of ferrous oxide, there is a tendency to the black (probably the metallic) form of it.

MALTWOOD'S FINDER FOR MICROSCOPIC OBJECTS.

To the Editor.

Sir,—I imagine from your having given a description of Maltwood's Finder in your paper, that you might care to know a simple mode of recording the numbers, by which each square may be sub-divided into 5, thus:—Supposing the following figure represents the particular square, if the object should be in the centre of the square, write merely the figures $\frac{20}{30}$ but if it should be in the corner *a* write $\left|\frac{20}{30}\right.$ if in *b* $\left.\frac{20}{30}\right|$ if in *c* $\left|\frac{20}{30}\right.$ or if in *d* $\left.\frac{20}{30}\right|$

a		b
	20	
	30	
c		d

Holloway, July, 1859. I am, yours, &c. RICHARD BECK.

HIGH POLISH ON PHOTOGRAPHS. — TONING BATH.

To the Editor.

Sir,—Can you, or any of your numerous readers, inform me by what process that beautiful polish is given to those fancy boxes in which the drapers supply pocket handkerchiefs, &c.? It is, I presume, a preparation of gelatine, but how applied I am anxious to know, as I think, if applied to photographic prints, it would much improve their appearance if not tend to preserve them from fading.—Waiting for information in your next Journal, I am one of your subscribers from the first, J. M.

P.S.—Whose toning bath do you think is the best? I cannot succeed with Hardwich's.

Cockermouth, July, 1859.

[The brilliant polish mentioned is not good for photographs, as it affords no protection from moisture. It is produced as follows:—A plate of glass is cleaned perfectly, and placed in a horizontal position. It is then covered with clarified ox gall, in a very thin film. Clarified gelatine, dissolved in hot water, is then poured on, and allowed to remain till cold, and set moderately firm. The print is then laid thereon, face downward, and pressed closely; afterwards it is thoroughly dried, when the print, with the film of gelatine firmly adherent to it, may be stripped off the glass.

To produce a very brilliant varnish that *does* protect a photograph, the latter should be well sized with clear gilders' size, attached by its edges to a flat board, and then French polished.

Hardwich's toning bath is a very good one, and succeeds in our hands perfectly. We prefer, however, Maxwell Lyte's, as somewhat more simple.—Ed.]

To the Editor.

Sir,—Will you oblige me by kindly replying to the following queries:—

1. Will kaolin injure the nitrate bath for printing if kept always in it, and the solution filtered off when wanted, and afterwards returned to the same bottle?

2. In replenishing the waste of the nitrate bath for printing and the nitrate bath for sensitising will the original proportion of nitrate of silver to the ounce be sufficient, the consumption of silver being balanced by that of the water? or does the silver waste more in proportion than the water, and therefore a stronger solution become necessary?

3. If a stronger solution be indicated, in what ratio should it be?

Bristol, July 19, 1859. I am, yours, &c. MEDICUS.

[1. It will do no injury.

2 & 3. Both should be replenished with solutions fifty per cent. stronger than their normal condition, as it is an established fact, beyond controversy, that *more* silver is abstracted than the equivalent for the fluid removed, though the *exact amount* of surplus varies with circumstances.—Ed.]

ANSWERS TO CORRESPONDENTS.

We have received from Mr. Burnett a specimen of his platinum toning. It is of a rich and pleasant brown tint, and altogether very agreeable except for an opacity in the shadows. It is, however, upon plain paper, and the defect may be one rather of manipulation than essential to the process. The formula is—

Bichloride of platinum	6 grains,
Soda	60 ,,
Water	8 ounces,

the proof having been fixed in hyposulphite of soda and washed *prior* to toning. This we consider a great advantage.

T. A. B.—See a paper by Mr. Burnett in the present number.

Alfred.—The best way of purifying a salt is by crystallising it—once, or more times.

Brutus.—You will perceive by our present leader that we think as you do on the matter mentioned.

Jas. Inchbald.—Perhaps Mr. Mayall's magnesian iodiser will answer your purpose.

T. R. S.—A minim does not weigh exactly a grain. The imperial minim weighs 91-100ths of a grain (·91), and the fluid drachm 54.7 grains, not 60.

W. Woodward.—We always acknowledge the receipt of communications, &c. Yours only reached us on the 27th ultimo. That you mention as previously sent never came to hand. Notice in our next.

C. R.—Why did you ask advice of a contemporary if you have no confidence in its editor? Perhaps you are doing the same with us. However, although we frequently differ from him, we in this instance endorse the opinion you say he has expressed.

Sambucus Niger.—Somebody has been hoaxing you, or you are trying the same upon us. Elder leaves for removing nitrate of silver stains are about as efficacious as linseed, said to be so by a French operator.

Interiors—You will find a dry or the honey process *better* for taking cathedrals and other interiors than wet collodion; the exposure that is absolutely necessary involves at least a partial drying of the plate. We have seen an admirable interior on a large plate that was exposed for *two whole days*.

W. W.—Hydrargyri bichloridum is popularly known as *corrosive sublimate:* it is a deadly poison. Hydrargyri chloridum is known as the medicine calomel. The best French chemists regard *calomel* as a *sub*-chloride of mercury, and corrosive sublimate as the proto-chloride, which often gives rise to confusion in translations.

Double Iodide.—Iodide of silver is soluble in a *strong solution* of iodide of potassium—not so, or rather but slightly so, in a weak one; hence, if paper be impregnated with the former, dried, and then immersed in water, the *excess* of iodide of silver is *precipitated in the pores of the paper*, and causes the primrose colour. It is an excellent plan for preparing calotype paper.

James Otway.—The article on colouring is by the gentleman whose name is attached to it—not a practised author, but a thoroughly practical artist, constantly employed professionally in that way. We believe it to be the most genuine and valuable article of the kind that has appeared in any photographic publication. You need not be afraid to follow the advice there given—there is no "book making" in it.

J. T. Field (Leeds).—The blue tincture of litmus is regarded as a true salt, resulting from the combination of a mineral base with a red vegetable acid. When strong acid is added to this tincture its base is separated, and the vegetable acid set at liberty, which then assumes its natural colour—a bright red. But if it is acted upon by a weak acid, which removes only a part of its base, there remains a salt with excess of vegetable acid. The colour is then purple.

H.—Your annoyance arises, probably from the collodions you name having a slight *alkaline* reaction, and this may be increased by the accumulation of organic matter in your bath. Test the latter with reddened litmus, and if it turns blue add a drop of *nitric* acid, and test again. Should no alkaline reaction appear, *boil* your nitrate bath for half an hour in a glass vessel or a common glazed pipkin; when cool filter. It is possible that you may have to resort to both of these remedies.

T. H.—The pamphlet on *Photography in Colours* was only printed for private circulation; we will, however, endeavour to ascertain if Mr. Burnett can spare you a copy.

Instantaneous pictures on *wet* collodion we have recently adverted to in our correspondence more than once. Back numbers for the current year are to be had of the publisher: you will find all the information you ask for in them.

Instantaneous pictures on dry collodion has also been noticed, and we hope shortly to lay before our readers some information on the subject.

Querist.—1. The probable cause of failure is, that your nitrate of potash was *not dried* before adding the sulphuric acid, or that the latter was of insufficient strength. Use the same acid as before, but with an increase of twenty to twenty-five per cent. in volume, and well dry the nitre before mixing. 2. Iodide of cadmium five grains to the ounce. 3. *Very* slightly acid with acetic acid. We shall be happy to see you.

M. D. (Sandbach).—We thank you for your kind and complimentary note; our position certainly involves much labour and thought, and we do our best to smooth away the difficulties of those less experienced than we happen to be, but we are fully repaid when we find our efforts appreciated.

The letters alluded to by you are written by a thoroughly practical operator, though we do not always quite coincide with the views he holds, especially as regards *toning*. For this purpose we consider Mr. Maxwell Lyte's formula decidedly the best as well as the most economical that we have used. That given by Mr. Burnett in our last also is theoretically perfect, but we have not personally tried it.

In Mr. Maxwell Lyte's formula one of the chief points to be attended to is to be sure that the chloride of gold is neutralised by carbonate of soda (forming thus a double chloride of gold and sodium) before mixing with the phosphate of soda. Keep a normal gold solution of the strength of eight grains to the ounce, one drachm then contains a grain of gold, which is ample for toning two large sheets of Canson's paper $22\frac{1}{2} \times 17\frac{1}{2}$ at least. Always mix your toning bath just before use, mixing only as much as you require, and we will answer for it you will not fail of suc sess with either plain or albumenised paper.

Have nothing to do with either iron or sulphur toning. For plain paper proofs we prefer Hollingworth's paper. You can obtain exactly what you want in albumenised paper from Mr. Spencer, Gold Hawk Terrace, Shepherd's Bush, and probably from others. What Mr. Spencer calls *new French paper* is what you appear to be seeking.

Received.—"J. B."—"C. J. B."—"M. D."—"O. G. R."

Errata.—In letter "On Development," line 4, for "*style*," read state. Line 8, for "*impenduelle*" read "imponderable." Line 9, after *actinisation*, omit the comma.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

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THE PHOTOGRAPHIC JOURNAL.

No. 100, Vol. VI.—AUGUST 15, 1859.

At the last meeting of the Liverpool Photographic Club a subject brought under consideration was rather pointedly referred to our special notice, we, therefore, feel bound not to pass it over in entire silence as we should have preferred doing, because entertaining, as we do, very great regard and esteem for the gentlemen forming that body, we certainly differ in opinion from the sentiments which the majority appear to hold on the point in question, unless we have misunderstood the same. The subject in question was that of Sunday trading in photography, a practice apparently somewhat prevalent in Liverpool, and one which many of the members considered it to be incumbent on photographers generally to oppose by repression.

In such an opinion we cannot coincide; we are opposed to coercive measures of every sort, except where any one transgresses the rights of his neighbour.

Respecting the theological view of the question, of course the pages of this Journal would not be a fit arena for the discussion thereof, and we strongly approve the decision of the meeting that, *as a club*, it was not its province to interfere.

As regards the legal aspect, if the law of the land be broken, it is surely the civil authorities who are the proper parties to redress the grievance if it exist; but we cannot admit that photographers, *as such*, have any thing whatever to do with the matter, and we have only noticed it now out of respect to the gentlemen who desired that our attention should be called to it.

British Association for the Advancement of Science.—Aberdeen Meeting, 1859.—We are requested by the local secretary to state, that in consequence of the suggestions made in our last, while framed and glazed photographs will be preferred by the promoters of the photographic exhibition to be held in connexion with the Association, they are also prepared to receive for exhibition unglazed photographs, simply mounted on cardboard. We feel convinced that this is a prudent concession.

In consequence of a sudden and severe attack of illness we have been obliged to avail ourselves of the assistance of a friend in preparing the present number for press, and we have to crave the indulgence of our readers for the consequent unavoidable absence of our usual preliminary remarks.

ON MODIFIED DRY PROCESSES.

By Major Russell.

Notwithstanding the great number of preservative processes now practised and recommended, I find them all more or less uncertain and imperfect. The collodio-albumen seems, on the whole, the least uncertain; but it has some disadvantages, of which, perhaps, the worst are, the liability of the dry albumen surface to contract stains from scum on the bath, the tendency to fogging which the plates sometimes show, and the difficulty of avoiding blisters. Fothergill's process has the advantage of admitting the use of a more sensitive collodion, without producing blisters; but in my hands it has given more uncertain results than the collodio-albumen.

The stains on the surface of the collodio-albumen plates can scarcely be avoided in some states of the bath; however carefully it may be filtered, a scum is formed by dipping the first plate, which stains the subsequent ones. The fogging seems to be produced by some soluble impurity, caused by the action of the nitrate of silver on the albumen, and which is liable to spontaneous reduction, especially in hot weather. This impurity may be removed in great measure by copious washing, but enough usually remains to cause the distance in a landscape view to develop too dark to print with the foreground.

The gelatine process is free from these objections, but has others of its own. If a collodion, made very powdery by age or the action of an alkali, be used, the plates are very insensitive, but work well otherwise. On the other hand, if a sensitive collodion be employed, the film blisters and becomes detached from the glass. If, again, to avoid this, the gelatine solution be made very thin, then the film is not kept in a sufficiently porous state to develop well. To cement the collodion film to the glass, I have tried a solution of india-rubber in benzole; but it does not adhere to the glass sufficiently. The addition of a little wax makes it adhere better, but it then dries with a coarse surface like ground glass. Gelatine has been employed as a preliminary coating; but it is soluble in the nitrate bath, and would probably contaminate it. Unaltered albumen on the glass would also have an injurious effect on the bath by contact at the edges, if not through the collodion. In order to avoid all these evils, I have lately employed three methods of working, which seem to succeed equally well. I have not yet tried them sufficiently to recommend any of them with confidence; but, as a considerable number of trials have given no failures, the details may be of interest to others who are experimenting in the same direction. The collodion is made from pyroxyline, prepared by Mr. Hardwich's formula for the wet process, dissolved in rectified ether and alcohol not weaker than s. g. ·805, the alcohol being in as large proportion as will work, the exact proportion depending on the strength of the alcohol and the bath: the stronger the alcohol the more may be used, but the more alcohol present in the bath the less will be required in the collodion. Add to each ounce of collodion six to eight grains of pyroxyline, and iodide of cadmium and iodide of ammonium, in equal parts, with one grain to the ounce of bromide of ammonium. The iodide and bromide may be used in weights nearly equal to the pyroxyline.

The exciting bath should not be weaker than 40 grains to the ounce, and may contain at least as much alcohol of ·830 as water. I have used a bottle made in about this proportion for several months, and it remains in good working order. Should the excited film show lines in the direction of the dip, let it set longer and move from side to side *immediately after dipping*. If this is not sufficient, add ether to the collodion.

The albumen is prepared by beating up white of egg to a froth, which on subsiding is poured into a bottle with a drop or two of essential oil of lemon peel: this preserves the albumen well, and diminishes its tendency to form bubbles. For the second and third methods, presently to be described, the albumen is improved by adding one drachm of nitrate of magnesia to each ounce, and thus prepared it is as good as any for the first method. The nitrate of magnesia, if very alkaline, should be dissolved in a small quantity of water, and cautiously neutralised with nitric acid, or it may crystallise on drying. It must however be neutral or slightly alkaline, as an excess of nitric acid would coagulate the albumen. For use dilute the albumen with as much water as will make it filter well; about equal quantity is generally enough, but it may be used thinner. Almost any albumen will answer, either iodised or uniodised; but for the second and third processes it must not contain sugar.

First Method.—Coat and excite the plate, wash in two or three dishes of distilled water, then in a dish of pump water. These waters may be used for a great number of plates without being changed. Then pour albumen across the end of the glass, incline

the plate so as to pour off at the other end into a measure, repeat this once, then immediately place in a dish of common water and wash about to remove the albumen; leave in the water until as many plates as are to be prepared have been brought to this stage. If the albumen be left too long on the plate before washing it will produce blisters. Immerse in a bath of about 20 grains of iodide of potassium to the ounce of water and as much iodine as will tint it as dark as port wine. Keep some iodide of silver (in the bottle) that it may be throughly saturated. A minute's immersion is enough; place in a dish of common water and change occasionally, or wash under a tap until the colour is nearly removed; then pass through the same waters which removed the nitrate, to restore the sensitiveness, keeping the plate a few minutes in the first water. After a few minutes in the common water, wash under a tap for a few seconds, and rinse with a little distilled water. Pour filtered cold saturated solution of gallic acid two or three times over the plate, and set up on one corner on blotting paper to dry. Should the film split off on drying, dissolve a small quantity of white wax in the collodion. If too much wax be used the film will set in clots, but in small quantity it appears to do no harm. Should the film become detached in developing, when dry paint one-sixteenth or one-eighth of an inch round the edge with any quick-drying varnish.

Second Method.—Coat, sensitise, and was as before; coat with the albumen, set up on one corner to dry (without washing off the albumen); when as dry as it will become spontaneously, immerse in a bath of alcohol of moderate strength, containing some iodine and iodide of cadmium, and saturated with iodide of silver. The proportions are of no consequence, so long as the solution is of a deep red colour; wash well, immerse in the nitrate washings, and in common water, and wash with gallic acid, as in the first method. This plan, though rather more troublesome, seems to give a richer picture, and I have not yet found the film to blister.

Third Method.—Begin by coating the glass plate with the albumen; set up on blotting-paper on one corner to dry spontaneously; then dip in the alcohol and iodine bath, to coagulate the albumen; wash, and rear up to dry. When dry, polish with cotton velvet rubber, coat with collodion, sensitise, and wash as before. After washing with pump water, rinse with distilled water, and pour on and off two or three times a solution of twenty to thirty grains of dried metagelatine (Maxwell Lyte's), and three grains of gallic acid to one ounce of distilled water, and set up to dry. Artificial heat must not be applied to plates prepared with gallic acid until they appear quite dry, on account of the varying solubility of gallic acid at different temperatures. Gelatine cannot therefore be used. This process is quite as sensitive as the others and developes better, and I think gives a rather softer picture. To test its power of resisting blisters, I made some very thick collodion, with alcohol and ether in equal parts, which formed a dense creamy film, filtered and prepared a plate with it within an hour or two, using metagelatine, thirty grains to the ounce; it developed readily, and showed no tendency to blister. A solution of iodide of cadmium, thirty grains to the ounce in water, with as much iodine as will dissolve, coagulates the albumen well, but I prefer the alcoholic solution. This, as well as the alcoholic nitrate bath, must of course be kept air-tight when not in use. Albumen, after being acted on by iodine, appears to be incapable of injuring nitrate of silver solution. The same nitrate washings may be used day after day for all the above processes, without any ill effects; whereas ordinary collodio-albumen plates would soon cause the water to discolour, and give foggy pictures.

The solution of iodide of potassium and iodine is an excellent cleansing liquid: a dirty developing glass, if rinsed with it, and then with water, is more to be relied on than if cleaned with nitric acid of moderate strength. The iodine seems to render any deposit totally inert.

ON BLISTERS IN THE COLLODIO-ALBUMEN PROCESS.

By Egbert Moxham.

I have tried every kind of collodion sold, and a great variety of pyroxyline, but I have not often found a preparation which would give in its *normal state* a film of the kind required, except by long keeping, or where the ether and alcohol, or one of them, contained water.

Collodion prepared with *pure* ether, *i.e.*, quite neutral and concentrated, and pure anhydrous alcohol, is very slow in acquiring a porous condition. I have some now by me prepared in January, with iodide of ammonium, which has hardly changed colour, although kept on the laboratory shelf without any extraordinary precaution.

When the ether and spirit contain water, and the pyroxyline is good for the purpose, a porous film is attained at once, but there is always more of a tendency to crapy setting, which renders it good for nothing in a short time.

The only plan which I find succeed is, to get a pyroxyline (if I can) prepared at high temperature, giving what you call a "short film" to iodise with ammonium, and then to add a few drops of liquor ammoniæ till the film becomes porous, and to use a separate bath for the collodion. The use of ammonia, however, requires some precautions, for if added to the stock bottle its action continues always, and to such an extent that the collodion becomes extremely rotten in a short time. I find it best to have a small bottle in this state, and to add a portion of it to the quantity of new collodion required for immediate use.

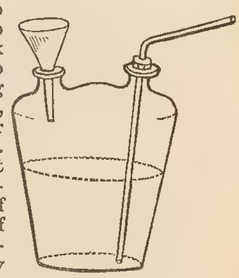
I find it also necessary to use a nitrate bath of full strength for collodion in this state: if the strength falls far short of 35 grains I get marks of all sorts on the plate, from irregular formation of the iodide. If these precautions, however, are attended to, the film is admirably adapted for the purpose. My experience leads me to believe that unless the albumen actually permeates the film so as to attach itself to the glass, blisters will be the general rule, so much so, that instead of submitting my collodion to the ordinary test I adopt the following:—I coat a plate and albumenise it as usual, dry and sensitise a second time, and remove it to a dish containing common washing soda in solution. If the film comes off easily with the finger and thumb and in flakes, the collodion is wrong; if, on the other hand, it requires a nail brush to bring it off the glass, I know that I shall never get a blister, excepting from a greasy glass. Nevertheless, there is one condition which it is necessary to observe, viz., that if the albumen be used *undiluted* the plate will require much working about in a bath before it will have fully permeated the film, and therefore I always use it very much diluted. If the porosity of the collodion film is merely superficial or showing a microscopic roughness, the albumen may attach itself to a great extent to the collodion; but unless the collodion in that case is very adherent to the glass the albumen will expand and raise the collodion in blisters when sensitised. You can never depend upon the process so conducted. According to my notions the following diagrams will represent the two cases.

No. 1. No. 2.

Atom of collodion. Atom of albumen.

In No. 1 you will never have a blister, because the albumen penetrates the collodion and fixes itself to the glass surface; in No. 2 you are most likely to get them from one or other of the following causes:—1st, the albumen detaches itself from the collodion; or 2nd, being firmly attached to the collodion, it pulls up the collodion film from the glass.

I use the following little instrument for washing off bubbles when the plate is albumenised in a dish.



It is simply a Woolf bottle with two necks. A bent glass tube, reaching to the bottom, is inserted through a cork into one neck, and a small funnel into the other, the filtered albumen being poured into the bottle by the funnel, and a muslin bag, if desired, to filter off any mucous threads in the liquid. The tube serves as a spout to direct a stream of albumen against any refractory bubble which will not wash off readily, and coming from the bottom of the liquid prevents the froth from escaping from the bottle so long as any liquid remains.

I feel sure that any one who will try a collodion sufficiently porous, albumenise in a bath with occasional movement, and use albumen with sufficient sugar or honey, will *never* find a blister in Taupenot's process if the plates are clean.

Before concluding these remarks I may mention that, although regarding a porous collodion as the key to success in this process, I have found lately that there is a quality of pyroxyline the very

reverse of the "powdery," which, when it can be met with, will give with anhydrous spirits a collodion film suitable for the Taupenot process. I cannot tell how it is prepared, but have occasionally met with it in French samples. Its qualities, when dissolved, are these: — it adheres to the glass with such extreme tenacity that on removal from the sensitising bath, the finger may be rubbed over the surface of the plate with considerable pressure without making the slightest impression. When the film is detached by the nail it comes off in a hard piece with irregular edges of fracture; it is perfectly structureless, and does not set ropy with the usual proportions of ether and alcohol. Collodion possessing these qualities will adhere to a well-cleaned glass with sufficient force to resist the expansive tendency of the albumen; but if the latter is applied without certain precautions there will be no combination, the collodion film being quite impenetrable, and consequently the albumen rises in blisters from it. It may be made to work as follows: the collodion must be thick and strongly iodised, and sensitised in a bath of full strength (say forty grains, otherwise the film will be uneven), and in the subsequent washings, instead of using distilled water, in the third cuvette a solution of iodide of potassium of ten grains to the ounce should be substituted. The surface of the iodised plate is slightly attacked, and sufficient of the iodide of silver is dissolved out of it to honeycomb it without perceptibly diminishing its opacity, excepting from an unusually prolonged steeping. The albumen will now adhere without any danger of subsequent detachment, and it may be applied equally well by pouring it over the plate, as often recommended, without the necessity of soaking in the cuvette.

[We think that the description of pyroxyline last mentioned by Mr. Moxham is prepared by a formula like that recommended by Mr. Hardwich, containing three measures of oil of vitriol to one of nitric acid, with the largest quantity of water possible. The product is not entirely soluble in ether and alcohol, and the collodion is very horny and adhesive.—Ed.]

ON IODIDE OF MERCURY IN THE COLLODION FILM.

By T. F. Hardwich.

(Continued from page 185.)

The following table, showing the effect of mercury on the darkening of chloride of silver, has been given to me by my friend, Professor Miller, of King's College. It has been known since the time of Gay Lussac that the precipitation of silver by chloride of sodium is interfered with by the presence of mercurial salts, and hence such a table is useful for reference in working the humid assay process:—

EFFECTS OF MERCURY ON THE PRECIPITATION AND DARKENING OF CHLORIDE OF SILVER.

Number of parts of mercury to 925 parts of silver.	Appearance of solution after precipitation.	Effect of light on the chloride for one hour.	Effect of light on the chloride for twenty-four hours.
·0	Clear.	Quite purple.	Dark purple.
1·0	do.	Purplish.	do.
2·0	do.	do.	Much coloured.
3·0	Faintly turbid.	Nearly white.	Shade of purple.
4·0	Slightly turbid.	Dead white.	Nearly white.
5·0	More turbid.	do.	do.
10·0	Very turbid.	do.	Dead white.

In my last paper mention was made of a nitrate bath measuring a little short of one pint, which had been thrown out of order by dipping plates coated with iodised collodion previously decolourised by mercury. Those of your readers who are in the habit of economising their waste solutions may perhaps inquire to what purpose this spoiled bath was eventually applied. The following process is the one which I have lately employed for converting old baths into solutions for printing. It is taken from a paper by Mr. F. G. Eliot, in the fifth volume of the Photographic Society's Journal, and proved quite successful in this instance, although I am not prepared to say whether the microscropic quantity of mercury supposed to be present in the bath was removed.

Make a solution of citric acid, containing sixteen grains in an ounce of water, and drop it into the spoilt bath in the proportion of a fluid drachm to each eight ounces by measure. If acetate be present in the bath the addition of the citric acid will produce a white precipitate, but in presence of free nitric acid the solution remains clear; the subsequent steps are the same in either case. Next immerse a strip of blue litmus paper, which will immediately be reddened; then add liquor ammoniæ drop by drop, until, after vigorous stirring, the blue colour of the reddened paper appears permanently restored. Now throw the whole on a paper filter, and when the liquid has run through, drop in an excess of pure nitric acid, sufficient to redden the test paper decidedly. Lastly, raise the strength of the bath to the proper point by adding thirty grains of nitrate of silver to each ounce.

No exact directions can be given as to the quantities of ammonia and nitric acid, but with the strongest liquor ammoniæ obtainable about two drops will be required for each drachm of the citric acid solution. The number of drops of the nitric acid must be varied according to the amount of the excess of ammonia.

The rationale of the process is as follows:—The citric acid, either with or without the aid of the ammonia, precipitates white citrate of silver in the bath, and this insoluble substance carries down the iodide of silver, previously dissolved in the nitrate of silver, and which, if allowed to remain, would interfere with the rapidity of the toning process. Excess of citric acid must not be permitted to remain in the bath, since it causes redness of the prints. Excess of ammonia, on the other hand, favours discolouration of the bath by use, and lessens the keeping qualities of the paper in hot weather, so that a trace of nitric acid is required to neutralise the alkali.

ON TAKING INTERIORS.

By Russell Sedgfield.

After all that has been said in favour of dry or sticky plates, it can hardly be questioned that wet collodion has great advantages where it can possibly be used, and I have been very desirous to apply it to taking interiors. The long exposure which such subjects require is a great difficulty in the way. The partial drying of the plate, and the concentration of the nitrate silver left on the surface, tend to produce stains which it is difficult to avoid in conducting the process in the ordinary manner. I have been trying lately to remedy this defect, and I think not entirely without success. The following variation in the usual method of preparing the plates is worth a more extended trial than I have been able to give it.

A bath is prepared in the usual way, but containing only ten or twelve grains of nitrate of silver to the ounce, and nearly saturated with acetate. I do not find it answer to make it much weaker. The plate, on removal from the usual bath, is immediately placed in this for a few minutes. If convenient it may be left for some time without injury. The rest of the process is conducted just as usual, using a pretty strong solution of pyrogallic acid, two or three grains to the ounce. If a plate so prepared is tried on a landscape, and developed almost immediately, it will be found less sensitive; but when the exposure is prolonged to ten or fifteen minutes, the difference in this respect between it and one prepared in one bath only will be found very slight, if anything; the risk of stains is much reduced, and a longer exposure may be given than could otherwise be ventured on.

The collodion for interiors should be rather thick, neither tough nor powdery, but something between the two—that is, spongy, so as to retain moisture for a longer time. I am not in the habit of making my own collodion, but endeavour to obtain this condition by the addition of more cotton and alcohol to what I purchase. It need hardly be remarked that for interiors a newly-mixed collodion is best, if potassium be used. If, however, cadmium is the iodiser, this is of less consequence, and perhaps for such subjects it has advantages. I generally use a mixture of the two.

Methylic collodion seems to be coming much into use. Some of our first makers have adopted it, judging by the smell. I rather doubt whether it is quite an innocent article. I have used it a good deal lately, and fancy that it gradually throws the bath out of order. The extreme heat of the weather may, however, have had something to do with this apparent effect. At any rate its cheapness entitles it to a full trial, and I shall be glad to learn the experience of others on the point.

I enclose a few specimens of the results of a two bath process for interiors.

[The stereographs sent exhibit the value of the suggestion made. They are far too good for a hasty review, and shall be noticed in detail in our next.—Ed.]

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

There are perhaps few persons who have not at one time or another experienced the delights of coming suddenly upon some well-remembered spot from which they have been long separated: the floodgates of memory are then opened, and a rush of mingled sensations is felt—of pleasure mixed with pain—in which the former, like good wine, is improved; and the latter, like its crudities, toned down by time. When these "green spots in memory's waste" are really beautiful in themselves, and not only so from associations connected therewith, of course the pleasure is materially heightened.

We experience these same joys to some extent (we may say to a considerable extent, and with the power of more or less renewing them at will) if we possess ourselves of well-executed stereographs of our favourite localities:—those where we have perchance wandered with some beloved one; where generous thoughts and noble aspirations have dawned upon us; where we have drank in renewed health from the life-giving air after a lingering attack of sickness, or where we have found rest and recreation for the over-tasked brain.

Again, how pleasant it is if we have not been able personally to enjoy our wonted trip, to see the spots that have delighted our dearest friend, our *fidus Achates*, and thus better comprehend the enthusiasm with which he speaks of that romantic mountain side, with the stream in the hollow, where he had the happiness of aiding the footsteps of the "lovely girl with the flashing eyes and slender ancles," none the less brilliant or the less lovely from the stimulus of our friend's presence no doubt.

It is such subjects as these, of which we have been *Dreaming in Print*, to which the series of views of Dovedale, in Derbyshire, recently published by Mr. Woodward, of Nottingham, belong. How different are they to the host of "got up" scenery trash, with its mock sentimentality, that acts almost as an emetic upon the beholder.

Apart from their stereoscopic value, the productions of Mr. Woodward have an intrinsic one of their own as faithful and pleasing transcripts of very charming scenery. Before noticing them in detail we may remark that the negatives are produced by the collodio-albumen process and executed with Mr. Woodward's well-known skill. In one or two the truthfulness of effect may be a little marred by slight over-development; not so the charm, however, for where this is the case the appearance of hoar frost on the ground is given, and that so naturally, that although we knew the cause *might* be what we have stated, we were so convinced that it arose from the frost being actually there in nature that we were only undeceived on reference to Mr. Woodward himself. When we mention that the negatives were taken "on a May-day morning early," when a portion only of the trees had put forth their leaves, the very natural appearance of this "pride" of the morning will be readily acknowledged; and lest our mention of it may be misunderstood as unnecessary faultfinding, we may observe that it is only apparent on two or at most three of the series, and that we scarcely regard it as a fault at all in the instances quoted.

In No. 74, *The Street Rock*, and 75, *Entrance to the Dale*, the frosted effect is noticeable in the former on the large dock leaves at the left-hand corner, and in the latter on the pathway amongst the grass, and on a picturesque rock standing out of the cool transparent water of the stream. Both are very pleasing subjects. No. 76, *Pickerill Torr*, is valuable as a geological illustration; as is also No. 77, *The Needle Rocks*—the latter being a particularly pleasing subject, and admirably executed. The brambles and other brushwood, with the velvety turf, form a fine contrast to the ruggedness of the gigantic rocks.

Of the entire series, however, No. 78 is our especial favourite. It represents the singular rocks called *The Twelve Apostles*, and is not only highly picturesque, but the execution leaves nothing to be desired. The graceful curve of the stream, the liquid effect of the water, the crispness of the foliage, and the remarkable contour of the weather-beaten rocks, rudely resembling human figures reclining against a bank—a resemblance heightened in one case by a small bush on the apex of the rounded mass of stone, presenting the appearance of curling hair—causes this slide to be peculiarly interesting.

In No. 79, the rock called *Dovedale Church*, the foreground is occupied by the stream, which reflects too much of the white light from the sky to be pleasant, and is, to our thinking, the least satisfactory by far of the whole. No. 80, *The View from the Lover's Leap*, completes a series with which all admirers of nature, where grandeur and softness contend for mastery, cannot fail to be enchanted.

AN ATTEMPT AT IMPROVEMENTS ON THE OLD ALBUMEN NEGATIVE PROCESSES.

By C. J. Burnett.

To be employed on glass or on waxed-paper, or on paper prepared with paraffine or solutions of paraffine, gutta-percha, gum dammar, copal, gum lac, amber, or other resin or allied substance in solution in alcohol, benzole, benzine, turpentine, camphene, or other solvent.

1. Prepare the salted albumen solution as usual* (or with addition of a chloride), but adding to it *further*, and in *addition* to the usual salt, common phosphate of soda (equivalent 358), or dipyrophosphate (equivalent, in crystals, 224), this addition being made in the proportion of one, two, or more equivalents for every equivalent of iodide which has been added.
2. Coat your glass plate or prepared paper by pouring on the albumen, or by floating alone on it, and then let it dry.
3. Sensitise with ordinary silver nitrate bath or with a rather weaker one, neutral or slightly acidulated.
4. Wash, dry, and keep in the dark as usual.
5. Expose in camera (or use for positive printing).
6. Develop as usual.

Further Remarks.—We may substitute for the phosphates *wholly* or *partially*, one of the organic salts, as oxalate of ammonia, or of potash (eq. 142 and 184), succinate of soda (eq. 136), Rochelle salt (eq. 121); and the following salts may also be named:—ferrocyanide of potassium, ferridcyanide of potassium, nitroprusside of sodium or potassium, cobalticyanide† of potassium, iodate and bromate, and periodate of soda, also cyanide of potassium. Much may not improbably be gained with regard to foliage, &c., from the ferrocyanides and some of its allies (in connexion with which see Mr. Hunt's *Researches*, page 129, &c.), using them either in the albumen as a substitute for part of one of the other classes of salts, or as a wash after sensitising.

Albumen has a great advantage over collodion in the variety of salts which are soluble in it, rendering it seldom necessary to have recourse to trimethylamene or other rare alkalies.

MR. KIBBLE'S INSTANTANEOUS PICTURES BY A DRY PROCESS.

By William Church, Jun.

These Pictures, which excited so much interest and speculation at Manchester, in Edinburgh, and here, prove to have been the exceptional results of numberless experiments from which Mr. Kibble has unhappily been obliged to desist from the state of his health. He has hitherto withheld any publication of his process from the commendable desire of being able to announce it with some certainty, but as he is now prevented from continuing his investigations he is unwilling that the germs of a method of obtaining such pictures as his *Empress Steamer*, taken on a dry plate in the fortieth part of a second, should remain unknown. I have, therefore, his authority for stating that the picture referred to and the greater number of his other "instantaneous" pictures were taken while experimenting with the arsenious salts of silver, and more especially while employing the arsenite. His results were, however, attended with too much uncertainty, and his experiments have been too incomplete, to admit of his stating how far the arsenious salts contributed to the sensitiveness of his prepared plates.

The process he employed was essentially that of Taupenot, and any deviations from its original simplicity have consisted mainly in the use of very thin collodion, containing arsenite of soda, and in the use of arsenite of soda along with a chloride in the albumen.

Mr. Kibble is disposed to attach a real value to his introduction of the arsenite of silver in the sensitive film, but I believe, and in this Mr. K. is inclined to agree with me, that his instantaneous pictures have been secured in the main by the substitution, so to speak, of development for exposure.

All these wonderful pictures of Mr. Kibble's were subjected to a very prolonged development, extending in some cases to ninety consecutive hours, and as some of them which contain trees, mountains, sea, and clouds, all perfectly delineated, are not indebted to any arsenical speciality in the collodio-albumen, the result must be attributed chiefly to the prolonged development. I may add, that the development was effected with a saturated solution of gallic acid in the usual way, the plate being supported, face downwards, and the solution and the containing glass dish being changed at intervals of an hour and a-half.

* Or with larger quantity of bromide.
† Also cuprocyanide and chromiocyanide.

THE BEST IODISER FOR COLLODION.

In looking over last year's volume of your Journal, I find at page 290, a letter from "Photo," on microscopic investigations of collodion. He there opposes the general opinion that Ponting's collodion is iodised with cadmium. In this he is partly right and partly wrong. Ponting's collodion is iodised with cadmium and calcium, the cadmium preponderating so as to produce a colourless collodion. Calcium, when kept separately, will often liquify and change to the colour of tincture of iodine, but in combination with collodion it is more stable than either iodide of potassium or iodide of ammonium.

A colourless collodion may look well and please many, but it is not necessary. A better iodiser than Ponting's is made with equal parts of the cadmium and calcium salts. The experience of three years with this iodiser has confirmed a professional photographer of my acquaintance in the opinion that it is the best he has ever used. Those who like ammonia can employ it in combination with the other iodides, in the proportion of ten grains of ammonium to twenty of calcium and thirty of cadmium. This is an admirable iodiser. For the collodio-albumen and Fothergill processes it would appear that cadmium is not the best iodiser, while it is universally admitted that iodide of ammonium is preferable with albumen. For use with those processes I should therefore reverse the proportions last given, and iodise with thirty grains ammonium to twenty of calcium and ten of cadmium. The last-named salt will prevent the liberation of free iodine in quantity sufficient to impair sensitiveness.

The objection to iodide of potassium is that it is impossible to procure it pure, and so long as this is the case it should not be used, as it is not absolutely soluble in collodion. It is a mistake to suppose this salt more sensitive than the others, the difference between them being scarcely appreciable, though cadmium must take precedence, both in point of sensitiveness and intensity. Cadmium has the merit of being the most stable of iodisers, and calcium ranks next, so that one cannot be wrong in using these salts in the proportions I have mentioned.

When bromides are to be used with negative collodion, it may be as well to iodise partly with ammonium, and in this case there should be three grains of iodide to one of bromide. The following will be found to work well:—

3 grains iodide and 1 bromide of ammonium	24 grains.
6 grains iodide and 2 bromide of calcium	
9 grains iodide and 3 bromide of cadmium	

This quantity will bromo-iodise six ounces of collodion.

I will only add that one of our most successful operators, the Rev. Mr. Cleaver, iodises his collodion as follows:—

Iodide of cadmium	15 grains	One ounce of this to four ounces of plain collodion.
Iodide of calcium	10 "	
Iodide of ammonium	15 "	
Bromide of ammonium	20 "	
Alcohol	3 ounces	

That is to say, he uses one-third bromide and two-thirds iodide, or rather too much of the former. The proportions I recommend are safer for general work, though of course the changes can be rung upon them *ad libitum.* But the merit of his iodiser is that it contains cadmium and calcium, and without these salts I believe no collodion can be deemed first-rate. R.

PERMANENT POSITIVES.

By M. Lafon de Carmasac.

In the early part of the year 1855, in a memoir presented to the Academy of Sciences, at its meeting of June 11th, I described certain processes by which I produce photographic pictures with various materials.

The colouring materials selected at the will of the operator are actually substituted for the photogenic agent, and fixed upon glass, porcelain, enamel, metals, ivory, paper, wood, &c. Some proofs, formed of the oxides of copper, iron, manganese, cobalt, gold, and silver, fixed on glass and enamel by fusion or by the muffle, offer the best guarantee of permanence, with great splendour and variety of colour. Having for many years sought the solution of the problem of fixing the photographic image, I investigated at this period its most difficult and most conclusive phases, and at once succeeded in producing images incrusted by fire in ceremaic materials, the permanence of which is indefinite. Although many interesting applications presented themselves to me at this time, I devoted all my efforts to improving the character of the optical image, to the simplification of the manipulations, and to the solution of the problem of curved and accidental surfaces of the supporting substances, to numerous experiments upon colouring materials, with reference to their durability, and the mode of fixing. These improvements ought to precede every attempt to apply them to the arts and manufactures.

Substances which support the picture: Colouring agents—Porcelain, enamel, earthenware. The picture is formed of metallic oxides, and fixed in the muffle.

Chinaware, biscuit, hard enamel, glass, crystal. Fluxes are added to the metallic oxides, and fixed in the muffle.

If the biscuit is to receive a glaze, cobalt is used, and fixed in the furnace.

Upon various white or deeply tinted materials I also form the image in gold or silver with their fluxes, and fix in the muffle. The metal may be kept *mat* or burnished.

Silver — The image is produced in gold, or in a combination of silver and lead employed in niello, and fixed in the furnace.

On paper, parchment, gelatine, ivory, wood, prepared linen, &c., the image is formed with various colouring materials, and fixed with gum, albumen, glues, oil, varnish, or encaustic.

On the various deeply-coloured materials, the image is also made in silver, gold, and bronze.

Colouring with vitrifiable pigments commands the whole palette of enamel painting. Colouring on papers may be varied to infinity. In either case, with reference to finish and homogeneous aspect, there is no objection to forming the image with mixed colouring materials, having regard, of course, to the laws which govern their combination in fusion.

All the pictures I have described can be produced by the pencil. They can also, within certain limits, be obtained *photographically* with the various colours, which is of importance in the final colouring of the proofs; for the artist will not have to contend with the monotony of the ground-colour, but finds to hand a sketch coloured in harmony with the result he desires to attain. He will therefore be able to obtain brilliancy and richness of tone, without compromising the integrity of the picture obtained by the action of light, by employing opaque pigments. Whatever be the substance upon which we desire to obtain a picture, we can always produce this image with permanent materials. We can avail ourselves of the effects of frosted and burnished silver and gold, and colours, according to the result desired. These results are obtained upon objects of every shape. The photographic problem would, therefore, appear to be completely solved.

By vitrifiable materials or associations of metals, by furnishing a beautiful ornamentation to the vitreous and ceremaic arts, and to the goldsmith and jeweller, and many other arts.

By ivory, wood, prepared linen, &c., by substituting beautiful designs for the crude pictures so generally employed in the arts which employ costly woods, ivory, shell, &c., and minister to the daily wants of life.

By paper, with the image in carbon or any other unchangeable material, in permitting museums to be enriched with precious materials, and rendering collections of all kinds possible; galleries of portraits, representations of remarkable events, important historical documents, rare book illustrations, the diffusion of everything graphic that can interest the public—analogous to printing and engraving.

By the combination of all these means, in greatly extending the artist's field of operations, by creating the photographic product. In colours there are effects of all kinds to appropriate, he can combine general ornamentation with form, &c. Besides the permanent materials he makes use of, permit him to make a valuable work; the operator need no longer draw back from artistic studies which aim at the beautiful, since this beauty he will be able to appreciate in a durable manner.

These suggestive processes, described in 1855, appear to me to have suggested carbon printing and other novel processes. They have received, since that date, various improvements in my hands. The principle, however, remains the same, and will, I think, remain unchanged.

The images I have produced are so perfect that I can multiply a negative upon glass or waxed-paper, with all the vigour and finish of the originals.—*Cosmos.*

PHILOSOPHY OF POSITIVE PRINTING.

MM. Davanne and Girard, in continuing their researches upon "fixing," have noted some facts which they announce briefly in anticipation of their report, and to which we made allusion in a former number. The following is condensed from *Le Bulletin*, &c.—

Every photographer must have observed a curious phenomenon

that exhibits itself when positive proofs are immersed in the fixing solution upon being taken out of the printing frames. The proof quickly loses its violet hue and acquires a red colour, which varies under different circumstances, but which is constantly produced. Hitherto this phenomenon has been explained by saying that the sub-chloride of silver in the proof is decomposed; but as the theory of the sub-chloride is rejected by MM. Davanne and Girard, they see the necessity for assigning the phenomenon to some other cause.

Remembering that in the course of their researches they had constantly seen this red colour arise from a combination between the reduced nitrate of silver and the "sizing," they thought that the explanation of the phenomenon was to be looked for there. Reflecting also upon the nature of the fixing agents employed—ammonia, hyposulphite of soda, cyanide, &c., they remarked that all these substances have an alkaline reaction. Now it is well known that the alkalies have the property of making the substances employed as sizing *swell-up*, that is, of bringing them to a sort of imperfect solution; and this is especially the case with starch. Therefore it appeared quite rational to suppose that at the moment of immersing the proof in the fixing solution, the latter exercises its alkaline re-action upon the "sizing," causing it to swell, that is, making it begin to dissolve, and consequently render it apt to combine with the reduced nitrate of silver, which it could not do previously, because these substances were all in the solid state.

If this hypothesis be correct it is easy to verify it. In the steam of boiling water we have an agent which, incapable of effecting chemical decomposition upon the salts present, can yet exercise the same "swelling" action as an alkali. When, upon taking it from the printing frame, we expose a proof on paper sized with starch to the vapour of boiling water, it immediately assumes the familiar red hue which it acquires in a solution of hyposulphite of soda; but plunged in cold water, the same proof undergoes no evident change, for cold water does not cause starch to swell much.

Experience has confirmed the truth of these facts. A proof upon paper sized with starch, immersed in cold water undergoes no change in hue, but it immediately becomes red when immersed in boiling water or exposed to its steam.

The question arises—is this the sole cause of the change, or is the phenomenon complicated with accessory phenomena? This will be investigated and established by the authors in their forthcoming memoir. At present they content themselves with making known the preceding facts, which appear to have some importance in connection with a theory of fixing.

They are satisfied that all the salts having an alkaline reaction, such as phosphate of soda, borax, &c., act in the same manner as ordinary fixing agents, although more slowly.

PROPOSED CONTRIVANCE FOR KEEPING WAXED OR PLAIN PAPER PICTURES LONGER THAN USUAL BEFORE DEVELOPMENT.

By C. J. Burnett.

The necessity of developing within a very short time after the picture has been taken, has been long a very general complaint against the paper processes. Mr. Young's plan of hypo-fixing before development would remedy this; but there is also a much simpler and less objectionable plan which promises to answer well enough, being simply the washing away of the free nitrate from the paper. This can be done either at once, or quite well in the evening, when we come home, and the papers will then keep for at all events some days before development. The presence of nitrate or allied salt during development is, however, necessary, and may be secured either by developing in a bath containing nitrate of silver, along with acidulated gallic acid or sulphate of iron, or else by immersing the papers, with the dormant picture in it, first in a nitrate of silver bath (containing, it may be, a little acid), and then in a solution of gallic acid (with or without acetic or citric acid), or in a solution of acidulated sulphate of iron.

To retain the oxide of silver in the print during development, and prevent its being dissolved out by the water in the gallic acid, or other development bath, any one of the three following plans may be resorted to:—

1. The mixture of phosphate of soda, or oxalate of potash, with the gallic acid bath; or of rochelle salt, or citrate of soda, with the iron bath, where it is used.

2. The dipping of the paper on which the latent picture is, first in one of these salts, and then in nitrate of silver, before immersing it in the developing bath; or

3. The reversing this so far, by making the nitrate of silver bath precede the bath of the phosphate, oxalate, or similar salt, concluding with the gallic or ferrous development bath as usual.

ON STRENGTHENING NEGATIVES.

By Dr. Henry Draper, New York.

Collodion negatives may be readily strengthened by the application of a solution of protochloride of palladium, which is easily prepared by dissolving small pieces of this metal in *aqua regia*, which acts upon it very promptly, and produces a solution the colour of which is a dark brown-red. It must be evaporated to dryness, taking care that the heat be not so high as to decompose the chloride, but yet sufficiently prolonged to disengage all the acid. The brown residue, which is protochloride of platinum, is soluble in water, and in this state is employed in photography.

If we take a collodion negative which has been fixed with cyanide of potassium or hyposulphite of soda, and still moist, and pour over it a given quantity of this solution, a change will be immediately apparent: the proof gradually becomes darker. In those portions which have most intensity a deep velvety black is obtained, impermeable to light. Whether the picture be negative or positive the effect is the same, although it will be less in the latter than in the former, and the intensity is equally the same both by reflection and transmission. In the application of the protochloride, if the solution be strong, the effect takes place almost immediately. A prolonged exposure is useless and produces no new result. The solution will serve again and again until exhausted. As it becomes weaker its action becomes slower, and the operator will take the precaution to examine the glass on both sides, to ascertain if the film is thoroughly penetrated. The most favourable time for applying the palladium is immediately after fixing; but it may be employed at any subsequent period, if the film be previously moistened with water, but the result is less satisfactory. There is no difficulty in employing the protochloride nor any fear that it will produce stains on the glass. As a proof of the advantages to be derived from the use of this agent, it may be stated that a collodioned plate, prepared in the usual manner, was exposed to the light of an Argand lamp at a distance of four inches; and a fourth of an inch uncovered at successive intervals of four minutes, two minutes, one minute, ten seconds, and five seconds; the effects thus produced on the collodion film by the light of the lamp were then developed in the usual manner, and the half of each strengthened by chloride of palladium, leaving the other half intact. Upon taking a print from this negative, it was observed that the part blackened by the chloride, which had been exposed five seconds to the light of the lamp, was as intense as the portion which had been exposed eighty seconds, but not strengthened with the chloride. It may therefore be concluded that the opacity of the negatives is augmented sixteen times by the employment of protochloride of palladium.

It also exercises a good effect upon the collodion film by rendering it more adherent, so that the image thus treated will be more resistent than others.

DEVONSHIRE CUSTOM.

The other day an old friend, to whom we had lent some stereographs, produced by Mr. Widger, of Torquay, himself a skilful photographer, and a native of Devonshire, favoured us with the following interesting piece of gossip:—

"The Photograph marked *Tor Abbey*, which is a portion of the old building that has been converted into a barn, brings to my recollection a custom which formerly prevailed in that neighbourhood, but which may now be considered obsolete, for I do not think that it has been practised for more than half a century.

"In my childhood many of the farmers used to give a supper to their work-people and servants on Twelfth Eve; and that it was an ancient custom may fairly be inferred from the fact that in some houses it was kept on *old* Twelfth Eve.

"The ostensible purpose of the gathering was to ensure a good bearing of apples the next autumn by *firing at the trees*.

"An account of the ceremony has been published; but as it differs in many respects from what was practised within my memory, I will describe it as an eye-witness.

"The supper was a plain but substantial one, and a cake was made having the same qualities—very unlike those that are exhibited by the London pastry-cooks on Twelfth Day. The drink, of course, was cider, finishing off with a large jug of "cider and——" that is to say, cider and brandy; the cider being heated with ginger and sugar, and a fair proportion (about one fourth) of brandy being added to it. This was by no means a bad drink on a cold winter's night on returning from the out-door ceremony.

"In the course of the evening, generally after supper, the party proceeded to the orchard, all the guns that could be procured being

loaded with powder for the occasion. There, in front of some favourite tree, the following address was spoken, or rather *shouted*, with the united force of all the assembled lungs:—

Here's to thee Old apple tree,
Beer and blow, Apples enow.
Hats full, caps full, bushell—bushell bags full,
And Tor Abbey great barn full.
Hurrah! Hurrah!

Bang!—bang!—the firing being the climax.

"This was repeated at different parts of the orchard; and the party then returned to the house quite prepared to do justice to the good cheer within.

"On one of these occasions my father happened to be from home, and his fowling-piece was taken by some one unaccustomed to shooting, who, loading in haste, forgot to withdraw the ramrod, which, of course, was shot away and never afterwards found.

"This, I believe, was the cause of the custom being discontinued in *our* house. I know that it was left off long before I was old enough to handle a gun; so that the only part I ever took in the proceeding was to add my feeble voice to the shout.

"That the ceremony was at one time really supposed to promote its ostensible object is highly probable, for we cannot otherwise account for its origin; and I have myself heard it remarked, when some usually prolific trees have failed to bear, 'we forgot to fire at them last Christmas.'"

It may be asked—"What has this to do with photography?" if so, it must surely be by the unimaginative being described by Wordsworth, when he says—

"A primrose by the river's brim
A yellow primrose was to him,
And it was *nothing more*."

What but a photograph, or the actual scene itself, could have roused from the treasures of memory so vivid an impression of scenes in which the actor took part more than half a century previously?

THE LATE FREDERICK SCOTT ARCHER.

It is doubtless known to most of our readers that the late Mr. Frederick Scott Archer, at his death, left a widow and young family unprovided for. Recognising the eminent services this gentleman had rendered to photography, it was thought that no better tribute could be paid to his memory than by raising a subscription for the benefit of his bereaved family, and protecting them from indigence. The effort was made, but the result was not so flattering to the liberality of the photographic profession as was hoped for.

Mr. Archer's widow followed him to the grave within a brief year after his decease, leaving three little children to the tender mercies of the world. Among the new pensioners on the Civil Service Pension List we find the names of Alice, Constance, and Janet Archer, as recipients of fifty pounds a year, held in trust by Nathaniel Maclean and Roger Fenton, Esqrs. This sum will save them from want, it is true, but alone it is a very small tribute to the services of one who has rendered such important aid to photography, and to whom every photographer is under the deepest obligation. We believe that Sir William J. Newton has been mainly instrumental in obtaining the grant, which is one that will be a very welcome addition to the Archer Fund, a fund still open for augmentation if any of our readers who have not yet contributed feel disposed to do so.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

Nitrate of Uranium.—The conflicting claims of M. Niepce de St. Victor and Mr. Burnett to the honour of having introduced this substance as a photographic agent.

The following official reply to some editorial remarks of our own, and to a letter of Mr. Burnett, recently inserted in these pages, has been sent to us for publication:—

Blackheath, July 27, 1859.

Dear Sir,—In your number for 1st June you make a remark on our annual report which we regret has remained so long unnoticed. The cause of the delay has been our wish, before writing, to get a sight of Mr. Burnett's paper, in order that full justice might be done him.

The catalogue you so kindly sent us we cannot look upon as a publication in the true sense of the term, as, though affording good evidence to all into whose hands it came, its circulation was entirely confined to the comparatively few who visited the Glasgow exhibition of photographs in 1855. Having been expressly referred to a paper read before the British Association in that year, we naturally first consulted their printed reports, where no such paper is to be found; nor, as far as we can discover, is it mentioned in any of the journals which gave reports of the Glasgow meeting.

It now appears from Mr. Burnett's letter in your last number, that his paper was never published till 1857 in *Photographic Notes*, so we had been searching for it some two years too early. Having read his paper, we reply to your remark in the first place, that we had no intention of crediting M. Niępce with being the introducer of uranium as a photographic agent, when we spoke of his uranium printing process as one of some promise, any more than if we spoke of the negative process of A. B. we should mean that A. B. was the first who ever made a negative. We simply referred to his particular method of using it, detailed in his paper in the *Comptes Rendus* for March, 1858. We were certainly not aware at the time of the close identity of his process with that of Mr. Burnett's, published in 1857, or we should not have failed to notice it. At the time our report was written M. Niępce's prints were being handed about at various scientific societies in London, and excited great attention, not only on account of their beauty, but also because of the great stability which he ascribed to them. When speaking of M. Niępce's experiments, we naturally noticed them, and none can regret more than ourselves that in so doing we should have even appeared to do wrong to Mr. Burnett. A simple reference to where his results were to be found would have caused us long 'ere this to have recognised his claims.

To Mr. Burnett's coarse accusation of giving a certificate to a monstrous and systematic plagiarism, we can only reply that, in all probability, M. Niępce is as guiltless of the plagiarism as we are of endorsing it. Nothing is more common than for two men experimenting on the same subjects to arrive at similar results; and the extremely limited circulation of English periodicals on the Continent renders it very improbable that, at the time his paper was read, M. Niępce had even heard of Mr. Burnett's experiments.

Mr. Burnett will not find that the use of intemperate language will at all advance his claims to be considered an inventor.

JAMES GLAISHER, President,
On behalf of the Council of the Blackheath Photographic Society.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. III.

IN THE VALLEY OF JEHOSHOPHAT.

This morning my eyes are gladdened and my heart is cheered by the sight of a bundle of letters and papers from home. Truly, manna in the wilderness, and I bless the good Samaritan who so promptly despatched a fleet messenger from Cairo, to track my wandering footsteps to the shores of Askelon, who halted and rested not until he placed the precious burden at my feet. To day I will hold jubilee. I will recline under my tent and read my letters, and con over the columns of The Photographic Journal, some half-dozen numbers of which form not the least interesting item in my packet.

"Ho! Hassan! Prince of the Faithless!
"Hassan is the slave of the Howajji.
"Bring Coffee!"

Tradition relates that Ramleh is the ancient Ramah. It stands on the borders of the great plain of Sharon. To the east are the mountains that separate it from Jerusalem, to the westward lies the sea. You may perceive the blue Mediterranean from the summit of the tower. We halted for the night at Ramleh, and in the early morning I took four views of the city and adjacent scenery. That done I struck across the plain to Ludd, a modern city on the site of the ancient Lydda, a distance of about four miles, while the sun was ascending from behind the hills of Ephraim.

The ruins of the ancient city are imposing, those of the vast church of St. George especially so. It was at this place that our national saint was born, and, for aught I remember to the contrary, it was here he fought and slew the dragon. The bishopric of St. George, at Lydda, was one of the most powerful sees in the Christian Church. It is celebrated in Scripture history as the scene of Peter's miracle of the healing of Eneas.

I had intended to proceed to Jerusalem from Ludd, but while seated meditating amid the ruins of the old church, I suddenly bethought me that I should miss seeing Jaffa, the Joppa of Scripture, and unless I now made a deviation from the route of some twelve or fifteen miles to go down to the coast, I might in all probability not see it at all. We had no inflexible route marked out, but desired to visit every place of interest, in connection with the main object of our journey. As for me, I cared nothing where I might lay my head on the morrow. Wherever it might be, I knew I should be sure to find material for the exercise of my photographic abilities.

The baggage mules were in the rear. We had but to leave an order for them to alter their course, and then start at a gallop

across the lower end of the plain of Sharon, when in about a couple of hours we reached the most luxurious groves of oranges and prickly pear, from among which we emerged suddenly at the gateway by which you enter the city of Joppa.

The aspect of Joppa is stately and commanding: the city stands upon a hill, or knoll, which forms a promontory on the sea coast. It is surrounded by a strong, gray, venerable-looking wall, which dates from the times of the Saracens. When you enter the gateway on the land-side you step at once into a crowded bazaar, and and then you find yourself in the filthiest of seaport towns, crowded with Arabs and fleas.

I took a stroll through the streets of the city, seeking what I might find, and devouring, as I walked, some splendid Jaffa oranges. Many groups and picturesque subjects for photographs presented themselves, which I would gladly have transferred to my portfolio, but I knew the attempt would be hopeless. Had I planted my camera in the streets of Joppa I should have been devoured by human flies. Outside the city I find more elbow-room: with our mules and horses I form a hollow square, within which I plant my camera in peace, without fear of being pounced upon by marauding or suspicious Bedouins.

The views I took of this picturesque city are among the most interesting I have yet obtained, perhaps even the most so. Joppa was a city of the Philistines, celebrated chiefly in ancient times as the port of Jerusalem, to which Solomon brought his timber from Tyre. Jonah sailed from this port when seeking to escape the duty assigned him; and it is not far hence that they show the identical place where the whale threw him out on the sand. At a subsequent date Joppa became a point of interest in Christian history. It was here that Peter performed the miracle of raising Dorcas to life; and here, also, he saw from the house top of Simon the tanner the sublime vision which declared that all distinctions between Jew and Gentile were for ever swept away.

They point out, in the heart of the city, the house of Simon, a little square stone building, with an open roof, looking out upon the sea:—the veritable house of the tanner, believe it who will. Half-naked Arab children lay on the sunny pavements of the court, both common and unclean in appearance, and an atmosphere of filth enveloping everything around. The streets were ancle deep with mud. Everything was melancholy, as everything always is in an Eastern city. I panted for the free air, and slowly and dejectedly walked out to the fresh shady spot where our tents were pitched.

The East is the Paradise of those who desire to indulge their self-importance. With what an air of grandeur you can order breakfast when you have an obsequious slave to wait upon you! It is impossible, amid the grandeur that surrounds you, with the hot red sun shedding his glory on the scene, to say, in homely phrase, "Bring breakfast." You feel that you must indulge in Oriental magniloquence and pompous phrase; therefore do I say, "Ho! Hassan, prince of the faithless, bring coffee!"

I thought this morning I would pay minute attention to Hassan while he busied himself in preparing the infusion of the fragrant berry. The operation of roasting the berries I did not see performed. My observations commenced with the grinding or pounding between two stones, one slightly hollowed for the purpose. The coffee-pot was of silver, with a tightly fitting cover, within which a ring fitted, to which a flannel bag containing the pounded coffee was suspended. Pouring boiling water upon this, it quickly filtered through, as clear as wine, and was immediately transferred hot and fragrant to the little cups on the board. I essayed to discover the philosophy that guided Hassan in his operations, and think it may be summed up in two words—*quick* and *hot*. He never made me more than one cupful at a time, for this reason, that the second would spoil while I was sipping the first; for here, coffee is not drank but sipped. If you wish to obtain the exhilarating, restorative effect of coffee, you must take it without milk; with this addition, however, it is more nutritive by virtue of the milk added, but less exhilarating. Happy Orientals, to whom chicory is unknown! When that foe to the fragrant berry insinuates its insidious presence on the desert, may the days of the adulterators be numbered! I heartily applaud the manner in which those who tamper with the purity of the necessaries of life are treated in these regions. And I must confess I should rejoice to see a fraudulent grocer nailed by the ears to his own doorpost in Whitechapel, a terror to all evil-doers.

"Woe unto the inhabitants of the sea-coast, the nation of the Cherethites! the word of the Lord is against you: O Canaan, the land of the Philistines, I will even destroy thee, that there shall be no inhabitant!"

All the terrible denunciations of Scripture rushed into my memory as I walked through the narrow, vile, and filthy lanes of the cities of the Philistines. With every facility for a prosperous commerce, the trade is limited to dealings with the Egyptian and Damascus caravans. Some shops for the peddling of smallwares alone represent the commercial importance of a city once a proud mart of Mediterranean commerce. I cannot impart to you the emotion and enthusiasm I experience as I tread this sacred soil: its rocks, trees, and flowers remain, but the men who dwelt among them have given up the ghost, and where are they? D. T.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER IV.

MAXIMS, &c.*

FAILURES more frequently arise from the want of a proper foundation than any other cause. Let not the student of these chapters therefore consider such preparatory pages tedious. There is no royal road to art, and impatience is not favourable to progress, as witness the old adage, "The more haste the less speed," and another famous saying, about "Slow but sure." It is a true sign of quackery when the difficulties of any art or science are overlooked or ignored, and quackery is but the voice of ignorance. Speaking from my own experience, I say emphatically that *the thoughtful head best aids the industrious hand.* In the earlier stages of my progress I trusted to the latter almost entirely, and was reduced very frequently to despair; but when I combined the two, then real progress was made, and I have been sanguine and progressive ever since, earnestly hoping to remain so to the end, for "art is long and life is short," and the goal of perfection has not yet been reached in any branch of this world's knowledge. The true artist is always a student, and he who has acquired most is ever the most conscious of his deficiences. The great Titian, when he had studied and painted until he was seventy years of age, *then* only *began* the best part of his career; but on his deathbed, far, far away, there still loomed before his outstretching love the goal he had been so long nearing, still misty and faint in the extreme distance as it had ever been, and ever would remain! When you think of this, can you hope to master, at once, one of the most important branches of an art which baffled for years the powers of the mightiest of its great masters?

I shall now proceed to arrange a set of maxims founded upon the experience of some of our most successful painters.

The following maxims, given under the proper headings, will illustrate the principles and practice of colouring, and form one of the best introductions to brushes and colours that I could select. I might have embodied most of the ideas in my own words; but by so doing, I should have deprived these maxims of the weight they derive from the great names attached to nearly all of them as quotations. Each maxim is numbered, in order that we may easily refer to any hereafter, to illustrate and explain more mechanical directions.

GENERAL MAXIMS.

1. "Outline and chiaroscuro may make a finished drawing, but it is an imperfect substitute for the totality of painting, which comprehends the whole natural appearance."—*Barry.*

2. "Scientific rules are the only sure and easy, though deliberate, conductors of true genius."—*C. Hayter.*

3. "GENIUS, with the *utmost aid of scientific theory,* must submit to *practical application,* as rudimentally necessary to accomplishment in the practical and mechanical department of *painting.*"—*Ibid.*

4. "Genius cannot supply the want of competent knowledge."—*Ibid.*

5. "Art, by practice, to perfection soars."—*Fresnoy.*

6. "Acquire a certainty of hand by deliberate attention to the natural but most characteristic properties of each *individual* object: this will prevent that sort of conclusion which is the parent of 'MANNER.'"—*C. Hayter.*

7. "Take care to use your materials so that the picture may not look *painty.*"—*Ibid.* "There is a degree of impiety in pleading a want of faculties, when the real want is proper industry and method to make right use of them."—*Ibid.*

MAXIMS FOR COLOURING GENERALLY.

8. "Inasmuch as a gamut is not any distinct tune of itself, so a chromatic display of the formation of colours is not any distinguish-

* In making use of some of the best maxims of artists who have written books, I must solicit the indulgence of their authors or publishers, and trust, that in giving my pupils such extracts I best serve the purpose these works were written to aid, viz., the advancement of "*true art.*"

able picture; yet so perfectly do each develope that systematical order by which nature has determined harmony, that, without them, painting with regard to colours, as well as music with regard to sounds, would remain to all, as they still do to all those who are unacquainted with them."—*Ibid.*

9. "The predominant colours of the picture ought to be of a warm, mellow kind, red or yellow; and no more cold colour should be introduced than will be just enough to serve as a ground, or foil, to set off and give value to the mellow colours, and should never of itself be principal."—*Sir J. Reynolds.*

10. "The fewer the colours the cleaner will be their effect."—*Ibid.*

11. "*Two* colours mixed together will not preserve the brightness of either of them *single*, nor will *three* be as bright as *two*; of this observation, simple as it is, an artist who wishes to colour bright will know the value."—*Ibid.*

12. "I am confident that an habitual examination of the works of those painters who have excelled in harmony will, by degrees, give a correctness of eye that will revolt at discordant colours, as a musician's ear revolts at discordant sounds."—*Ibid.*

13. "Every hue throughout your work is altered by every touch that you add in other places, so that what was warm a minute ago becomes cold (by contrast) when you have put a hotter in another place, and what was in harmony when you left it becomes discordant as you set other colours beside it; so that every touch must be laid, not with a view to its effect at the time, but with a view to its effect in futurity."—*Ruskin.*

14. "Fine colouring consists of truth, harmony, and transparency of tints."—*Opie.*

15. "The true colourist first considers the nature of his subject, if grave, gay, magnificent, or melancholy, heroic or common."*—*Ibid.*

16. "Colour must be employed to harmonise, vigorate, soften, and aid chiaroscuro, giving breadth and unity to the masses of brightness or obscurity, and in distinguishing by their depth, strength, or brilliancy, the principal or subordinate figures."—*Ibid.*

17. "Good colourists break up the appearance of predominating masses of colour by a repetition of similar tints."—*Ibid.*

18. "Transparency is not flimsiness, brilliancy not rawness."—*Ibid.*

19. "Flesh is not roses, nor vulgarity vigour; character and truth are lost in the hues of flattery."—*Fuseli.*

20. "Colours, as in a prism, should emerge from and flow into each other."—*Ibid.*

21. "If the principal colours in a picture consist of green, blue, or red, all the other parts ought to possess small portions of the same to unite the whole."—*Gerard de Lairesse.*

22. "The hand that colours well must colour bright,
Hope not that praise to gain by sickly white."—*Fresnoy.*

23. "Reflecting surfaces tincture the objects reflected on with their colour, proportionately with their distance from each other, the angle under which the light operates, and the textures of both surfaces."—*C. Hayter.*

24. "The general prevailing colour of light tinctures every object within its influence: for instance, observe the whole hemisphere at clear mid-day, or the time of a warm sun-setting, or the grey effects of a cloudy sky, or a fog."—*Ibid.* [This rule should be remembered when painting any peculiar effect of light on the figure or background. It is no uncommon thing to observe the gloom of a storm in the background when the figure is as brilliantly lighted as if in the full blaze of a summer sun; or the hues of *sunset* about the horizon, behind a figure lighted by rays from the sun at noon, &c.

25. "When a white surface *reflects* on the *shadowy* part of any colour, it looks *paler* than the *lighted* parts of such colour; but the power of the shadow holds it inferior with regard to light."—*Ibid.*

26. Glossy surfaces reflect the colour of the air or surrounding surfaces; and, for this reason, what is called the true "local colour," is not seen upon such surfaces where they receive the light, but rather in the half-tones; objects less polished or smooth best exhibit local colours.

27. "Every colour that is reflected on by its own colour is enriched thereby, according to the strength of the reflected light." —*C. Hayter.*

28. "Every colour that is reflected on by its directly opposite colour will be neutralised thereby; such as *green* against *red*, *blue* against *orange*, or *purple* against *yellow*, in an equivalent degree with the power of light."—*Ibid.*

29. "If any two approximate colours reflect the one on the other, its tincture will approach the appearance of that compound which the two other colours would make by mixing them."—*Ibid.*

* How often do the accessories quarrel with the principal object! Jones, a journeyman tailor, looking a journeyman tailor, with the background of a palace, provokes sarcasm and ridicule; but the same subject, with a quietly characterised background, &c., is quite another thing.

30. *The deepest shadows are not quite black;* for although the presence of shade indicates in its degree the absence of light, and consequently of colour, still it is very seldom indeed that they are not redeemed from positive blackness by the presence of reflected light.

31. *The mere imitation of colours is not sufficient to produce really natural effects*, because, as our highest or most brilliant light, white paint, falls far short of the brightness of white light, so our *black* is as far removed from the intensity of nature's darkest shadows: hence it is that certain painters guilty of "*exaggerated colouring*" have yet conveyed to every spectator an impression of *truthfulness*; and others who have laboured to reproduce *with their poor scale of coloured pigments* the very tones, tints, and shades of their model, have failed to satisfy either themselves or their patrons. Howard says—"As it is impossible with pigments to rival the brightness of light, it is found necessary to adopt some method of forcing the effect of colours, so as to conceal or supply a compensation for this deficiency, and *apparently* to produce the vigour of truth."

32. "Let no one think the force of colouring consists in the choice of beautiful colours alone, as fine whites, beautiful azures, green, or the like, for these are equally beautiful before they are made use of; but in knowing how to manage them properly."—*Ludovico Dolce.*

33. "We are to consider in what part any colour will show itself in its most perfect purity; * * * different colours differ materially in this respect. Black is the most beautiful in its shades; white in its strongest light; blue and green in the half-tint; yellow and red in the principal light; gold in the reflexes; and lake in the half-tint."—*Leonardo da Vinci.*

34. "When you want to know if your picture be like the object you mean to represent, have a flat looking-glass, and place it so as to reflect the object you have imitated, and compare the original with the copy."—*Ibid.*

35. "One painter ought not to imitate the manner of any other; because in that case he cannot be called the child of nature, but the grandchild."—*Ibid.*

"Whoever flatters himself that he can retain in his memory all the effects of nature, is deceived, for our memory is not so capacious; therefore *consult nature for everything.*"*—*Ibid.*

36. "When the work is equal to the knowledge and judgment of the painter, it is a *bad sign;* and when it surpasses the judgment, it is still worse—as is the case with those who wonder at having succeeded so well. But when the judgment surpasses the work it is a *perfectly good sign.*"—*Ibid.*

37. "The edges, extremities, or boundaries of *all* shadows are *grey.*"—*Howard.*

38. "From the effect of contrast, shadows appear *comparatively* of the opposite colour to that of the light."†—*Ibid.*

MAXIMS FOR COLOURING FLESH, &c.

39. "The painter must always keep an attentive eye upon the *tints* and *softness* of flesh; for there are many who paint it so that it appears like porphyry, both in colour and hardness. * * * For my part, I would prefer browness to an improper white; and would, for the most part, banish from my pictures the vermilion cheeks and lips of coral, which make the faces look more like *masks* than *nature.*"—*Ludovico Dolce.*

40. "Paint your lights *white*, place next to it *yellow*, then *red*, using *dark red* as it passes into the shadow; then with a brush, dipped in cool grey, pass gently over the whole, till they are tempered and sweetened to the tone you wish."‡—*Rubens.*

41. "All the retiring parts of flesh partake more or less of grey." —*Mrs. Merrifield.*

42. "Strong shadows should be warm, those of flesh (which is semi-transparent) always incline to red."—*Ibid.*

43. "All the shadows of flesh must have grey edges. This prevents hardness and gives great richness."—*Ibid.*

44. "The reflected lights of flesh are warmer than the surrounding parts."—*Ibid.*

"The darkest parts of shadows are near their edge, the middle being lighted by reflected lights."—*Ibid.*

45. "The divisions or roots of the hair being shown prevents the appearance of a wig."—*F. Howard.*

The vivid spark of light in the eye falls upon the most prominent part, and diagonally opposite it will be found a reflected

* I have introduced this maxim, and some others, to tell against a practice commonly prevalent among photographic colourists, viz., that of painting from memory, aided only by a few brief written notes, rather than from the sitter.

† "Comparatively," because liable to certain modification from the effects of atmosphere, reflected colours, &c.

‡ These directions are intended for oil. The principle is *very good;* but in the works of this great master we find these colours placed side by side with so little attempt to blend them, that the effect is coarse and unnatural. The "cool grey" is of course not intended as a glaze to be carried at once over the whole of the flesh.

light, stronger or fainter, according to the prominency of the eye and position of the spark, which is, in the photograph, universally exaggerated. The eye's transparency and life-like expression will be obtained by carefully strengthening and studying the position of the spark and reflected light.

Remember that in nature there are *no outlines*, and that the less like lines your's appear the truer will they be to your model; but do not run into the opposite extreme, or what is usually termed "woolliness."

46. Carefully avoid a kind of flesh painting, sometimes much admired for its touchy, sparkling effect, which destroys truth of texture, and makes everything appear to be formed of polished stone or metal.

47. Remember that flesh is not as brilliant in colour as flowers and fruit, nor as transparent as pearls, and that the imitation of such things is not painting *flesh*, which has distinctive character and beauty of its own, no less difficult to represent, or less pleasing to every eye when successfully displayed.*

48. "Avoid *the chalk*, the *charcoal*, and the *brickdust*." — *Sir J. Reynolds.*

49. Indistinctness is not softness.

MAXIMS FOR BACKGROUNDS.

50. "If the backgrounds of your pictures necessarily consist of distant objects, they should, I think, be indistinct, and slightly executed." — *W. M. Craig.*

51. The liberty taken with the "*horizontal line*" of perspective in the backgrounds of portraits is great and common; as this indicates the level of the spectator's eye, you should carefully place it upon that height in the picture which was represented by the eye of the camera in taking the portrait, and thus aid the general effect of truthfulness.

52. The figure should always stand prominently before the background, which should, consequently, be unobtrusive and retiring, with but few details and no pure colours; dark backgrounds give the more forcible effect, but they should not contrast the lights too harshly.

53. "Bright colours may be lowered to any tone required, but *dirty* colours can never be made to look bright."—*Mrs. Merrifield.*

* *Flattered Portraits* (if required as portraits) are a great mistake, they are never satisfactory, and for this reason, they are required to be made *unlike* by flattery and at the same time to be as *faithful resemblances* as if they were *not* flattered; most artists have experienced this vexatious fact. Resemblance under *favourable circumstances* is another thing.

Letters to a Young Photographer.

No. XVI.

MY DEAR EUSEBIUS,

You are now about to enter upon ticklish and debateable ground. The rival claims of albumen and collodio-albumen have to be settled by preference or experience: preserved collodion and dry collodion have many rival partisans, who respectively exaggerate the merits of the subject of their preference. I shall proceed to describe the process introduced by M. Taupenot, which is usually spoken of as a dry collodion process.

By an ingenious combination of albumen and collodion, a preparation is obtained which possesses the properties of both these bodies; combining the rapidity of collodion with the fineness of albumen, with so complete a dessication of the sensitive coating that it is scratched by the nail with difficulty. With these qualities there is the sensitiveness of the film retained for many months after immersion in the nitrate bath — a quality that cannot be too highly prized by the travelling photographer.

The cleaning of the glass is of primary importance in this process, as complete success in manipulation is mainly dependent upon a perfectly clean plate. Much of the discredit thrown upon the process is due to the failures which arose from blisters, &c., caused by the plates being imperfectly cleaned. It is amusing to read of the numerous remedies proposed for this inconvenience: they all resolve themselves into one — good cleaning.

It must be admitted, however, that greasiness is the principal cause of blisters; therefore it is advisable to clean the plates first in a strong alkali, in order to remove every trace of grease. Dissolve one ounce of American potash in a pint of water, and immerse the plates in it for several hours. The solution will answer for several lots of plates. Upon taking them out rinse them in a vessel of clean water, and then rub them over with whiting, contained in a linen or muslin bag, and let them dry. They can be kept in this condition for any length of time, and polished when required for use with cotton wool. If the plates have been used before, the film must be scraped off with a knife, and if they are very foul, it may be expedient to clean them with tripoli powder and nitric acid, and afterwards proceed as indicated above, taking care to remove all the dust that accumulates on the edges of the glass.

When you proceed to apply the collodion to the glass plate, go over the surface with a soft brush kept for the purpose, to remove any particles of dust or flue that may adhere to it, and breathe upon the plate to see if its surface is in a state of purity. It is necessary that the collodion be very adherent to the glass; an alcoholic collodion is not adapted for this process. It should be iodised with iodide of ammonium or potassium, but not with cadmium. Here is a formula for the collodion, which has yielded uniformly good results:—

Gun-cotton	1	drachm.
Ether	12	ounces.
Alcohol	3	"
Iodide of ammonium	1	drachm.
Bromide of ammonium	15	grains.

This collodion being very fluid, and containing much ether, evaporates very quickly, and it must be applied to the glass plate with some dexterity, in order to insure a uniform layer. Pour the collodion on to the middle of the plate—it will quickly extend to the edges. Have ready a stoppered bottle, into which place a clean glass funnel, with a piece of cotton wool loosely inserted in the neck of it. Into this you will drain the superfluous collodion from the glass plate, which will serve for use again upon the addition of a little ether, to make up for loss by evaporation.

The nitrate of silver bath is prepared as usual, of a strength of thirty to thirty-five grains to the ounce of water, and saturated with iodide of silver. If it prove alkaline to test paper, add a drop of acetic acid.

The collodionised plate immersed in this bath is allowed to remain five minutes, then taken out and drained; it is then carefully immersed in a dish of distilled water, and gently moved about in it; passed into a second dish of distilled water, and then washed under a stream of filtered water, finishing with two or three rinsings of distilled water. It is next placed at an angle on a piece of blotting paper to drain. It is then ready for the application of the albumen.

At this stage of the process I may stop to remark that it has subsequently been found an improvement not to wash off the silver solution entirely, but to dilute it by applying a *limited* quantity of water for that purpose. Full particulars of this improvement you will find in this Journal under the head of *The Fothergill Process.* You prepare the albumen for the next coating as follows:— Beat the whites of a given number of eggs into a froth; when strained take

Albumen	4	ounces.
Distilled water	5	drachms.
Iodide of ammonium	16	grains.
Bromide of ammonium	5	grains.
Aqua ammoniæ	2	drachms.
Loaf sugar	50	grains.

You may substitute salts of potassium for those of ammonium if you prefer to do so. In that case you must add to the solution of iodide of potassium a few crystals of iodine, which will prevent the formation of an infinite number of small spots in the film, which are so very annoying to the operator when they do occur.

The salts and sugar are dissolved in the water, the aqua ammoniæ then added, and when all are dissolved the whole is added to the albumen, well shaken up together, and then allowed to subside for four and twenty hours; then draw off the clear liquid by means of a syphon. So long as the odour of ammonia is perceptible, the mixture will keep in good condition.

Experts in photographic cookery have boasted of the superior attractions of fermented albumen and honey. If there are any advantages in this preparation, I have failed to discover them.

Coating the plate with albumen is a piece of manipulation that requires much tact to perform successfully. I do not think I can impart the requisite instructions in a letter, I will, however, give you a general notion of what is required, and leave the rest to your sagacity.

Take the collodionised plate and hold it by an angle opposite to that by which it was held when collodionised, pour the albumen upon the right upper corner, and let it flow to the left, and then by slightly inclining the plate let it flow in an even layer to the lower angles, allowing a little of the surplus, which will carry with it a few drops of water, to drain off — then incline the plate in the opposite direction so that the albumen flows in a uniform layer to the upper

edge of the plate; then by elevating the lower end cause the albumen to flow towards the hand, and allow the excess to flow off into a clean bottle, which when filtered will serve again. It must not be mixed with the original albumen.

When the excess of albumen has drained off, place it on an angle on blotting paper and allow it to become dry. In this state the plate is not sensitive, the iodides in the albumen destroying the sensibility which the collodion had acquired in the nitrate of silver bath. The plates may be kept indefinitely in good condition.

In description, the details make this process appear very long and tedious, but you will not find it so in practice. The plates, when dry, must be preserved in a well closed box, sheltered from dust and humidity.

When you require to make use of the prepared plates they must be sensitised anew. You may employ the same silver bath as before, or you may make another for the purpose, by taking

Distilled water	25 ounces.
Nitrate of silver	2 ounces.
Acetic acid	2 ounces.

The plate must be immersed in this bath with much care, and without hesitation, to avoid markings.

Upon removal from the bath the plate is allowed to drip for half a minute, then rinsed in two successive dishes of filtered water, then drained. Let a gentle stream of water from a washing bottle wash the surface of the albumen with two clear washings of water, then set the plate on an angle to dry in the dark.

When well prepared these plates are much more sensitive than ordinary albumen, but less sensitive than wet collodion. With a portrait lens, on a fair clear day, a picture may be obtained in two or three seconds. With a landscape lens, one, two, or three minutes will be required, according to light, diaphragms, &c. The plates will retain their sensitiveness several months, but they eventually lose a portion of it.

The plate is developed with the following solution:—

Water	5 ounces.
Gallic acid	7 grains.
Pyrogallic acid	2 grains.
Alcohol	5 drachms.
Acetic acid	1 drachm.

Add a few drops of the silver solution to the measure containing the requisite quantity of this for developing a plate. The formula may be varied according to circumstances.

A larger proportion of pyrogallic acid will yield more intensity in the blacks. If the plate be over-exposed, the gallic acid must be diminished, and the acetic acid increased.

Developing is most successfully performed by immersing the plate in the solution contained in a horizontal bath. I think that developing is the most difficult part of the process, and you must expect many failures before you succeed.

The fixing is performed with hyposulphite of soda. If the picture be strong, the solution may contain 10 per cent. of hypo.

Photographic Glossary.

Pins—As pins are very extensively employed in photography it is worth mentioning that preference should always be given to black pins, which, being protected by a varnish, are not readily acted upon by the various chemical agents with which they are placed in contact.

Pipe Clay—A well-known substance employed in photography to clear solutions of silver which have become discoloured by various organic bodies, such as albumen, gelatine, honey, &c.

Platinum—A dense white metal, very malleable, ductile, and infusible. It is the heaviest substance known. It is, like gold, insoluble in ordinary acids, but soluble in *aqua regia.* Platinum forms two compounds with oxygen and chlorine.

Positive—A positive photograph is one in which the position and light and shade of an object are reproduced in an image under the same aspect as they present in nature, and not reversed as in *negatives.* Positives are direct and transmitted; the first are produced upon glass, the second upon paper.

Positive Printing—The production of pictures upon paper from negatives on glass. One of the most delicate, difficult, and important branches of the art of photography.

Potassa: Potash—An oxide of the metal potassium, a very important substance, and of great practical utility. It is a fusible, volatile, white substance, which evolves great heat when moistened with water; forming the hydrate or caustic potassa, which is a white solid substance, very deliquescent, and soluble in water and in alcohol. It possesses alkaline properties in a very high degree, and completely neutralises the most powerful acids.

Proof Spirit—Alcohol or spirits of wine which contains forty-nine-and-a-quarter per cent of real alcohol, and is of the specific gravity of 0·9198, at 60°, is termed *proof spirit.*

Pyrogallic Acid—When gallic acid is exposed to a heat of 420° Farhenheit, or thereabouts, it is resolved into carbonic acid, and a new acid which sublimes in brilliant white crystalline plates. To this product the name of pyrogallic acid is given. It readily dissolves in water.

Pyroxyline: Gun Cotton—When carded cotton is plunged for twelve or fifteen minutes in monohydrated nitric acid, it remains unaltered in appearance, but a certain quantity of the acid becomes fixed. It is then freely washed in water, and carefully dried in the atmosphere; although unchanged in appearance, it is found to be greatly altered in its properties: it has become a highly explosive substance, like gunpowder. It is now insoluble in water, in alcohol, and in acetic acid, but soluble in ether mixed with alcohol, forming *collodion.*

Reduction—A chemical process by which a metal is separated from its combinations with oxygen and other bodies. Metallic ores are reduced to the metallic state by the agency of heat assisted by fluxes, and by other means. The blowpipe is a ready means of reducing specimens of minerals, salts, &c., to the metallic state.

Salts—Bodies formed by the union of acids with basic oxides—whether these latter be alkaline, earthy, or metallic. Salts are neutral, acid, or basic. They are grouped or arranged in two classes—In the first are placed those constituted after the type of common salt, which consists of a metal (*sodium*) and a salt-radicle, as chlorine. In the second stand those which, like sulphate of soda and nitrate of potassa, are supposed to be combinations of an acid with an oxide. The first are called *haloid* salts, the second *oxygen-acid,* or *oxy-salts.* There are compounds which contain sulphur in the place of oxygen, and these are also regarded as salts: they are termed *sulphur salts. Acid* salts are those in which one atom of a base is combined with two or more atoms of an acid, as in bitartrate of potash: *basic* salts are those in which the proportions of base are in excess of those of the acid. Salts often combine together and form *double salts,* in which the same acid is in combination with two different bases.

Saturation: Saturated Solution.—When a liquid has taken up as much of a solid body as it will dissolve, the liquid is said to be *saturated,* and forms what is called a *saturated solution.* Generally speaking, more of the solid body is dissolved when the liquid is at a high temperature than when it is low, but the excess of solid is deposited again as the liquid cools down. Sometimes when a liquid is saturated with one substance it will dissolve a notable quantity of another added to it.

New Books.

The Photographic Art: its Theory and Practice, including its Chemistry and Optics, &c., &c. Originally compiled by M. Sparling, revised and corrected to the present date by James Martin.
London: Houlston & Wright, Paternoster Row.

This is a title embracing a very wide field of operations, and though we have had this book for some weeks before us, it has been impossible to notice it fairly at an earlier date from the mass of matter that it was requisite to peruse. It is, as indicated above, chiefly a compilation by one hand re-arranged by another. The principal novelty in the present edition is a concise chapter upon the chemical part of photography—in fact so concise that the author has occasionally been led into making statements that are of rather too sweeping a character. For instance, we find, at page 17, "*Ammonia* is or ought to be *only* used photographically for the purpose of making ammonia-nitrate of silver." This is a proposition to which we can by no means assent; besides being much employed in composition, it is valuable also as a cleansing agent, and especially for use with albumen.

The treatment of residues will be found useful by many.

The optical part had better have been omitted, as it is neither altogether popular nor correctly scientific—the old error respecting the elliptical surface for avoiding spherical aberration is again repeated, oblivious of the fact that such a remedy does not apply to *oblique* rays, the very ones

that are the bugbears of opticians in general and photographic ones in particular. We also find the startling statement that to obtain *perfect* achromatism it would be necessary to have *seven* prisms. Query—Is it clear that it could even then be made *perfect*?

There is a useful diagram at page 41, showing what frequently puzzles those ignorant of optics, how it is that a lens covering fairly a given parallelogram, say nine by seven inches for instance, will not necessarily cover a *square* of nine inches.

We are glad to perceive Mr. Martin, from experience, strongly recommends the use of a crotchet (as it has been called) of our own, the construction of tripods of *fir*, the reason being that it is cheap, light in weight, and quite strong enough for the purpose.

We do not, however, agree with him in preferring patent plate glass to flatted crown, which he says will answer very well as a substitute; we should reverse these recommendations, heretical though they be, because the latter having a *natural surface*, whilst the former has a *wrought surface*, there is less liability to stains from want of perfect cleanliness, less difficulty in cleaning and less cost. For very large plates only we fear it is too thin.

We might go on making comments almost *ad infinitum*, but want of space will not permit us to continue farther. We fear that the novice in selecting this work as his *vade mecum* may be at little trouble with an *embarras de richesse*, but it certainly contains all he is likely to require, and is even a useful book of reference to the more practised photographer.

Foreign Correspondence.

Paris, August 10, 1859.

PHOTOGRAPHY will doubtless derive some benefit from the researches of M. Edmond Becquerel on *Phosphoresence.* That gentleman has just published his third *Memoirè* on "the various luminous effects resulting from the action of light on bodies"—the substance of which I will endeavour to communicate to you.

It will be remembered that these researches were undertaken with a view to determine the nature of the luminous properties which result from the action of light on bodies, by which the latter, in their turn, act as new luminous sources. A very large number of minerals and salts display luminous effects, while other substances, as the metals, exhibit none. Further light will doubtless be thrown on this fact by the researches of Dr. Otto Hagen, on the absorption of light by crystals. It must be observed that the emission of light in the phosphoroscope is limited by the sensibility of the retina, by the intensity of the active rays, and by a certain duration of persistence due to the impression received by the body. This duration can be represented by a determinate time only in what concerns the effects appreciable by the eye; for we may conceive, that according to the influence of the radiation the bodies continue to emit luminous rays, the intensity of which is too feeble to impress the retina. On the other hand, in supposing that the bodies are invisible in the phosphoroscope, we can not affirm that they have received any modification, for the light may have excited vibrations of a different velocity than that of the luminous rays, of which the length of the undulation will be greater than that of the active rays, which vibrations will be capable of giving rise to effects of heat or other molecular actions yet unknown. The following conclusions are deduced from these new researches:—

1. When a body is struck by light, by virtue of the action then imparted to it, the body may act as a luminous source, in emitting rays of various degrees of refrangibility, the duration of which is very variable (it may be less than one-fifth of a second, or exceed several hours), and the intensity of which is dependent upon that of the incident light, and always feebler than the latter. Every substance does not give appreciable effects: among those which possess this power in the highest degree are the different combinations of earthy and alkaline bases, and a certain number of metallic salts. Most other translucent and transparent substances, particularly those of organic origin, exhibit other feebler, though sensible effects. The metals and highly-coloured substances give rise to no effect.

2. The solid form of bodies is best adapted for showing these phenomena: still the effects observed in the ultra-violet rays with many fluids prove that the latter are endowed with actions of this kind, without being apparent in the phoroscope. On the other hand, when we employ a peculiar arrangement, with the aid of an apparatus of induction, the oxygen acquires the power of emitting light, which continues even after the passage of the electricity.

3. The luminous effect belongs to the mass of the body submitted to experiment, and is not merely a surface action: it takes place whatever be the incidents of the active ray, and is dependent only on its refrangibility and intensity.

4. The effect observed in the phosphoroscope after the action of the incident light exists, nevertheless, in a permanent manner during the influence of the latter. This conclusion results from the identity of the optical effects observed when certain bodies are placed in the phosphoroscope, or continuously exposed to the action of the violet rays.

5. A body submitted to the action of light may emit rays of unequal duration. This is the cause of the changes in tone of such a body when the velocity of the disc of rotation in the phosphoroscope is changed: it may be observed in the diamond, in the carbonate, phosphate, and silicate of lime, carbonate of strontian, hydrate of potassa, &c.

Among the effects observed in the same body we may often distinguish two predominating hues; but there may be more, as in the case of fluoride of calcium. These different luminous effects exist together, and are not produced successively; they appear in the phosphoroscope one after the other, by virtue of the unequal persistence of the rays emitted.

6. There is no relation between the refrangibility of the rays emitted and greater or lesser persistence of the latter. Every substance has its own peculiar action: either it is the most refrangible rays whose rays are most prolonged (carbonate and silicate of lime), or the contrary effect takes place (diamond, bisulphate of quinine, platino-cyanide of potassium). With the fluoride of calcium the rays of mean refrangibility have the least persistence; the least refrangible rays have a little longer duration, and follow the most refrangible rays.

7. A body may be influenced by rays of different refrangibility, and under the action of the latter emit rays which differ not only in duration but also in refrangibility; in this case the body presents rays the refrangibility of which is only less than that of the active ray, or, at the most, equal to it. Thus, in successively impressing a body with violet, blue, green, and other rays of decreasing refrangibility, the refrangibility of the rays emitted in virtue of the action peculiar to the body may vary, and, if it varies, exhibit only rays of less and less refrangibility, as prismatic analysis demonstrates.

In other words, the prismatic images given by the rays emitted by virtue of the action of the simple incident rays diminish in length from the violet side in proportion as the refrangibility of the incident ray diminishes and varies from violet to red. The changes of colour observed in caustic potash, fluoride of calcium, and sulphide of calcium, are due to this cause. Thus, when a body is impressed by orange rays, it can emit only orange or red rays; if it be impressed by red rays, it can exhibit only the latter colour. elevation of the temperature, which are not subject to the same laws.

In certain cases, in which is observed the emission of rays, in which the length of the undulations was less than that of the emitted rays, it is ascertained that the luminous phenomenon was complicated through the effects of the phosphorescence by the

8. The limits of refrangibility between which bodies are impressionable, that is to say, the length of the active solar spectrum, depend on the nature and molecular state of the body: in general, the limits are much more extensive when the light emitted by the body has a less refrangibility (as in alumina and aluminate of magnesia), without there being fixed rules in this respect. On the other hand, the spectra of the active rays may present many maxima of action, as is proved by phosphate of lime and leucophane.

9. The changes of colour certain bodies present, in consequence of the difference in the refrangibility of the active rays, are much greater when the bodies emitting the rays have more dissimilarity of refrangibility, and of which the prismatic images are more extended; but with bodies like alumina, the compounds of uranium, &c., in which these conditions are not fulfilled, the changes are scarcely perceptible.

10. Every body has its own peculiar action, and the composition of the light emitted by it may serve in certain cases to specify its physical state and composition: such is the case with albumen and certain of its combinations, the diamond, &c. In some instances, it may be seen that there is an action in a body due to its chemical composition and an action dependent upon a peculiar molecular state. Thus, for example, the diamond always gives an emission of slightly refrangible rays (orange and yellow), an effect due to the nature of the substance; and sometimes, only, conjointly with this effect, an emission of rays more refrangible (blue), of less duration, dependent upon a molecular state of the body, and to which is due the blue colouration in the ultra-violet portion of the spectrum. Other substances, as carbonate of lime, act in a similar manner.

11. The identity in composition of the light emitted by bodies placed in the phosphoroscope or exposed to the extreme violet rays, permit the conclusion that the causes of the light emitted by phosphorescence and by fluorescence are the same. Such are the luminous effects given by alumina, aluminate of magnesia, the compounds of uranium, and the diamond, which are identical, and lead to the same series of black rays and luminous lines in the apparatus and in the most refrangible solar rays.

12. Rays emanating from bodies in virtue of their peculiar action, when these bodies are placed in the phosphoroscope, acting, as it were, in a continuous manner, may give rise to other effects than to impressions on the retina: they render the phosphorescent substances luminous, and produce chemical actions upon impressionable matters, through their refrangibility and intensity, like the solar rays. Another *Memoirè* will be specially occupied with those effects which present a remarkable example of the transformation of physical forces in to each other.

These conclusions show the great importance of these new researches, the results of which may be brought to bear upon the study of many questions of molecular physics, and serve to throw light upon many points of chemical analysis, and permit us to grapple with phenomena which concern one of the least known branches of optics. J. P.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

PROPOSED UNIVERSAL COLLODION.

To the Editor.

Sir,—If the subject of collodion be not yet exhausted, and I am afraid from all I hear that that great desideratum, an universal one, is still looming in the distance, a few jottings from my note book may not prove unacceptable. The great object to attain in making a good collodion which shall have any pretensions to be called universal, that is to suit all operators, appears to me to be to get one that shall be extremely *soft, intense,* and keep tolerably well; for, generally speaking, if we put one description into two operators' hands, one will say it is excellent, all that can be desired, whilst the other will say it has no intensity whatever. If we now alter it to suit the latter person, the former will complain of want of middle tints. *It is not so difficult to make separate collodions to suit both,* but the difficulty is to get one and the same collodion to work well with both operators.

Having been experimenting for some time I have been inclined to follow a certain track, which seems to me to be the nearest approach and the most likely road to lead to success; and, first, I would lay it down as a rule that it is an impossibility for any one, with any collodion, any sort of nitrate of silver, a developing solution made up any recipe, to get sure results at all times; all must be properly balanced to before we can expect success.

Having made these remarks, I would commence by saying, that *softness* is of the greatest consequence in a good collodion; for it is possible by increased development and pushing with nitrate of silver to obtain intensity, but very difficult to obtain middle tints in a hard collodion, even by a prolonged exposure, the middle tints being weak, and the picture harsh, and devoid of atmospheric effects. This has been endeavoured to be overcome by the use of a bromide; and although by increasing the strength of the pyrogallic developer to the original Archer receipt, namely three grains to the ounce, with a little more acetic acid—a *sine qua non* when a bromide is used, but which does not appear to be generally recognised—a good picture may be obtained, as quickly as with an iodide; still it will be found much easier to get a successful result with the latter alone under some conditions of light, and, if the plan which I adopt be followed, both softness and intensity will be obtained with very little trouble. I first start with the softest pyroxyline I can get. I have been in the habit of using paper prepared with equal parts of weak acids at a low temperature. My reason for using paper has been from its giving a more soluble product than cotton wool; but since the discovery, by Mr. Hardwich, of the increased solubility of cotton wool made with excess of diluted sulphuric acid, and its superior keeping qualities when made into collodion, I am about to give the latter a trial, as I have just used up all my old stock made of paper. I cannot say, however, that I have met with that difference in pyroxyline made from paper that I have heard complained of: possibly making it only in small quantities at a time may account for this, and also washing with boiling water, which I think of great consequence in getting out all the bitter principle in the pyroxyline, which is not soluble in cold water or even ammonia. The greatest amount of water in the diluted acids of Mr. Hardwich I am told produces the softest collodion, which I should therefore prefer. The next thing is to dissolve it in ether, adding a large excess of alcohol; this opens the pores of the film and increases the intensity without giving a hard picture like the fibre prepared at a high temperature. It is doubted whether increase of alcohol after a certain amount does any good; it certainly may cause the collodion to be both slower and less intense if the pyroxyline be added in the same quantities as is necessary in an ethereal one for then the film will be too opaque, but I have found *more* alcohol and *less* pyroxyline both quicker and more intense than the contrary. Should this with some not be found intense enough, then neutralising the bath with carbonate of soda and adding acetic acid will be found of great use; for no one ever complains of too much intensity, as water soon rectifies that, and there is never any fear of staining with an alcoholic collodion.

The collodion I have been using contains ether three drachms, absolute alcohol three drachms, pyroxyline six to eight grains. Iodising solution—iodide of cadmium two-and-a-half grains, iodide of potassium two grains, absolute alcohol two drachms; triturate the two salts together and add them to the alcohol, shaking occasionally for two or three days.

The principle which I wish to establish from the above is to endeavour to obtain intensity by every means short of tampering with the softness of the pyroxyline, as there is no other means at present that I know of, of getting rid of *white washed leaves in foliage on a black board* as is so readily obtained in photographic views.

Trusting this may be acceptable to your readers,—I am, yours, &c.

FRANCIS G. ELIOT.

PHOTOGRAPHIC NICKNAMES.

To the Editor.

Sir,—The enclosed appeared in a Carlisle newspaper. Is it not a pity that "artists!" (?) cannot keep to words that every one can understand? I wonder what his "Photeikons" are like.—I am, yours, &c.

August 1st, 1859. C. A. B.

"Photeikons! Photeikons!!—M. F——'s Crystal Palace Gallery and Photographic Artarium is completed, and expressly fitted up for taking Portraits in any weather. Open from daylight to dusk. Opposite the Church, Botcher Gate, Carlisle—15.4."

[Will not the old proverb, "Good wine needs no bush," apply to the above *et hoc genus omne?*—Ed.]

LEAKE'S TENT.

To the Editor.

Sir,—Will you kindly permit me, in answer to your correspondent, "Oxoniensis," to say that I have, since I *first invented* the "dark tent" to which he alludes (nearly four years since), sent out numbers to different parts of the country, and some to the continent, and it is quite possible, therefore, that he may have seen one in use "of exactly the same construction." I think, with all due deference, he has chosen a somewhat illogical method of proving that I am *not* the original inventor. But, however, sir, if *a sketch and description* of the "trifle" will interest your readers, or help them in the practice of out-of-door photography, I shall be most happy to forward them, *with* my *latest* plan for *fixing the moveables.*—I am, yours, &c. J. H. LEAKE, Sen.

25, *Upper North Street, Poplar, August* 3*rd,* 1859.

[We shall be happy to receive the communication referred to.—Ed.]

BELMONTINE NEGATIVES.

To the Editor.

Sir,—You will please accept with the enclosed my best acknowledgments for your valuable suggestions appended to my paper.

Unfortunately there is an error in one of the formulæ, No. 6:—the nitrate of silver should be two scruples instead of eleven grains. Pray have this corrected in your next for me, though probably in a few days I may be able to send you an appendix. The enclosed is not quite after your formula, as the materials were not at hand, and there is some difference also in each of the other forms. The *mode* of operating has been followed which will be satisfactory to you.

I am endeavouring to still further shorten the method, by using an emulsion of the paraffine and albumen solutions together, and a picture now on the glass seems to promise good results, which, if so, will save one item in the process. In a day or two I hope to give you some proofs and some further details.

You must excuse me if I am not quite satisfied with your remarks on the positive appearance of some of the pictures: I am seeking for a solution of one or two points connected with it. There will not be time for me to send you anything more at this moment, and you will not, I am sure, object to soak the specimen sent a little longer in water.

(Turner's paper.) Picture taken at five o'clock in the afternoon, good sunlight; two minutes exposure; developed in fifteen minutes; would apparently have borne the pyrogallic more without discolouration; an alteration in each of the formulæ; the mode the one suggested by yourself; it seems the iodide is not quite removed; half-past six o'clock in the evening.—I am, yours, &c. * * * M.D.

Southampton, August 1*st,* 1859.

[Altogether a *very* promising result; fine detail; total absence of granulation; fair intensity; capable of further development if needful; and good half-tone.—Ed.

OPERATING DIFFICULTIES.

To the Editor.

Sir,—Seeing how kindly you answer your photographic correspondents in their difficulties, I take the liberty of asking you to assist me in getting out of mine.

In taking portraits in my operating room, which is boarded round to the height of seven feet, when the sun is shining right on it (from eleven o'clock till three) I shade it off entirely with white calico; but the pictures I get then are quite flat and grey, and do not even look well on the ground glass; but when the sun has gone off my yard, and the calico taken down, I get first-rate pictures, and the image looks quite clear on the ground glass. By suggesting a remedy in an early number you will oblige yours, &c. W. T. G.

Bolton, August 9, 1859.

[The boarding round the sides shuts off all lateral light, and the white blinds over the roof have the same effect as a *very dull day* in producing flat results.

Remedy.—Paint your room white opposite your sitter, and, instead of shading the whole room when the sun shines, be content with placing your sitter only in the shade, and let the sunshine stream into the rest of the space. It may be inconvenient, but it is the only remedy, except replacing the wooden sides with glass.—Ed.]

WOODWARD'S SOLAR CAMERA.

To the Editor.

Sir,—I have given some little account of Woodward's solar camera, and I know in time it will, from its merits, work its way into general use. Please find a space for it in your wide-spreading Journal.

I fear in speaking of the above I may, by some, be thought interested, being the maker and agent for the sale; still it is not a reason why the truth should be locked up. I believe I was the first in this country to purchase one of these instruments from Mr. Anthony, of New York, for which I paid him £15 in English money, and this, by adding duty and other expenses, amounted to fully £17. The same sized instrument is now offered for £13.

On receiving it I sent it to several meetings of various photographic societies to push it into notice, but little was said or thought about it.

I had an idea that I could very much improve upon it. I set to work, constructed two or three instruments, and made a trial with one of them; but having met with little success, I concluded that it would be more satisfactory if I built a dark room expressly for it, which I did at a great expense, and with this room succeeded no better. I then laid it on one side, putting it down as one of my follies. The American camera I had never used, although it had been in my possession full eighteen months.

At length the patentee, Mr. Woodward, arrived in this country, and I told him how unsuccessful I had been in all my attempts to work the solar camera. He offered to put it in use immediately. I even then thought I was going to waste more time and material, but I very soon found I had not the least idea of its simplicity and wonderful performance. The result of that day's work was truly astonishing, so much so that from that time I have wedded myself to it, and I feel convinced that, when it becomes more generally known, all photographers, lithographers, and painters on canvas or other surfaces, will provide themselves with one, and eventually artists will attach one or two to every suitable window in their house, and take advantage of all the light that comes.

About six years back I contrived an apparatus to enlarge photographs by a condenser and gas light, and I have no doubt many others have increased photographs in size; indeed, all say to me, when I am recommending it, oh, I have done this years ago! I admit they have done something of the sort, but can one of them show a portrait of any size without retouching that can bear comparison to one produced by this instrument?

I have shown it to several who were most difficult to persuade that it was anything new or worth notice till they saw it at work, and also saw the result. The first question subsequently put to me was—how soon can I have one? I do really believe that there is no photographic instrument heretofore discovered that will be of such service to the artist.

I have several large lenses; one, I believe, the largest in the country, which should bring me one hundred guineas. It is an exceedingly good one; still it is impossible to produce with this instrument, or any that can be made, a picture equal to that by the solar camera at £21, or even that at £13. The difference between the two sizes consists in the larger one admitting more light, thereby doing its work much more quickly.

If any photographer who may be passing through Liverpool be desirous of knowing the truth of this, I shall be most happy to convince him.—I am, yours, &c. JOHN ATKINSON.

37, *Manchester Street, Liverpool, August 2nd*, 1859.

[We received a visit from Mr. Woodward when here, and have also been invited by Mr. Kilburn to see the working of the instrument above described, but were unfortunately absent from town, and ill health and other pressing occupations has hitherto prevented our attention to it. We propose taking the earliest opportunity of examining the apparatus, but must confess we are not sanguine about finding any novelty, much less ground for a patent, as the subject is one to which we directed our endeavours with considerable success five or six years ago. See two papers in the first volume of *The Journal of the Photographic Society*, one by Mr. F. H. Wenham, and one of our own, both read on the same evening at the meeting of the Photographic Society.—Ed.]

ANSWERS TO CORRESPONDENTS.

J. L. Fysh.—See Mr. Church's article in the present number.

J. P. D.—A twin lens camera by all means.

John Bailey.—Your complimentary remark to our publisher has been forwarded to us by him. We return our best thanks.

P. F.—We never made the assertion alleged. We do *not* approve of the paper named.

Mayflower.—Certainly not. How can you expect it? See reply to G. Jones. Our time is far too valuable to waste in the way you propose.

* * * M.D.—Received too late for insertion in the present number. To appear in our next.

A Young Hand.—Your fault is under exposure. We should say at least twice as long as the time you gave for those specimens sent.

Argent.—A newly made nitrate bath is seldom fit for use in less than twenty-four hours after it has been made.

Ed. Taylor.—You can work more deliberately with an alcoholic collodion than with one containing excess of ether.

Crayon.—A treatise "On the Principles of Form in Art," is published by Messrs. Winsor and Newton, London. You will find all you require in it.

Bronte.—Castor oil is the only fixed oil soluble in alcohol; but all the essential oils are soluble in it.

S. S.—Pyroxyline is sometimes made with Swedish filtering-paper, but cotton is preferable because it is more uniform in composition.

T. L., Cannonbury.—Best thick Saxony paper—Knight's, Foster Lane; or else use Hollingsworth's paper—Cox, Skinner Street, Snow Hill. Formula in our next.

Cosmos.—Sulph*ides*, carb*ides*, used to be called sulph*urets* and carb*urets*; their nomenclature has recently been changed, to make them harmonise with chlor*ides*, ox*ides*, cyan*ides*, &c.

F. Franks.—You will perceive, by a note in the present number, that the same gentleman is at work upon the hint thrown out. A paper on the subject will appear in our next. The result is capital.

Clara Jones.—Photographic printing is an occupation well adapted for a female—in fact many of the professional operators employ females for this branch of their business in preference.

H. Moxon, Richmond.—If the collodion remains of a pale blue colour after long immersion in the nitrate bath, it shows the collodion is not sufficiently iodised.

Buffon.—The spots on your plates doubtless arise from dust left on them in cleaning. Use a soft brush to remove it before applying the collodion.

Pilgrim, Havant.—The nitrate of silver adherent to the collodion film dissolves the iodide as it dries, hence the necessity for a preservative solution.

G. H. Scriven.—The formula for Maxwell Lyte's toning bath is given at page 67 of the present volume. In preparing it, be sure that the chloride of gold is *neutralised to test paper* by the addition of solution of carbonate of soda, before adding it to the phosphate of soda.

G. Jones, D. Wright.—We cannot undertake to examine any lenses or other apparatus that may be sent to us for that purpose, except our consent be first obtained—and then only for the publication of such results as we may find of *general public interest*.

H. Hulme, Yarmouth.—Your lens has probably an imperfect focus, arising from the separate glasses being unadapted for each other. Cannot you return it to the maker, or get it exchanged? You could not expect much for the money you paid for it.

J. Sefton.—So many circumstances influence the time of exposure that it is impossible to lay down any fixed rules. Two or three experiments ought to suffice to enlighten you on this head if you know a good negative when you see it.

Paterfamilias.—We consider that you cannot do better than cultivate a taste for photography in your son. His sisters will also very likely be smitten, and you will thus produce a home attraction that will in all probability counteract the roaming tendency you deplore. Moreover, the associates among whom he will be thrown as a photographer will also tend to direct beneficially, without thwarting, his roving fancy.

A. H. B.—The error in the formula for obtaining pure whites in direct positives consists in ounces being given to each item instead of drachms. It should stand thus:—

Water	12 ounces.
Alcohol	5 drachms.
Acetic acid	5 "
Sulphate of iron	4 "
Sulphuric acid	1 drachm.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 101, Vol. VI.—SEPTEMBER 1, 1859.

The men of Manchester are not of a sort to lag in the rear when they ought to be in the van: in proof of this assertion, witness the establishment of the Art-Treasures Exhibition a few years back.

The managers of the Art Union of Manchester, as will be perceived on reference to our advertising columns, contemplate distributing, as part of their prizes for the current year, a certain number of *choice* photographs, bound in volumes. Although the council of the London Art Union last year made arrangements for presenting to a portion, or all, of the subscribers photographs of some kind, and consequently so far took the lead in introducing the thin end of the wedge, we cannot but regard the committee of the Manchester Art Union as being really the first public body formally to recognise photography as a branch of the fine arts — the London council having only permitted it to occupy the very subordinate position held by the Associate Engravers in the Royal Academy, they being allowed on sufferance, as hewers of wood and drawers of water, to *copy* the creations of those supposed to possess a higher order of talent: so in the London Art Union, the photographs allowed were strictly confined to "copies of works of art;" and these not distributed exactly as prizes, but in addition to, or instead of, the usual engraving presented to each member.

The Manchester Committee has thrown aside these restrictions altogether, and is content to let photographers that are artists indeed take their places besides their brother workers in the field of the beautiful, the simple stipulation being, "use your own weapons be they what you please, *but use them with your brains and conquer*."

That photographers are ready to take a place amongst artists we have before now seen, in fact we have already been singing to this same melody in the present number; and, though that place may not be as yet quite so sharply defined as some of their own productions, the niche is ready and will no doubt be worthily occupied. We trust that some of our brain-working manipulators will heartily respond to the invitation so cordially given, and prove to the world that the confidence displayed is not premature.

It has been already announced, in the official organ of the Photographic Society, that the Gallery of the Society of Painters in Water Colours has been secured for the Photographic Society's next exhibition, which it is contemplated to open in January, 1860. We should have been better pleased had the same rooms occupied last time (those of the Society of British Artists, in Suffolk Street) been retained, as not only is the space available in the latter considerably more extensive than the former, but we are convinced that the continual change of locality is highly detrimental to success as regards the attendance of visitors. We are pleased to observe that our good friend, the Editor of the Society's Journal, is urging upon practical operators the desirability of more general attention to the artistic treatment of subjects, and pointing out that direction as one in which there is a larger opening for an advance than in manipulation.

At the last meeting of the French Photographic Society, two papers were presented by M. l'Abbé Laborde, one being on the details of some experiments that appeared to the author to contain something novel, but which in reality simply demonstrate the fact that French landscape lenses are not so well corrected for spherical aberration as those made in this country; the second, a translation of which will be found in another column, being of a far more important character, very conclusive, circumstantial evidence being adduced to prove that the so-called "new action of light," of M. Nièpce de St. Victor, is due to the formation of *formic acid*. We are glad to find that the chief representatives of photographic science in Paris are beginning to admit that in this instance it is just possible that the celebrated physicist may have made a mistake.

In the pages of a contemporary photographers have been favoured by a recommendation to procure collodion from several sources and mix them all together, in order to acquire an article of average quality and uniform character. The recommendation is based upon the assumption that makers of collodion produce anything but an uniform article—an assumption, by the way, indignantly denied by one of the said collodion producers; but however that may be, we cannot perceive the soundness of the reasoning by which it is contended that the admixture of a dozen *indefinite* compounds can bring about the desideratum that the resulting mixture shall be uniform. If the assertion be only intended to apply to the quantity mixed at any one time, we are as far off from the desideratum as ever, for surely the same result would follow from mixing the various differing productions of any one maker. The proceeding appears to us very like cutting off the tails of the rabbits to make them uniform with the Guinea-pigs. In other words, spoiling the good in order that the inferior may not seem utterly worthless.

British Association: Aberdeen Meeting, 1859.—We are authorised to state that the time for sending in photographs for the Exhibition to be held in connexion with the above has been extended from the 1st to the 6th inst.

As a Scottish trip will certainly be highly popular at the present time, we have no doubt that photographers—professionals especially—will find this opportunity of bringing their works under the notice of many who would not otherwise see them at all of great advantage. Indeed, we regard the holding of an Exhibition in a locality not often thus favoured as sowing seed which, in the future, will yield a very abundant harvest.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

Since our last notice under this head we have been favoured with two or three new productions, which may truly be classed as belonging to the school of photographic high-art.

The resolution passed last year by the Council of the Photographic Society (and subsequently rescinded), relative to the non-admission into the Society's annual exhibition of such works as had been previously displayed publicly in London, is, we believe, operating at the present moment in some quarters as a restraint upon the publication of several works of considerable merit; but, as there can be no objection to the communi-

cation of a description of some of them, we purpose giving our readers the benefit of what we may call our private view.

While on the subject of the resolution to which we have made allusion, we may remark that, in our opinion, the error committed in the first instance, and of which the after reversal was not the proper remedy, consisted not so much in looking coldly on works with which the public had already become familiar, from their exposure in the windows of the numerous dealers in photographic productions in London, but in proposing to exclude them altogether. We conceive that every requirement would have been met on both sides by a regulation to the effect—"That *new* works, of equal merit, should take precedence of those that had been elsewhere displayed, even to the exclusion of the latter, in case of paucity of space." As we retired from the Council at the last annual meeting, we shall not have an opportunity of proposing such an arrangement for the ensuing occasion; but there are still on the Council many members with whom we were lately associated, who are animated with an earnest desire to promote the cause of photography, even though it may be to their own personal disadvantage, and we shall probably commend such a proposition to the notice of some of them.

We have been betrayed into a digression, not perhaps exactly foreign to our subject, but certainly into a track — speaking in railway phraseology — that terminates only in a siding. Let us resume the main line ; and first we will notice

"God Speed Him!"—by our photographic Rembrandt, which is a companion picture to Mr. Rejlander's previous production, *The Wayfarer*, and in which further details are revealed to us of the antecedents of the poor weary traveller in whose refreshment we formerly sympathised.

In the present work we are introduced to the faithful helpmate of the wayfarer, a woman past the middle age, sitting listlessly, apparently buried in anxious inward contemplation. She is neither thin, nor handsome, nor is she fashionably or gaily drest — no crinoline, no flounces, but clad in the homely cotton gown and woollen handkerchief befitting her age and station in life. Stretched over her left hand is a half-darned stocking, which hand, however, she also employs as a support for her chin, while the right hand, armed with needle and thread, lies carelessly and idle in her lap. On the right upper corner of the picture the subject of her thoughts is plainly hinted — her husband is seen toiling up the steep ascent in the distance; hence the exclamation which forms the title.

A tea-pot, two empty cups, and a dilapidated tea-caddy on the table, and a basket with some articles of clothing, the well-used Bible, and a half-open letter on a low stool beside it, all tend to intimate that the husband's journey has been hastily undertaken, and that the wanderer has not been allowed to depart without refreshment for both mind and body.

As a photograph this work certainly excels the former one in manipulation, excellent as that was. As a further revelation of the hopes and feelings that interest us it is highly satisfactory; but as a work of art we scarcely like it so well as the first of the pair.

Mr. Rejlander can well afford that we criticise: if we be right, no one will be more ready to take a hint; if wrong, we do not fear from him the imputation of ill nature.

The subject is illuminated from the spectator's *left* side, whilst the old man seen in the distance is visible through an oblong aperture, that may stand for a window, on the *right*. But this is not the way we read it; we take it *for a visible suggestion of the woman's thoughts*. If it be a window, the light on the figure is in the wrong direction; if it be, as we believe, a mental phantom, rendered apparent to the eye, the outline of the phantom subject is too hard and formal. In either case, Mr. Rejlander is too clever an artist not to be able to remedy the defect; and we have no hesitation in asserting that even in its present condition it is a pleasing and valuable addition to our art productions in the photographic department. As will be seen from a letter of Herr Pretsch's amongst our Correspondence, both negatives were taken with one of Professor Petzval's lenses, of the construction known as "orthoscopic," though the learned Professor repudiates the designation.

Next on our list we have a very charming composition by Mr. Henry P. Robinson, of Leamington, the producer of several very meritorious and highly popular conceptions, including that touching episode known as *Fading Away*. The new work is entitled

"Nearing Home," and consists of a skilfully-arranged group of three girls, resting on a mound in the vicinity of a town towards which their steps have been directed. They are evidently wearied with a long day's ramble: the principal figure is standing on the apex of the mound, with her back towards the spectator, her hat thrown aside, and, with her hands shading her eyes from the rays of the setting sun, is looking towards her home in the not very distant mass of houses. Of her two companions, one is seated with her face in profile partly turned towards the same spot, while the other, completely overcome by fatigue, has thrown herself at length on the sward, her head partly supported by her hand.

On the right is the slope of a hill, on which a female figure is reclining; and in the centre, at some distance, is a stream spanned by a bridge, a cluster of houses being seen on the opposite shore, while the horizon is bounded by a chain of hills covered with verdure.

This is of course a composition from several negatives, and the various gradations of intensity and general evenness of tone are beyond all praise. There is somewhat too great an amount of indistinctness about the extreme foreground, arising from a cause we may presently advert to; and, graceful as the group is, it has perhaps a little too much of artificiality to be perfect. The foot of the reclining girl, which unfortunately comes too near the angle of the picture, is, in consequence of the optical quality of the lens, considerably exaggerated in size. We cannot shut our eyes to the fact that there are faults, nor would it be right that we should do so; but the composition is one that will be eagerly sought for by all lovers of the picturesque and graceful, and the printing and general manipulation are such as to leave nothing for fault-finding. The "sharpness" and amount of detail do not in any way detract from general breadth of treatment, but on the contrary remove the chief failing to which "breadth" is generally liable, viz., too great an amount of indistinctness and want of finish. One sure test of excellence is exemplified in this production — *it wins upon the beholder by frequent inspection.*

The last to which we shall refer for the present is another subject by the same able artist, and is entitled

"Preparing to Cross the Brook." It is an incident in the day's wanderings of our same three little friends — time high noon. The cool waters of a stream are in the foreground, and more of the brook itself is seen winding away in the distance on the right. The banks are steep and rocky, but their natural ruggedness is softened by the graceful fronds of numerous ferns. The scenery reminds us of some parts of the north of Devonshire.

The central figure, the youngest of the three girls, is seated on the bank at the water's edge, and, having already denuded herself of shoes and stockings, is tucking up her petticoats preparatory to wading across — an operation to which she appears by no means disinclined, the refreshing coolness of the stream being decidedly agreeable in anticipation. On the right, another girl, seated on the ground in a very natural attitude, is in the act of taking off her shoes, whilst on the left, a third is lying down at length on some flat rocks by the water's edge, as if thoroughly wearied out. This however is the weak point in the composition; for although the *pose* is otherwise natural, the head is lower down than the body, and the attitude could not consequently be maintained with any degree of comfort for more than a few minutes at a time. The left hand, and both

feet of the girl to the right side of the group, being in the corner of the composition, are very much enlarged. With these two exceptions, and indeed in spite of them, the whole calls forth a very favourable verdict. The shadows are deep and transparent, the half-tones delicate in the extreme, and, like the subject previously noticed, it is most artistic in treatment.

Artists of every kind, photographers especially, will we are certain accord to Mr. Robinson a well-merited tribute of praise. The printing is most carefully executed, the tone pleasing, and in both cases the grouping is extremely well managed — unity of design being united to variety of *pose*, and the whole extremely well balanced.

It is with considerable regret that we learn the negative of *Nearing Home* has been injured, we fear beyond remedy; but we trust that the hand that executed it has not lost its cunning, and that another edition may take the place of the first.

Both of Mr. Robinson's works have been executed with one of Ross's orthographic lenses, of twenty inches focus, which the former finds to answer his purpose for groups better than the portrait combination.

It is owing to the use of this lens, which covers a large area for its focal length, that the indistinctness of foreground in the first and enlargement of the feet in both pictures are due. The lateral rays do not come to a focus until farther from the lens than the central rays, hence the flatness of field and consequent definition on a flat surface; but as increased distance from the lens implies an *increase in the scale* upon which the delineation is effected, a large angular field of view, coupled with a flat plane of delineation, are incompatible with one another without a sacrifice in some direction. In landscapes, the increase of scale is of but little moment, but for figures it is better not to work the lens so as to strain the amount of field covered. The indistinctness of foreground would be remedied by slightly "cocking" the camera; but this would form no palliation for the enlargement.

We are glad to find that Mr. Robinson employs a camera made by a common carpenter, of pine, which we are assured wears as well as the more expensive articles.

FURTHER MODIFICATION OF THE WAXED-PAPER PROCESS.

By * * * M.D.

Desirous to avail myself of the suggestions appended to the article, entitled "Modification of the Waxed-Paper Process," in your last number, and several solutions at hand being suitable for the purpose, I proceeded on the 1st ult. to prepare some papers, of different kinds, by the suggested, and others by an abbreviated method, using the same materials in both.

You advised procuring an albumenised film to work on; already I had tried some albumenised paper (Marion's positive) and some foreign plain, by first iodising without albumen, then using the paraffine solution, and when dry sensitising, but was disappointed. In the first case the paper became almost black when developing, in the second the paper by transmitted light was spotted and the picture very variable; hence I suspected some difficulty.

Being without bromide of ammonium, the following proportions were mixed: —

Albumen twelve drachms, strong liquor ammoniæ twenty minims, beaten together for five minutes; to which was added, when dissolved, a solution containing iodide of ammonium eight grains, chloride of ammonium two grains, bromide of potassium four grains, clean rain water one drachm, then filtered through double linen. The papers were singly floated on this from four to five minutes, then dried before the fire; here there was some trouble, as the papers set in wrinkles, and the albumen solution tended to run into the hollows. To avoid this, on lifting the papers from the liquid, a glass rod was made to gently follow the draining fluid; the film then seemed to set more evenly. I confess, nevertheless, that in more than one case I found the film somewhat disturbed.

When dry, the papers were immersed singly for five minutes into the following:—

WAXING SOLUTION.

Bees-wax, scraped fine	20 grains.
Paraffine oil	1 ounce.

Put into a bottle, and set in hot water; when the wax was dissolved there were added —

Crushed iodide of ammonium	each 10 grains.
Iodine	
Paraffine oil	1 ounce.

This solution had been made some time previously.

After a little time it becomes dark greenish, and gives a sort of tarry deposit with the solid parts of the wax, and sometimes sets in globules on the inside of the vessel, which when smeared on the finger smell of tar and iodine, and are rather difficult to wipe off; thus it requires to be filtered for use. The papers, when removed were pinned up to dry in the air — the thinnest paper (Canson's) took the longest time. After drying, they were floated on the following:—

SENSITISING SOLUTION,

Which in other experiments had given more regular results than that of formula No. 6 in your Journal of the 1st ult., where I see an error has been made. It should have stood — Nitrate silver forty grains, instead of eleven grains. Thus: —

Bromide of potassium	1 grain.
Nitrate of silver	40 grains.
Distilled water	2 drachms.

Mix.

Then add gradually water ten drachms, Beaufoy's acetic acid four drachms; thus differing from No. 6 in the substitution of bromide for iodide of potassium, with less acetic acid.

All the papers were floated on this, albumenised side downwards. A difficulty presented itself with all but the thinnest — they curled upwards so strongly that they *could not be left* to themselves, but were obliged to be kept down by alternate pressure on the edges: this, perhaps, may be avoided by damping the back; strongly breathing on it did not answer. After floating four to five minutes, they were removed to clean fresh rain water, and floated one minute; removed to blotting paper; pressed; then placed between some clean leaves of the same, and put to dry in a drawer covered by yellow paper.

In the interim I was induced, from some experiments made the previous week (but not alluded to in my former communication), to mix four parts of the albumen solution with six parts of the paraffine solution. They united as an emulsion. Test papers were separately placed on it: Turner's I could not float without soiling the edges, so immersed them; for five minutes longer would have been better. When dried, they were all sensitised as above, by floating one side only, &c. To hurry the drying of one of the first prepared papers it was wrapped in blotting paper, and placed in the breast pocket.

A picture was taken at five p.m., two minutes' exposure; another three minutes' exposure, fair sunlight: the first developed in fifteen minutes, the second in less. The former, with a few lines, was forwarded the same evening for your inspection. One of the papers on the emulsion plan was exposed a little after five o'clock for the same period; and, considering the hurried manner in which the papers had been prepared, I fancied, when on the developing glass, gave promising results, as was stated in the note. Enclosed you have the picture of first plan obtained on three minutes' exposure, and the first by second method, with sundry others. The former gives a good chance of success to the painstaking: the second, though effected by a saving of time, has a faulty-grained appearance. Turner's paper of 1850 has furnished the best proofs.

Several pictures by the first plan were failures from circumstances under control, and now only mentioned to show the care required: such as that placing the warm fingers on the back of the prepared paper, though in contact through a piece of black paper, produced less sensitive spots; some arose also from particles of the edges of the papers having floated on the surface of the albumen solution, and having been drawn across the paper by the glass rod; another by forgetting to wash and wipe the rod after use before applying it to the surface of another paper. The most general failure was from leaving the albumen paper in too short contact with the paraffine solution, or too brief a time on water before development, to remedy which I now prefer to immerse them.

The developing solution was changed to this: —

Pyrogallic acid	6 grains.
Beaufoy's acetic	2 ounces.
Pure rain water	6 ounces.
Alcohol	1 drachm.

and used without any other addition than one drop of a 30-grain solution of nitrate of silver to each drachm. The papers were laid face down on this poured on a level glass plate. Some placed in gallic acid, previously described, gave only a weak picture after two days. I have remarked that the chemical interchange seems to be

completed when the papers are removed from the sensitising solution to water.

To compare with the paraffine process as now described, I hand you some specimens taken on albumenised and non-albumenised paper, prepared with its rival belmontine, with the addition of ten grains of bees-wax to each ounce of the formula noticed in your former number. It gives clean pictures and withstands the developer well; the paper is less stiff. I should have tried pressure but was without a press or mangle.

In applying the developing solution I place the glass plate on the edges of a wide stone glazed pan, by which plan you can manipulate easily. It is right to state that the papers prepared with belmontine *without* wax have not kept well.

With the rest is a failure, a negative taken by Chamblant's (I believe is the name) single cylindrical spectacle lens, given me many years since by that ingenious and successful optician, M. Nachet Fils. When trying this lens, I remarked that objects of a blueish or lavender tone appeared on the ground glass of much deeper tint, and that the picture developed very quickly. In some of the negatives forwarded you will find that the albumen solution has been omitted. The thin hard paper, marked July, 1858, to which you called attention in the previous negative sent, was, I believe, from similar proofs at hand, Marion's thin plain paper treated as stated and re-waxed with a *very hot iron;* they were about the first negatives in which I adopted the quick method of developing.

Permit me now briefly to allude to your courteous remarks on the positive appearance in some of the previous negatives. You say a slight deposit of silver has been formed on the back, &c. This may be the case. By burnishing I could not give a metallic face to the deposit. Why should the daguerreotype semblance be only on the back of the paper? You suggest it had been sensitised both sides; this possibly was the case with those sent, yet I have found it occur when the paper has been sensitised only on one side, or rather when only one side has been treated to all the solutions. Again you suggest slow development; now I found it where the action was rapid or in the quick mode of developing, the slow plan with the same exposure not giving like results. Over-exposure, at least so far as I can judge, appears necessary to so modify the materials, or produce that condition of the organic matter that other substances are known to supply, when added to silver solutions. Still, whatever the cause, we are I believe in doubt for a fair surmise as to its being visible only on the reverse side of the picture. Your indulgence will, I am sure, see in the foregoing remarks only a desire to arrive at a more perfect explanation of a curious appearance, and also I hope excuse the length to which this contribution to your pages has arrived, which, should it lead to any satisfactory results in the hands of your readers, will amply gratify the writer.

[In addition to the remarks upon the above made elsewhere, we have one or two to add here.

The papers prepared with the albumen and other solutions mixed as an emulsion appear to have produced streaky pictures. By far the *best* results (these being *very* good) are where the paper has been albumenised and then treated with paraffine or belmontine oil with wax, &c., as indicated; and of these two the former is in our opinion superior. We consider the process well worth the attention of practical photographers: density and detail, half-tone and sharpness, all find their due place.

With respect to the cylindrical lens mentioned in the paper, our contributor appears to have forgotten that as it is an uncorrected one the chemical focus is nearer to it than the visual one, hence the want of distinctness in the photograph taken by it.

We have several times thought of employing such a lens; but to make it effective it should be mounted with a diaphragm of peculiar construction. We may enter upon the consideration of this in a future number.—Ed.]

EXPERIMENTS IN PARALLEL DIRECTIONS.

It was remarked to us some time ago, that "an editor has need of the hide of a rhinoceros," certainly his equanimity should not be too easily disturbed or he runs a risk of having but a sorry time of it. We have occasionally had to put up with personal observations somewhat of the roughest, but upon the whole we are very fortunate in this respect, for the kind and courteous remarks with which we are not unfrequently favoured outweigh those of the opposite character more than tenfold.

Our present trouble (although *we* are personally involved in grievous charges also) is to keep the peace between our contributors. Who could have supposed that the above innocent heading would have given offence? Yet such appears to be the fact, as will be seen from a letter which follows, and which we have received for publication.

As in that letter many unreasonable charges are made, and in our opinion some unfounded claims to priority are put forth, we purpose replying *seriatim* to the observations; but in order to let the writer have perfectly fair play, we shall give the letter in its "native purity," adding only a few *numerals* as guides to the points against which our replies will be directed.

Lest our readers may regard some of the phrases and epithets employed as rather opprobrious, we may remark that *we* have learned to take them in a "Pickwickian sense," being assured that they proceed rather from energy of character than from malice; and that in matters of opinion, though we may take a very opposite view from that of our correspondent, we have a very high opinion of his chemical acquirements.

We will, therefore, without further preface lay before our readers the letter alluded to, simply remarking, that though bearing date 2nd August, it did not reach us until the 13th of the same month.

Edinburgh, Wednesday, 2nd August, 1859.

Sir,—I have just been looking over yours of August 1st: so far very well. Your critique is not bad; but farther on—(1) As to your "M.D." paper I must, without personal offence, tell you I am getting a little tired of a certain sort of "Parallel Researches." No sooner is my pamphlet out then we have, first, the precipitation of *silver-oxide* parallelised by Mr. Hannaford, and next "M.D." comes out and parallelises, from the same pamphlet, my recommendation of *paraffine* and solution of wax in *benzole,* and the albumen on *waxed*-paper (recommended by me long before, but brought forward again formally in it). A pamphlet of limited space does not permit giving more then the general outline or *principles,* so that *if this system is to go on* it will be easy enough for a set of fellows who never had the *gumption* to *start* a single *new or original* idea to *parallelise* every fraction of it *bit by bit,* and leave me no merit whatever. The suitableness of certain substances being *once* pointed out to the public, I am only delighted to find photographers following my recommendations and favouring the public with their experience as to the *best* proportions, &c. &c.; but it is rather too bad to find them thus *uniformly* ignoring, and *frequently ostentatiously parading* their ignorance of the *original* recommendation whence they are manifestly derived. I could now name some dozen or so of cases in which the same has occurred. Scarcely three weeks generally elapses, sometimes not many more *days after* my publication of a novelty, the result, perhaps, *of much chemical research* and *investigation,* but what it is *parallelised* in this way by some man who, however good a photographer, or however *industrious* a dabbler in experimenting he may be, has never before shown the slightest ability for *finding out* any thing really new for himself. (2.) It is the solid paraffine which is *chiefly* pointed out in my pamphlet: although I have recommended the liquid also strongly I have not been yet able to get it so pure or free from unpleasant smell as to be at all very agreeable to use.

(3.) But in the paper "On albumen, or waxed and similar papers," which I sent you, which ought to have gone in, instead of the miserable little scrap which has gone in, you would find the *liquid* paraffine also *especially* noted under its more proper and especially distinctive cognomen of *rupion.* I do not mean to blame you of course for not putting it in already (as thinking there might possibly not be room for it along with the rest, I especially wished it as "for insertion in the Journal after next"), still, as you have put in the fragment which was only the rough draft of the beginning of it, and never intended for publication in that form, it will now be obviously *essential* that, in publishing the proper formula (which you have) *in the next,* you *prelude* it with an editorial notice that it was sent you and in your hands for publication long before August 1st, and that the "albumen process," by me, in August 1st, was merely the rough scrawl of the commencement, published instead of it by a mistake.

The rough elementary draft was sent up along with the "collodion process," and the *full* and *fair copy* followed with the interval of only one post, *written on a sheet of yellow paper like this,* and with the ratification which I have quoted above at the head of it.

I *must not* have it *lost* or *omitted* in your next.

(4.) I am disappointed to see that even the errata, corrected and necessary emendation made on the said rough scrawl, *when the proof of it was sent down,* have not been attended to; *e.g.,* the pyrophosphate being given in grains and the phosphates in atoms, which looks very absurd.

However, the correct copy in the next Journal, coupled with your editorial notice of what it is, and *when* it was received, will put this to rights.

(5.) You have not noticed or acknowledged in any way, the platinum-toned specimen I sent. It cannot have miscarried.—Yours, &c. C. J. B.

P.S.—I am much amused at the guarded way in which, while probably quite ignorant of them, "M.D." *cautiously* keeps a loophole open for the *after*-discovery of "chemical considerations," in case, I suppose, I should point them out for him, as I dare say he has a *guess* that chemical reasons *there*, as well as elsewhere, generally are at the bottom of my recommendations, as they most assuredly are.

I am the last one to grudge any one the credit rightly due to formula making or settling of best proportions; but what *I do* object to is the first trier of any new process not being content with this, but *uniformly* and, without exception, attempting on the strength of what he has, or possibly enough has *not*, settled, by some dozen or half-dozen of experiments, taking the credit for also what he has not given as the slightest reason for believing that, if granted a Methusalean longevity, he would ever have expiscated from his own cerebral organs.

You have, in your leading article, most forcibly drawn attention to the absurdity of our prize offerers classing the mere producer of a picture, or successful *worker* of a process, in a grade of higher merit than the discoverer of the process by which it is produced. On the same grounds these attempts of *mere* formula-compilers to monopolise the merit of everything new are equally preposterous; indeed, they show *their own* consciousness of the *inferior merit* alone which their experiments can *rightly* claim by their uniform attempt to claim *also*, and at the same time, the merit due to others. I dont depreciate their merit when they have had any *real* difficulty or obstacle in manipulation to overcome in bringing the suggestions of the originator into practice, or reducing them to an available form, for the public use. Neither I nor any rational discoverer will *grudge* them this. *Too* often, however, the application is perfectly simple, and all *plain sailing*, so that they see well enough their *proper* share of credit would not satisfy their appetite. Hence their *uniform* ignoring of that has been published one, two, or three weeks before, *as a matter of course in some Journal which they never see*, or pamphlet which they have *not* read.

After my *former* explanations as to yourself, you must of course not *again misunderstand* my criticism of what you only want to see to disapprove.

The honest course would be simply for the *improvers* or *adopters* to state formally *what difficulties* they *found* in any process *as given* by the originator, *and how* they have overcome or remedied them, and then let them leave it to the public to give them their *fair share* of merit *in proportion* to the original imperfection and difficulties of the process as given, and *the amount of labour and* INGENUITY NECESSARY to vanquish them. This *fair* share of merit, in proportion to the real *head work* involved, I should be the last to grudge. The system I do complain of, however, is on the other hand, far worse than even that prize—"lollypop"—system which you so forcibly cut up in your *leader*, inasmuch as no one is obliged or can be obliged to subject himself to its operation; while *here*, again, there is no choice, and you are "*paralleled*" at once without leave asked or given.

Fomula making, properly conducted, might, though often hardly necessary (and most highly appreciated by those who require *spoon-meat*), might still be *often* useful and *convenient*, as well as meritorious, *in proportion* to *real* difficulties *surmounted*; but *this* systematic *parallelising* bids fair to be the *paralysing* of all real discovery, as no one is likely to *continue* his researches, *or at all events* to give *them* FREELY *to the public*, when *sure* to be *paralleled* in this way, within two or three months, weeks, or days. I know that you have only to look at the matter to see as I do, that this is going *rather too* far.—In great haste, yours truly,

C. J. BURNETT.

The perusal of the preceding fairly takes away one's breath, and it is really difficult to know where to begin in reply; but we will make the attempt.

1. As regards Mr. Hannaford, we have already expressed an opinion—that opinion we see no reason to change.

With reference to the papers of * * * M.D., which appeared in our number of the 1st ultimo and in the present one, we have to make two assertions, which take them out of the category in which Mr. Burnett has placed them.

First, we have *specimens before us* (and had them when we published the paper) that were produced in July, 1858, ten months prior to the publication of the pamphlet.

Second, they are *not* copies of any suggestions in the pamphlet, which consists, by the way, of sixteen octavo pages, and though applying to negative processes upon paper, is very similar in style and principle to Mr. Burnett's paper "On Positive Printing Formulæ," which has already appeared in our columns. As the pamphlet is anything but *light* reading, we do not expect that the circulation is very extensive, and therefore one can easily conceive that there are many photographers who have never even heard of it, much less read it.

We have carefully looked through the copy last sent us by the author as complete, and all we can find in reference to the subject is the following, pages 8 and 9, which we extract, viz.:—

C.

"[*a*] In the case of papers prepared with simple solutions of cereoline in alcohol, or wax in turpentine, naphtha, or benzole, or gutta-percha in benzole or benzine, to be iodised afterwards, the salting, &c. by the baths already mentioned presents no peculiarities of any great importance.

"[*b*] And the same applies to papers prepared with solutions of paraffine, palmitine, or a weak solution of gum-lac and other resins in alcohol, either along with or without wax, on which I have made some experiments.

"[*c*] But the most convenient plan with these papers is of course the introduction of the iodides, &c. into the solutions we have mentioned in [*a*] and [*b*]. Many of the organic salts recommended by me are insoluble in alcohol, but others are more or less soluble, as some of the formiates and benzoates, and the succinates of soda and potash. The chloride of cadmium is also soluble in alcohol, and might thus be used with the bromides and iodides, with or without the organic salt of cadmium."

D.

"Films of albumen on plain paper or on wax-paper, or paper prepared with solution of gum-lac or other resin in alcohol, or of gutta-percha, india-rubber, gum-dammar, or copal, in turpentine, naphtha, benzole, or benzine, may be salted with the same mixtures of iodides, &c., with organic salts, or of iodides, &c., without the organic salts. The cadmic salts, from their coagulating albumen, cannot well be introduced into its solution, but can be introduced by preparing first with simple albumen, or its solution, and afterwards floating the albumenised surface on the solution of the mixed cadmic salts."

2. It will be observed from the preceding that it is solid paraffine dissolved in alcohol, turpentine, naphtha, or benzole that is spoken of, and we can hardly regard so obvious a variation on what is already practised as a new suggestion—with the exception of the introduction of the iodides, &c. in these solvents. Now * * * M.D.'s paper was prepared with a fluid, oily substance, of a red color, more or less volatile, extracted from peat, and known as *paraffine oil*, a cheap and easily procurable substance very different from the solution of paraffine in alcohol, &c., it being in this oily substance that the salts quoted HAVE BEEN PROVED by * * * M.D. to be soluble, a fact that could not have been suspected *primâ facie*. This, be it observed, is not a mere hint that such a proceeding may do, but an accomplished fact *proved by the production of many good negatives*.

3. The section of the letter which we have indicated by this number is so startling that we shall reply by an anecdote, for the truth of which we can vouch:—A neighbour of our own was frequently annoyed by an old lady, neither too slim nor too scantily clad, who would persist in occupying a seat in his pew contrary to his wish, and to the consequent exclusion of one member of his family, and the material discomfort of the rest. Several appeals to the pew opener being found useless, our friend tried the clergyman, who, of course, replied that such a nuisance should be put a stop to, and inquired who it was that was so persevering? On being told, his countenance fell, and he said, "I am afraid it is a hopeless case, for Mrs. —— is that sort of woman, *that if she chose to occupy the pulpit, I should have to preach from the reading-desk!*"

It is perhaps needless for us to say more than that we are *not* so complaisant as our clerical friend.

Our correspondent is in the habit of writing to us much that is intended for publication, and still more that is not, all mixed up together, so as frequently to render it impossible to separate the two; much is often repeated in various forms, and *all without exception* written in a style that he himself has most properly designated as κακογραφια, and which is rarely readable except with the penalty of a splitting headache. Moreover, he appears entirely oblivious

of the fact that from Edinburgh to London is a day-and-a-half by post, while from London to Liverpool takes another day, and we may just insinuate that we are not always at hand precisely when the letters arrive, nor always at liberty immediately to deal with them. How is it possible for us to know when a complete copy is to come by the next post unless it be intimated in the first, and if it be, more often than not it does *not* come. Besides, many notes bear no date at all, some only the day of the week, and when they do bear the day of the month, as in the present instance, the letter is frequently not posted until many days afterwards.

4. The errata complained of are due *entirely* to our correspondent, his corrections (!) were so unreasonable and arrived so late that it was just *impossible* to attend to them.

5. If Mr. Burnett will refer to page 194, he will perceive that we did notice the specimen sent in the very first "Answer to Correspondents."

The somewhat extensive postscript being to the same tune as the body of the letter, does not need any special remark. We cannot, however, conclude without stating again that while we *highly appreciate Mr. Burnett's chemical talent*, and believe him to be perfectly sincere, we do think *that he errs greatly in judgment* in supposing that because he somewhere, at some time, has said, that this substance *may* be used, or that one *deserves* a trial — that he is thenceforth to be considered as the originator of all that may be practically successfully carried out by others in connection with those named substances; and still more does he err in imputing so generally as his words imply the base actions which he indicates.

That Mr. Burnett has suffered from gross plagiarism in some cases we are ready to admit; we have fought his battle when we have thought him wronged; we hold him in high esteem; but we we will oppose him when we think he wrongs others, though in so doing we do not charge him with more than taking a jaundiced view of things, and we are convinced that he mistakes his photographic brethren generally, as much as he is mistaken by them, and that is not a little. If they were only more thrown together perhaps all would find out and exclaim, that we are "Not so bad as we seem!"

ON M. NIEPCE DE SAINT VICTOR'S RESEARCHES ON LIGHT.

By M. L'Abbé Laborde.

In repeating the experiments of M. Nièpce on the persistent activity of light, I remarked, from the first essay, a characteristic difference between the effect produced by solarised paper and that resulting from the direct action of light.

When sensitised paper is exposed for a few moments only to the direct action of light the colour it assumes is wholly external or superficial, and disappears entirely if the surface is lightly scratched. But if the paper is submitted a longer time to the action of light, until it acquires a colour nearly equal in intensity, this colour is not merely external, but it penetrates the entire thickness of the paper, and appears on both sides: we perceive that the sensitised paper has been impregnated rather than impressed, and we are led to admit an emanation rather than a radiation on the part of the sensitised paper. The following experiments leave no doubt on this point:—

To avoid useless repetition, it may at once be stated, that in all these experiments a piece of thin cardboard, impregnated with tartaric acid, was exposed to the sun's rays for about four hours, and afterwards placed in a tin box, to the shape of which the paper adapted itself. The size of the box was seven inches by three.

The sensitised paper, prepared as for ordinary positives, was applied upon a disc of glass fixed in the inside of the cover of the box, and always occupied the lower part.

The action of the solarised cardboard was continued from twelve to fifteen hours. A plate of glass—although transparent—protected the sensitised paper; but it required to be carefully cleaned: without this precaution, the sensitised paper blackens as much, or even more, under the glass than upon the parts exposed directly to the action of the solarised paper.

First Experiment.—The sensitised paper being partially covered by a plate of glass, a second was placed across the first, so that the sensitised paper was separated by a distance of 0.118 of an inch; this second plate, of 0.393 of an inch in thickness, was thus exposed to radiation but not to circulation. When the box was opened the paper was found blackened all over, except under the band of glass in contact with it. But if this first glass band is very thin, so that the distance between the second band and the sensitised paper is very small, the circulation becomes more difficult, and the subjacent paper is partially preserved. In substituting a plate of ivory for the second glass, no difference in the result is observable. This second experiment was made because it has been stated that solarised paper can act through transparent bodies, when the air is frequently renewed, as is shown by certain impressionable substances, like bitumen of Judea, being insensible to light when entirely deprived of contact with air.

Second Experiment.—The box containing the solarised cardboard was left for four hours in a warm place; it was opened cautiously, keeping the opening downwards, and the cardboard gently withdrawn: a sensitised paper, with a slip of glass across it, was promptly fixed to the bottom of the box, and the box closed. It was then put in a cool place, and when opened—after the lapse of twelve hours—the uncovered portion of the sensitised paper was found blackened, notwithstanding the absence of the solarised cardboard. It is evident from these two experiments that the effect is due to emanation and not to radiation.

The question is—What is the nature of the substance that escapes from the solarised cardboard, and acts upon the sensitised paper? The following facts prove that it is a volatile acid, very probably formic acid:—

1st. Blue litmus paper, partially covered by a plate of glass, and exposed to the action of the solarised cardboard, always reddened upon the uncovered portion. This experiment was very frequently repeated, because it could, without inconvenience, be added to all the other experiments.

2nd. In order to prove that this volatile acid was itself the active substance—for it might only accompany it—a large glass tube was enveloped in bibulous paper, moistened with a solution of potass: it was fixed at the bottom of the box inside, and occupied the whole vertical height; a solarised piece of cardboard was introduced; and after putting, as usual, on the interior of the the cover a piece of sensitised paper, and a piece of blue litmus paper, traversed by a piece of glass, the box was closed. At the expiration of twelve hours the litmus paper and the sensitised paper were not altered in appearance: in the absence of the volatile acid, neutralised by the potass, no action was manifested.

To determine accurately the nature of this acid, it was necessary to collect a notable quantity of it. Recourse was had to other means, the result of which renders the existence of formic acid very probable.

1st. Some distilled water was put into a clear porcelain capsule, and exposed for fifteen hours to the action of solarised paper. Some drops of nitrate of silver were next added, and the whole heated to boiling: the liquid speedily became black, as happens when the experiment is made with a *minimum* quantity of formic acid.

2nd. The distilled water was replaced by a solution of acetate of lead; and after being submitted to the action of the solarised cardboard for two days, there was found on the surface of the liquid a multitude of little white spots, which were removed on a piece of paper. They were then boiled with a weak solution of nitrate of silver, which was reduced to the metallic state, as if acted upon directly by formiate of lead. It might be urged that some particles of tartaric acid had fallen upon the acetate of lead from the solarised paper, and formed white spots of tartrate of lead; but to this it may be replied, that lead does not reduce the salts of silver as the formiate does.

3rd. In smelling the interior of the box at the moment of opening it, the mixed odour of caramel and formic acid may be recognised. The presence of formic acid is easily explained, when we consider the influences to which the paper impregnated with tartaric acid is submitted.

Finally, the action of light may be manifested by two opposite effects—reduction or oxidation. The direct effect is always a reduction; it manifests itself upon the salts of silver and gold, &c. To these must be added that which surpasses all the others by its energy and its consequences—the reduction of carbonic acid in the leaves of plants. But reduction supposes the separation of oxygen, or of any other electronegative element—a separation which puts it in a nascent state, and renders it peculiarly apt for uniting with the substances with which it is in contact. If the oxydised body—by its nature and properties—become more apparent and palpable in some degree than the substance reduced, the oxydation appears then solely the effect of light; but it is a secondary effect, such as may be remarked in bitumen of Judea, essence of turpentine, linseed oil, &c.; and, we may add, upon tartaric acid, if we prefer to admit that—under the influence of light—the oxygen tends to separate from the organic matter impregnated with the tartaric acid; for this oxygen, in its nascent state, unites with the tartaric acid, and produces formic acid. The affinity of tartaric acid for oxygen aids this transformation; it is only neces-

sary to add peroxide of lead to a strong solution of tartaric acid to obtain immediately an emanation of formic acid. We may avail ourselves of the property possessed by tartaric acid of readily becoming super-oxydised, and exhaling formic acid, to control the preceding effects by the following experiment:—Put into a test tube a concentrated solution of tartaric acid, and of peroxide of lead; then apply upon the cork a piece of sensitised paper and a piece of blue litmus paper, held together by a band of glass; the cork being fixed in the tube, above the solution, it is placed in the dark, and after a very short time the sensitised paper becomes brown, and the blue litmus becomes red, as if they had been exposed for twelve or fifteen hours to the action of solarised cardboard. Moreover, a new feature of resemblance is, that in either case the blue litmus papers reddened by the acid, left to themselves, gradually acquire their original blue colour.

The facts here given scarcely admit of our admitting the persistent activity of light, and still less of a stored-up light; but if the experiment of M. Nièpce, thus explained, loses its novelty, it retains the stamp of originality which characterises all the researches of its author.

Messrs. Bouillon and Sauvage had already concluded from their researches that the reduction of sensitised paper, submitted to the action of a solarised tube, was due neither to heat nor to stored-up light. The single experiment they quote in proof of their assertion may leave some doubt on the mind, as M. Nièpce had made it himself, and previously refuted the conclusions they sought to draw from it, in stating that the luminous radiations emitted by phosphorus slowly burning in the air do not act through glass. Messrs. Bouillon and Sauvage attribute the reduction of the sensitised paper to a peculiar volatile body, probably ozone; but ozone, far from being a reducing agent, is a powerful oxydizing body. Still we may attribute another—indirect and decisive part—and quite similar to that I have attributed to the oxygen separated by light, in the nascent state, from the organic matter; for ozone is only oxygen brought to, or conserved in, the nascent state, and thus susceptible of oxydising most bodies; and as almost all organic substances, as gum, sugar, starch, lignine, tartaric acid, &c., produce formic acid, with a mixture capable of oxydising them, we see the part that ozone or nascent oxygen can play—not only in this first experiment of M. Nièpce, but also whenever organic matters are exposed to light.—*Le Bulletin de la Sociétié Photographique.*

CULLINGS FROM "THE PHOTOGRAPHER"

M.S. Journal.

Mr. Taylor's Paper.

By private letter each of you by this time is made aware of the cause of the stoppage of *The Photographer's* circulation for such a long time—how that my premises were broken into, and that the dear little Journal was, among other papers, villanously kidnapped. In future I hope we shall go on as harmoniously as heretofore.

Having left Dumfries in favour of Edinburgh—where I trust I am now permanently resident—I will, if not in this, at least in subsequent papers, do what in my power lies to enlighten you as to the progress of photography in these northern regions. I may as well enter on this topic at once, by stating that we have a Photographic Society here, which adopts for its name the somewhat sonorous one of "The Photographic Society of *Scotland*;" probably because *Edinburgh* is the capital of Scotland. I wonder how our Glasgow brethren relish this title? Not very well, I suppose; for, if I mistake not, theirs was the first society—at least in a chronological point of view; but, be that as it may, *we* are now the Photographic Society of Scotland. On the inner life of this society my next paper will treat. My present will be, at least in part, devoted to giving those of you who are interested in that sort of thing, an account of a trial of landscape lenses which came off some time ago, under the auspices of this Society.

A Committee was appointed for testing and reporting on the merits of the various landscape lenses now in the market. If any of you want to see the *official* report, I must refer you to the next number of the London Journal, which is the organ of our Society, and to which I have sent it. That Committee was composed of four members, viz.—Mr. Raven, a capital waxed-paper manipulator, and one of the successful candidates for medal honours at our last examination; Mr. James Bryson, one of our most intelligent opticians; Mr. Tunny, a shrewd and skilful professional photographer, who does a roaring trade in collodion calotyping, of which he was the first practitioner in this part of her Majesty's dominions; and, lastly, myself—your very humble servant—of whom but little can be said, either "good, bad, or indifferent." Well, having got hold of all the Voigtlanders, Rosses, Goddards, Grubbs, &c., we could lay hold of, we proceeded to test them—not so much to establish the superiority of one maker over another, as to see what *class* of lens was best. We had a real tough job of it, and no mistake! The subject on which we practised was a straight row of houses (Montague-street)—in front of which, and at a distance of a few hundred feet, we planted our cameras. The first trial was with Petzval's new landscape combination, as made by various makers of eminence, both at home and abroad. Of these we got the best we could think; but, alas! when we applied the rule and compasses to the finished proofs, all were more or less deficient. Goddard's Petzval gave admirable definition all over the plate (12 × 10), leaving in this respect nothing to be desired; Ross's orthographic (we had two of them) were scarcely inferior in defining power; Voigtlander's orthoscopic gave one of those soft pictures which would have pleased Sir William Newton; but *not one of them* would give absolutely straight marginal lines—they were all curved outwards. We tested Grubb's aplanatic lens, along with another ordinary achromatic view lens of the same diameter and focus. The results were very similar, but Grubb's lens possesses the advantage of working with a large stop, which must render it a good lens for groups or instantaneous views. As was expected, neither it nor the ordinary view lens tried along with it (which was made by Ross) gave straight marginal lines; but in this case, unlike that of the Petzval family, the curvature was inward. The focal length of all the lenses tried was nearly the same, but the Grubb and Ross *meniscus lenses embraced a greater angle of view than the Petzval form.*

Despairing of ever seeing *straight* lines, we next tried one of another kind, and of which we could only procure one. It was one made by Goddard, on the principle laid down by our co-member Mr. Sutton in a recent communication to the London Journal. Well, from one or two simple experiments which I had made, after reading Mr. Sutton's paper, I thought that if Mr. Goddard had done justice to it, the "Sutton" lens was the one which must win the day—at least so far as freedom from distortion was concerned. The result proved my surmises to be correct. Of all the lenses we have tried "Sutton's triplet," as made by Goddard, was the only one which rendered the marginal lines straight. It was a pleasure to look on the proof taken by it, compared with those by the Petzval and meniscus class. All of them defined well—this *only* gave freedom from distortion.

(To be continued.)

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. IV.

I verily believe that the gloomiest spot on earth is the valley of Jehosophat in a rain-storm: and here I must be a prisoner in my tent all day long, listening to the howling of the wind rushing furiously between the Mount of Olives and the hill Moriah, as if the fiends were driving the souls of the damned through the valley—as saith Mohammedan tradition they will one day, when the Prophet shall have judged them on the Temple mound above;—and then, when all is still, solemn, silent, and calm in the valley, I can hear, far up, over the walls of the Temple, the moan of the storm, like the voice of offended Nature, solemnly declaring the vengeance of its God. The swollen stream of the Kedron rushes by yellow with clay. I am seated on a camp-stool, my canvas pinned closely down around the earth heaped over the edges to keep out the streams that come dashing down the Mount of Olives; my shivering Arabs are crouched under the canvas of the servant's tent, and ———

I was interrupted by the irruption of one of the streams I spoke of, which found its way under the edge of the tent, and threatened to carry us away, bag and baggage, but which my men successfully directed into its proper channel again, so that all is once more dry, snug, and close. A tent like mine, in such a tempest as now prevails, is not to be laughed at, let me tell you; and as photographic operations must be suspended for this day at least, I shall devote myself to writing to all friends at home who take any interest in my proceedings, and communicate to you my adventures during the past week.

I have hovered about Jerusalem in every direction, but not yet set my foot in it. I approach it with a vague awe, for I feel that, being holy ground, I must not lightly profane it. I desire to render myself worthy of the privilege of entering the sacred precincts, and

seek to subdue my thoughts and feelings to the true devotional pitch. Therefore, I shall first finish all business requirements, and when my mind is free from worldly cares, put off my shoes, and glide through the city gates, the greatest of sinners.

But every inch of ground about me is holy ground. The Mount of Olives, Bethany, the Wilderness of Engeddi, and many other places familiar to you which I need not name, have engaged my attention. I have been over the hill to Bethany half-a-dozen times already. Often in the morning, rising early, and taking my coffee hot from the hands of my faithful Hassan, I climb the Mount of Olives, and walk swiftly along the winding ridge, down to the old home of Martha and Mary and Lazarus, seeing the sun rise lovingly over it, and then return to breakfast and a day's photographing.

Bethany lies but a short walk from Jerusalem — perhaps two miles—on the eastern slope of the hills which are called the Mount of Olives. This road is the saddest and holiest walk on this earth. How often trodden by those weary feet that bore our heavy load! Morning and evening, going out and coming in to the city, He passed this way. On it He bade the fig-tree wither: on it He mounted the asses' colt, for His only triumphal march on earth. At the one extremity of it was the home of Mary and Martha and the tomb of Lazarus; at the other, the Cross and the Tomb; and somewhere along it is the dust He shook from His feet on the earth that had rejected Him as He ascended to His throne. Sad and sublime path from Jerusalem to Bethany! Above it angels hover for ever, worshipping the tears that dropped all along it from the sad eyes of the Man of Sorrows.

The old village lies in ruins. A deep dark vault on the side of the hill, into which you descend by a flight of stone steps, does duty as the tomb of Lazarus. I know no reason to doubt its correctness; some such place here he occupied, and perhaps he slept in this again after his Saviour was gone whither he followed Him. I sat down on the ground in a shady lane or road that runs down to the hill-side, in the edge of which is the tomb; and here, as a thousand travellers have done, read over again in the Bible the beautiful story of the brother of Mary and Martha.

The day wore on, noon came and past unheeded, the sun went westward, and still I lingered. Could you but have seen how sadly splendid was Jerusalem in the sight of the setting sun, as I returned to my tent over Olivet!

I set off alone the other day for the Wilderness of Engeddi and the Convent of Saint Saba. It was a delightful day for the road. All down the bed of the Kedron it was fresh and grand; wild flowers starring out on us everywhere. All over the hills of Palestine there are to be found splendid varieties of the anemone.

Following the Kedron down some ten or twelve miles to the south-east, I reached a spot where it suddenly began to descend rapidly between lofty and precipitous sides. Instead of descending with it, I found a road cut in the cliff on the south side of the ravine, along which I rode, while the stream continued to descend deeper and deeper, the gorge growing more dark, profound, and magnificent, until it became several hundred feet deep—I will not attempt to guess how many, but not less than four hundred I think it safe to say; the sides abrupt, bare rock, nearly perpendicular, the top only a gun-shot across. And now I knew I was in the Wilderness of Engeddi, which has been famed in all ages.

My mare snuffed the desert atmosphere, and tossed her head into the air with the utmost delight. The odours of the city had not been agreeable to her, and she had been stabled night after night in the vacant tomb of a wealthy Jew of the olden time, in the Valley of Tombs.

Hassan met some of his old friends as we entered the gorge. There was an Arab of the Jordan Ghor—a sheik with two or three followers — who eyed us suspiciously as we approached; for I had not seen fit to make any arrangements, or pay any tribute to his tribe for protection. Hassan recognised our present friend as a notorious camel-thief, to whom he owed somewhat — as Arabs owe debts to Arabs — in the way of revenge.

A guttural grunt, not unlike that of a North American Indian, was the only salutation as they passed each other, and when the chief came to me, lounging along a dozen rods behind Hassan, he paid no attention whatever to my "*Salaam Aleikoum*," whereby I knew him for an enemy. It mattered little, however, for one Frank is fully equal to four Bedouins, and there were no more of them, and I had two six-shot revolvers in my holsters. But it behoved me to keep a sharp look out on my way back to Jerusalem. More than once in my rambles a bullet has whistled past my ears, without my being able to discover the miscreant who fired it.

A little further on we came to a point where the left or ravine side of the road was closed up by a stout wall, extending along the ridge, descending into its depressions, and flanked by two high stone towers. This is the top of the Convent of Saint Saba, which hangs on the precipice from its summit two-thirds of the way down the ravine, and there impends over the abyss below. D· T.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER IV.

MAXIMS *(continued)*.

54. "To produce force, solidity, and strength, some part of the picture should be as light and some as dark as possible; and these two extremes must be harmonised or reconciled to each other by a proper introduction of gradatory tints and demi-tints."

55. "Truth of colouring consists, not in giving to objects their precise local colour, but in so contriving that they shall seem to have it."

56. Broken colours in the background give value to the purer colours of the flesh.

57. "Simplicity and keeping are the basis of purity and harmony."—*Fuseli.*

58. A pale subject may receive warmth, a red or brown one pallor from the colours of your background.

59. Backgrounds give excellent opportunities, not only for distributing colour to produce effects of harmony or contrast, but also in extending or concealing form, &c.

60. "Strong colour requires deep shadow to support it."—*Burnet.*

61. "Variety of tints, very nearly of the same tone, employed in the same figure, and often upon the same part, with moderation, contribute to harmony."—*De Piles.*

62. "In a single head we often have but one light; it is therefore necessary to get it to harmonise with the shadow in the background or upon the dress. Rembrandt, accordingly, frequently painted the light of the dress the same colour as the shadow side of the face, thereby keeping up a union and simplicity."—*Burnet.*

63. "Colour holds the station of middle tint. * * * * The proper situation of strong colour is neither in the high light nor in the deep shade, for it would destroy the character of either; but if it is made use of as an intermediate link, it will unite both.—*Ibid.*

64. "No object, of whatever kind it be, were it executed with the greatest perfection, will ever pass for being a 'good choice,' if, by the unskilfulness of the painter, it be placed upon a ground of one single monotonous tint."—*Francois-Xavier de Burtin.*

65. Every tint and shade should be subservient to some one general tone of colour previously determined on as most in harmony with the subject, its sentiment, or effect, as Fielding says — "In every harmonious composition of colours there is a principal tone, key, or predominant colour to which its other hues refer subordinately, as in music."

66. To prevent any appearance of the figure being "*inlaid*," Sir Joshua Reynolds says — "The ground must partake of the colour of the figure, or contain such a mixture as to exhibit in it something of every colour in the palette."

67. "When a form is beautiful, it ought to be shown distinctly; but when, on the contrary, it is uncouth in shape or hue, it may be lost in the background. Sometimes a light is introduced, to join and extend the light on the figure, and the dark side of the figure is lost in a still darker background; for the fewer the outlines which cut against the ground, the richer will be the effect; as the contrary produces what is called the *dry manner*."—*Sir J. Reynolds.*

68. "By mellowing skill thy ground at distance cast,
Free as the air, and transient as its blast;
There all thy liquid colours sweetly blend,
There all the treasures of thy palette bend,
And every form retiring to that ground
Of hue congenial to itself compound."—*Fresnoy.*

69. If objects are introduced into the background they should be few in number, and should be kept subservient to the figure. Landscape backgrounds should consist of broad features and few details, and should be kept low in tone. The introduction of a few warm tints into the sky near the horizon serves to repeat the colour of the flesh. The horizontal line should not be placed too low."—*Mrs. Merrifield.*

70. Distance is obtained by diminishing the intensity of *colours.*

71. Powerful contrasts should be avoided in parts requiring *quiet* and retiring qualities.

72. "There may be the most perfect combination of beautiful colouring, which, if inappropriately applied, would not only fail to

produce a pleasing effect, but would destroy the whole harmony or truthfulness of the picture.—*Wyke Bayliss.*

73. "It is the background which forms *the picture*, and its use is *not merely to throw out the principal object*, but by its tone and colour to control and harmonise the whole."—*C. W. Day.*

74. "When the flesh colour of your sitter is a very bad one, you will find that a background of dull green will give it its full value—that is, it will, by contrast, show the reds to the best advantage."* —*Ibid.*

75. "A good background never obstrudes itself on the eye or observation, but in all cases is subservient to the effect of the portrait or figures; therefore a background should be simple, broad, and in all cases partaking of an atmospheric tone, neutral and retiring, but not cold."—*J. S. Templeton.*

ON DRAPERY.

Graceful lines, harmonious colouring, contrast and relief, may be helped materially by your treatment of drapery—with, however, especial reference to the colour and character of your flesh.

Folds in the photograph are—by mere chance, perhaps—very frequently too numerous for breadth of effect, or too ungraceful; judicious alterations are therefore permissible.

These precepts may be looked upon as so many direction posts, put up by great travellers who have passed over the tract you are about to trace; and have thereby reached the goal you, I presume, are anxious to attain. Their use will be appreciated best by those who, having taken wrong roads, have recovered the direct path by their aid, and least by those who would rather trust to their own inexperience (or ignorance) than *condescend, or take the trouble* to receive tuition from another's wisdom. It were very little use to supply the means of travelling if there were no roads, and roads themselves may confuse and delay if they are not provided with *direction posts.* Just so with these articles on colouring: it were but little service to my readers if I told them how to use brushes, or mix and apply colours, if I left them ignorant of such principles as develop the end and aim of all true art, viz.—*the perfect representation of nature.*

The simplest and easiest style of colouring is that applied to glass positives and daguerreotypes. To this, therefore, I shall first direct attention in the next chapter.

* Or (of course) where the flesh of your picture is coloured badly, this background will also assist you.

Letters to a Young Photographer.

No. XVIII.

MY DEAR EUSEBIUS,

I shall bid adieu to processes for awhile, quit the mechanical and take up the poetical side of our art: enter the domain of æsthetics and endeavour to initiate you into the occult doctrines of the Beautiful. I shall not add to the melancholy list of limping philosophers who, from Plato downwards, have essayed to define Beauty; let it suffice to you that it is indefinable. Doubtless most of us feel it, and if we do let us be thankful, and not profane the feeling by seeking to clothe it in words. But the faculty of perceiving the Beautiful in Nature and in Art is not enjoyed by every one, least of all by many who call themselves artists; they are mostly slaves of convention, which in their blindness they think is Art, worshipping a false idol for the true divinity—heathens who abandon the goddess Nature for their golden calf—Art.

The faculty for Art—the perception of the Beautiful—the "play or sportive impulse" appears to be a sixth sense, possessing a bump or organ of its own, not mapped down by phrenologists. Perhaps it has no external organ like the eye or ear, hence the difficulty of demonstrating it. Concealed *within* the brain it is invisible; but from its mysterious retreat it governs the other five senses, and renders them subservient to its purpose. With our eyes we see, with our ears we hear, with our nose we smell. But what is it we see, hear, and smell? To the brute creation also the leaf is green, the sky resplendent, the flower fragrant: they derive these perceptions through their five senses, but nothing beyond, for want of the sixth.

In man alone this sixth sense is found. The rudiment or germ of it is doubtless in every human being; only in some it is developed, while in others it for ever remains dormant, abortive, or perverted.

Unfortunately no name has been bestowed upon this art-faculty. By some it is styled "poetic temperament." Of a certain person it is said—"He has a poetic mind, or a poetic nature," while those prosy persons who study to be facetious, call it "the bump or organ of the Fine Arts."

Now in those who possess this organ, whatever it be, there is a something which is responsive to what we regard as the Beautiful, which was so keenly felt and enjoyed by the ancient Greeks. It is akin to what is called an ear for music, an eye for colour. For it is well known that many persons cannot distinguish one tune or one colour from another, yet they do not appear to be deficient in any organ. They have eyes, but see not; they have ears, but hear not. What then does this sixth sense see or feel? It sees, it hears, it tastes, it feels, it smells, in a word, it combines the functions of the other five, but only in an ideal world, wherein the other five do not, cannot enter. From the leaf, the flower, the sky, the stream, it enjoys a charm which belongs neither to blue nor to green, nor to brilliancy, a charm of which these perceptions are the occasion, but not the object which excites and stimulates them, but which cannot of themselves produce it. We may assert that this charm exists, but how can we depict it? When we endeavour to reach it it fades away; when we endeavour to seize upon it, it eludes our grasp; when we endeavour to fix it, it disappears.

This charm consists in feeling in the leaf something of its lightness, its decay, its ephemeral existence; it is to dream, in connection with it, of the rapid flight of time and of the sad metamorphoses effected by it. It is to recognise that our destiny is the sport of external things, as the leaf is the sport of the winds. It is to feel in the stream something of the peaceful and the lovely; a pure reflection of the sky, or a mysterious retreat, variable as the clouds above it, leading the mind either to a melancholy that gently affects it, or to a calmer joy that soothes and refreshes it. In a word, it is the "faculty divine" of the poet.

Whatever it be, this organ is the progenitor of the Fine Arts, acting through man's impulse to reproduction; exciting the creative instinct. It is this creative power that renders the pursuit of Art so fascinating. If the features of a landscape, its rocks, trees, clouds, and their reflection on the bosom of a calm lake, strike this sixth sense, so as to excite the charm I have spoken of, we are immediately seised with a desire to reproduce this image.

This desire proceeds from imitation, being a pleasure natural to man which delights to see the resemblance of something grow beneath his hands. But yet it is more than this, for with man, to imitate is to create; it is the gratification of our self-love that allures us; it is an exercise of power that exalts us; it is the noblest exercise of our faculties.

Again, this peculiar sense is also necessary to enable persons to enjoy the productions of art—the master-pieces of the great artists of bygone times. This poetry of the mind, which in the fine arts applies itself more particularly to the work of imitation, may, independently of all imitation, be extended to everything, and embrace whatever the human mind can conceive. There is poetry in the history of the past—a poetry that hovers and soars around and above the facts of which it is composed. There is poetry in man's life, in the play of his passions, in his vicissitudes, in his mysterious destiny, in virtue, in sorrow, and even in crime. Above these things, considered as facts of human existence, there is a pure and calm region to which our thoughts retire, to enjoy the emotions they give rise to, and of which these facts are to the soul what the leaf is to the eyes, the occasion rather than the object.

From poetry proceeds noble thoughts, generous impulses of the heart. In the Arts it loves the beautiful, it seeks it and reproduces it. To every vivid feeling is allied the desire of expressing it, of representing it to one's self and to others. To enjoy the beauties of nature alone is only to half enjoy them. We must utter what we feel, either by pen or pencil.

It is useless for him who has not this organ to devote himself to the Fine Arts. The mechanical operations of art, such as lithography, pattern designing, poohnah painting, and similar toys may properly exercise the talent of such an one. But on the other hand, to any one who possesses this faculty in ever so small a degree, the study of the Fine Arts is commendable. After passing over the first steps an unlimited field of pleasure is opened to him.

Photographic Glossary.

Sel d'or (Salt of Gold)—A compound salt consisting of a double hyposulphite of gold and sodium, used for fixing daguerreotype images and for toning positive proofs on paper. It is prepared by dissolving sixteen grains of neutral chloride of gold and sodium in a pint of water, and forty-eight grains of hyposulphite of soda in another pint of water, and then pouring the solution of gold into the hypo, stirring meanwhile.

Serum — The whey of milk, which, when the milk is curdled by acids, separates from the cheesy portion. Serum of milk consists of water holding in solution a peculiar saccharine substance called lactine or sugar of milk, together with certain salts, phosphates, and chlorides. Serum is employed in preparing paper for the calotype.

Silver — A well known metal of considerable importance in photography, in its combinations with chlorine, iodine, and nitric acid, forming chloride, iodide, and nitrate of silver.

Soda — The oxide of the metal sodium. Its properties are very similar to those of potash, and it is a substance of equal importance in the arts. The solid *hydrate* (caustic potash), is a white fusible substance, deliquescent, and highly alkaline. The salts of soda are of considerable importance in photography, particularly the carbonate, phosphate, and hyposulphite.

Solarisation — The destructive effect of over-exposing a photographic preparation to the action of the sun's rays.

Solution — The dissolving a solid body in a liquid, as water, alcohol, &c. Bodies are brought to the liquid state by the action of heat, &c., but do not form solutions, for which a solvent is required.

Specific Gravity — The density of a body with reference to its bulk. Thus, a cubic inch of water weighs 252·5 grains, while a cubic inch of lead weighs 2865·8 grains, therefore lead is 11·35 times heavier than water. For convenience of comparison, water is taken as the standard, and is represented by 1·000, therefore the specific gravity of lead is 11·350.

Spectrum — The solar spectrum is the coloured image of the sun, produced by the passage of its rays through a prism. The white light of the sun is decomposed into three primary and several secondary colours, which succeed each other in the following order:—red, *orange*, yellow, *green*, blue, *indigo*, *violet*, &c., the colours indicated in italics being compounds of the primaries.

Starch — Called also amidine, farina, fecula; is a component part of the grain of wheat and other cereals. It is white, tasteless, and inodorous, appearing under the form of a soft homogeneous powder, which, under the microscope, appears granular. Starch is insoluble in cold water, but forms a gelatinous mass with boiling water upon cooling, forming a very useful paste for mounting photographs with.

Stereoscope — An optical instrument invented by Professor Wheatstone, by the aid of which two plane images are seen as one in relief. It usually consists, as now made, of a rectangular, truncated, pyramidal box, with an aperture in one side to admit light to illuminate the pictures placed in the interior. Two small lenses are mounted on its summit, through which the pictures are viewed simultaneously, and are seen as one object in relief.

New Books.

The A B C of Photography, eleventh edition, with additions, including recent improvements in the art.

THE LONDON STEREOSCOPIC COMPANY, 54, Cheapside, and SIMPKIN, MARSHALL, & Co., Stationers' Hall Court.

THIS being but a new edition, does not call for any extended remarks; but we may state that it seems well calculated to carry out its professed object—that of instructing the novice how to take presentable pictures without first compelling him to learn the theoretical part of the subject. No pretensions are made to any profound scientific explanations—and, in fact, they would be out of place in so elementary a work—but with each division of the subject there is a section devoted to failures, their causes and remedies.

It is particularly adapted to those knowing nothing at all of photography, and wanting a slight insight into its mysteries.

Foreign Correspondence.

Paris, August 25, 1859.

ONE of the greatest triumphs of photographic art yet achieved is the publication of the works of Paul Delaroche, executed by Mr. Bingham, edited by M. Jules Goddé, and published by Messrs. Goupil & Co. The entire series consists of no less than eighty-six different subjects, and is published in twenty-two numbers, at twenty-five francs each, the total cost of the work being twenty pounds sterling. The pictures of M. Delaroche are mostly historical subjects, many of them being taken from English history. Among the most popular are "The Death of Queen Elizabeth," "The Princes in the Tower," "The Execution of Lady Jane Grey," "Stafford going to Execution," "Cromwell Contemplating the Corpse of Charles I." These works have tended to make Delaroche more popular in England than any other French artist. A biography of the painter, by Henri Delaroche, and a catalogue *raissonné* of his works, by M. Goddé, render this publication as complete as can be desired.

At the last meeting of our Photographic Society, M. Civiale made a communication on the diminution of time of exposure for waxed-paper, and dry collodion, and albumen. He was led to make his experiments by remarking the rapidity moist paper acquires from the presence of free nitrate of silver on the surface, and he has endeavoured to put waxed-paper (after exposure) nearly in the same conditions as wet paper, and also dry collodion and albumen in the same conditions as wet.

The sensitised paper being properly washed and dried, the time of exposure with a landscape lens (Chevalier) with small diaphragm, for a plate twelve by ten inches, is from two to four minutes and a half. This result is obtained by plunging the proof, after its exposure to light, into the sensitising bath of aceto-nitrate of silver. When the sheet is entirely covered by the liquid, at the end of about ten seconds, it is removed with pincers to the gallic acid bath—

Distilled water........................ 7 ounces,
Gallic acid.................. .... 10 grains.

Without the usual addition of water used for washing the nitrate off.

Dry waxed-paper thus treated has all the advantages and inconveniences of wet paper: a greater rapidity, added to a little more hardness and instability in the results, especially in bad weather. It is necessary to take very great precautions to avoid spots; the dishes must be perfectly clean, the paper carefully selected, and recently iodised. At present good negatives have only been obtained with paper sensitised within two days, and to avoid the mottled appearance it is best to operate with paper sensitised the same day.

Perhaps it may be advantageous to increase the proportion of acetic acid in the aceto-nitrate bath, and also to modify it a little.

It requires about forty or fifty seconds in the shade to take a portrait, on a plate twelve by ten inches, upon dry waxed-paper. The time of exposure with landscape lens, plate eight by six inches, varies from one minute to two and a half.

As to dry collodion and albumen, in rendering their surfaces moist (after exposure) by means of the sensitising bath, we arrive nearly, if not altogether, at the rapidity of wet collodion and albumen.

Perhaps there is nothing new in this suggestion, but as I do not observe that it is practised, I may say with the Parisian milliners—"there is nothing so new as that which is forgotten."

The Abbé Laborde has been testing M. Nièpce's experiments on "bottled light:" the conclusions at which he arrives are, that the existence of "persistent activity of light," and "stored-up light" cannot be substantiated.

I must commend to your attention M. Monckhoven's paper on *Pyroxyline*, as containing some important facts on the mode of preparing gun-cotton for collodion. As it is the production of an eminently practical photographer and skilful chemist, it differs essentially from the crude suggestions with which our journals abound. In his sketch of the rise and progress of collodion, he shows that M. Le Gray was the first to suggest gun-cotton in 1850, in the following passage of his *Treatise on Photography*—"I have discovered a process of photography on glass, by hydrofluoric ether and fluoride of potassium, dissolved in alcohol of forty degrees, mixed with sulphuric ether, and saturated with collodion; I then sensitise with aceto-nitrate of silver, and thus obtain pictures in the camera in five seconds in the shade; the picture is developed with a weak solution of sulphate of iron." The same year Messrs. Fry and Archer published a method of photography on collodion, which is the same as that practised at the present day, and they are justly regarded as the inventors of the process. In fact, it was impossible to employ M. Le Gray's formula, because the fluorides do not yield images, and hydrofluoric ether is a substance which cannot be said to exist. Even if M. Le Gray's mention of collodion served as the hint upon which Messrs. Fry and Archer acted, the latter have none the less merited the claim of originality in proposing a really practicable formula.

M. Poitevin, who has so stoutly contended for the "De Luynes' Prize," has presented to the Photographic Society a proof taken by him direct with typographic ink on paper, in July, 1855, and one of a series of photographic proofs taken at different epochs of the application of the process, to the perfecting of which that artist is so zealously devoted. He also exhibited proofs obtained by his gallate of iron process.

Messrs. Davanne and Girard are steadily pursuing their experimental researches on the philosophy of positive printing, which will yet require some months for completion. They fully expect to attain the object they proposed to themselves in the commencement—that of permanency and certainty in photographic printing.

Messrs. Salmon and Garnier presented a memoir upon their carbon printing process upon paper, stone, and metal, with specimens.

M. Nièpce de St. Victor is still pursuing his experiments upon the chemical changes effected by light on starch and other organic bodies. For example, starch suspended in water to which a small quantity of a metallic salt is added, and exposed for a given time to the sun's rays, is converted—first into dextrine, and then into grape sugar. M. Nièpce is convinced that in one of his experiments he obtained true cane sugar. If this statement is confirmed it will constitute one of the greatest discoveries of the age. The experiments were made in glass flasks, and the presence of the sugar was proved, not only by the aid of the ordinary tests, but also by employing the saccharometer to test its optical properties, by which it can be readily ascertained whether cane sugar or grape sugar is present. In some instances the organic matter acted upon by the metallic salt under the influence of light, appeared to be converted into a new substance, which did not exhibit to the usual tests the peculiar reactions of starch, dextrine, or sugar. It is also supposed, though not yet proved, that under certain conditions grape sugar may be converted by the agency of light into oxalic acid. J. P.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

AN AMATEUR'S DIFFICULTIES.

To the Editor.

Sir,—There are so many questions asked of you, that perhaps I may be excused for adding one or two to the number.

1. Do you know of a developing solution for positives that will keep for a length of time? I was shown some by a dealer in photographic goods, which he said would keep, so that a quantity might be made at one time, which seems to me a great advantage. It was highly coloured, something like pernitrate of iron.

2. I have tried the formula for obtaining pure whites, but when I poured the varnish on the white tone was considerably impaired. I am not prepared to say that the deterioration in tone was owing to the sulphuric acid which the developer contains, but it appears to me that it arose from the varnish supplying organic matter to the silver in the collodion film, thereby forming an organic compound of silver. For obtaining pure whites, nitric acid seems to me to be superior to anything that I am aware of. I have now been practising a short time, using nothing but nitric acid, both in the bath and developer, and I certainly have produced more brilliant pictures than I ever did before. The bath was nearly neutral, and seemed to have a tendency to become alkaline, producing foggy pictures. Although I say that the pictures were brilliant, yet I think there was a flatness about them—an absence of relief, which does not happen when acetic acid forms an ingredient in the bath and developer.

As far as I have observed, the fogging produced from an alkaline bath is very different from fogging from other causes, and can be easily distinguished. Fogging does not appear to me a proper term for it; for instead of "veiling" the picture like a mist, it lay in patches as if some dirty solution had been bespattered against it, and it appears to be the worst at the top of the plate, as it had been exposed in the dark slide.

Being a constant subscriber to your valuable Journal, I should take it as a great favour if you would offer a few remarks on the above.

I have been much interested with the "Letters to a Young Photographer," though I entirely failed with the "cheap John" method of toning. It seems to me, though I wish to say it modestly, to be "a penny wise and pound foolish" method, of which you, I believe, share the same opinion.—I am, yours, &c.

A WOULD-BE PHOTOGRAPHER.

Wakefield, Aug. 20th, 1859.

[1. No iron developing solution will keep for any length of time without deterioration, especially in hot weather. You will find an easily-made and economical one in a paper of Mr. Mayall's, published in one of our Spring numbers.

2. There is a vagueness in your description: "the varnish," what kind? However, any varnish degrades the brilliancy to some extent. The best mode of proceeding is, in our opinion, to pour on the positive picture, *after* its final washing, some dilute albumen (say white of egg one part, water seven parts), drain and dry. When dry, dip into your iron solution to coagulate the albumen, and again wash and dry. We do not think the cause assigned by you as conducing to the degradation of tone the correct one, but that it is rather due to an interference with the reflecting surfaces of the molecules of silver. The brilliancy obtained by nitric acid is apt to be deficient in half-tone from the particles of reduced silver being much larger than when a less energetic oxidising agent is employed, the metallic glare is also liable to be offensive. An alkaline bath generally produces fogging, properly so called; what you describe is rather due to organic matter in excess.—Ed.]

A GOOD IDEA.

To the Editor.

Sir,—In the present dearth of photographic news, the following incident may be interesting.

While taking a picture in Highgate Cemetery a short time since, a man who was digging a grave close by laid down his spade and came to watch proceedings. On his making some inquiries, and showing some knowledge of the art, I ascertained that he and a mate of his, instead of spending their money in beershops, saved it up, bought a set of apparatus, and fitted up one of the catacombs for a dark room. Whenever a monument of any importance is erected, they photograph it when work is over, and take the copy to the owner of the original, whose address is of course ascertainable, and in nine cases out of ten they obtain five shillings or so for their work, thus making a nice addition to their weekly receipts.

A CORRESPONDENT.

COLLODIO-ALBUMEN.

To the Editor.

Sir,—As I have been a reader of your Journal for years, and have never before asked a favour, I shall be very glad of a little of your kind information, especially if it appear in your next.—I am, yours, &c.

M. C. C.

1. Will it signify if I strengthen my collodio-albumen silver bath with *crystallised* nitrate of silver, the bath having been made with *fused* nitrate?

2. What are the appearances of a plate prepared as above by the collodio-albumen process when too much iodide of ammonium has been added, and what when too little?

3. What will be the result if too much glacial acetic acid has been added to the silver bath? I use the same for collodion and albumen.

4. Plates which have been prepared three weeks or so, generally turn of a coffee colour after being about half developed. Is there any remedy, and what?

5. I get some beautiful negatives of near objects, such as doorways, &c., but when I go further back to take a tower, or *a large sized object*, say one hundred yards off, I often get a very indistinct picture, *focussing as fine as possible*. I think it is owing to a too bright sky, though my back is to the sun. Your opinion.

6. I have some negatives, fetched many miles *(stereo)*, which look every thing I wish, but thin, both sky and subject, taken in very dull weather, looks reddish; fixed in hypo. Can I now strengthen them by another development? Would they have been better had I used more nitrate of silver in developing, or is my bath too weak?

7. Do you think it best to develop as far as until all detail is visible before adding silver to the developer, or use it with first dose at commencement?

[We presume that the whole of the preceding queries apply to the collodio-albumen process.

1. No objection.

2. Rather indefinitely put. Too much iodide in the bath, the collodion, or the albumen. If the bath be super-saturated, a reduction of temperature would cause multitudes of spots. If in the collodion, the excited film would be very dense and creamy in appearance, and parts might come off in flakes. If in the albumen, it is apt to form small crystals in drying.

3. It would render the film slow to receive the impression in the camera, and when obtained would probably be weak.

4. When you say *prepared* three weeks, do you mean *excited* three weeks? If so, it may arise from insufficient washing after the sensitising bath, or from some slight exposure to light. Remedy—Wash very thoroughly, and in developing use more silver solution.

5. You probably use too large an aperture to your lens; put in a diaphragm with an aperture only half the diameter you now employ.

6. The weakness may be from over-exposure, or from too much free acid, and too little silver when developing. You may be able to intensify even now by redevelopment.

7. Decidedly add the silver at once to your developing solution, unless your negatives have been much over-exposed.—Ed.]

CAPABILITIES OF PROFESSOR PETZVAL'S LENS.

To the Editor.

Sir,—I have read the description of Mr. Rejlander's picture, *The Wayfarer*, in your Journal, and I perfectly agree with your opinion. Since that time I have received from Mr. Rejlander the companion to this picture, 14 × 12 inches, a female figure sitting, surrounded with domestic furniture, having some needlework in hand, but occupied with some meditation. Most probably you too will also receive a copy of this picture. I consider it still superior in comparison with the first. But you yourself are certainly the best judge.

My object in addressing you, is to state that both pictures are taken by the original Petzval lens (3 inch diam.), and I think they are almost the first specimens of an application of this lens for a kind of portraiture.

I will certainly not diminish the due merits of Mr. Rejlander; on the contrary, I will join with great pleasure in the compliments due to him for the attention, skill, and artistic feeling demonstrated in this picture. But I think it would be only reasonable to mention anywhere to the public the fact, that they have been taken by this lens. Professor Petzval has been so abused for his hard labour, and his instruments have been run down in such an ugly manner, other colours put on the truth, that I could only consider it justice to mention the above stated fact.

I am, yours, &c. PAUL PRETSCH.

162, *Great Portland Street, W.*

VARNISH.—DRY COLLODION.

To the Editor.

Sir,—I should feel much obliged if you would enlighten me upon the following points:—

1st. I tried to make some transparent varnish after the recipe given in your number of the 1st June, in the letter to "Eusebius," but could not succeed. I broke the lac into small pieces and pounded it in a mortar, and afterwards dried it in an oven, but it would not dissolve in the alcohol; it was white lac in sticks, such as the small piece enclosed.

2nd. In the formula for Mr. Maxwell Lyte's toning bath, it is said that the portion used must not be returned to the stock bottle. Can it then only be used once? If so, it must be rather expensive.

3rd. Dr. Norris's plates are spoken of in the Dry Collodion Company's advertisements as *patent.* Does this preclude amateurs from preparing them for themselves?

4th. Where can I obtain a good description of Dr. Norris's process?

Hoping that you will excuse the trouble I am causing you,

I am, yours, &c., Z.

Liverpool, August 23, 1859.

[1. It may require the aid of heat to dissolve the lac, and perhaps your alcohol is too weak. Take the cork out of the bottle, and tie over the neck a piece of wetted bladder, and set the bottle in the sunshine, or in a warm place for a few days; or place the bottle in warm water for a few hours, shaking occasionally.

2. It can only be used once; but it is not expensive, inasmuch as if the number of prints to be toned be small, you may take a sufficient quantity of the normal bath to do the work, and *expand its bulk* by the addition of water sufficient to allow of easy manipulation.

3. Amateurs may make their own dry plates, and use them too.

4. In our last volume.—Ed.]

WOODWARD'S SOLAR CAMERA.

To the Editor.

Sir,—My attention has been called to a letter from Mr. Atkinson in your last number, having appended to it a note from yourself, referring to back numbers of the *Journal of the Photographic Society* as containing a description of apparatus for enlarging small positives.

You state in the note appended to Mr. Atkinson's letter that you see nothing new in the solar camera, much less ground for a patent, and refer to the process of Mr. Wenham, and also your own, as published in certain back numbers of the above journal.

Now, I am perfectly familiar with your process as published, also that of Mr. Wenham, and respectfully beg leave to say that neither of them bear any resemblance to the solar camera.

As I am about to leave England for my home, I have written this in order that the impression created by your remarks already alluded to may be removed.

I would beg you to call on Mr. Kilburn, or some one having a solar camera, and examine it while exposed to the rays of the sun. If you do this, I feel satisfied that you will take pleasure not only in making the correction I desire, but in advocating the use of the solar camera throughout England.—I am, yours, &c. D. A. WOODWARD.

Liverpool, August 26, 1859.

[We have within the last few days paid a visit to Mr. Kilburn's studio and seen the solar camera in operation, as also some of its results. We regret that we have to affirm our former statement—the results are not any better than those produced several years back by Mr. Wenham, nor does the solar camera involve any novelty of principle whatever. We shall probably have something to say upon the subject in a future number. —Ed.]

ANSWERS TO CORRESPONDENTS.

G. Jones (Guildford)—We have forwarded the packages as requested.

J. F. White.—We have nothing *new* ready, and no time to prepare anything just now, being *very* busy.

W. E. J., Back Creek, Amherst, Victoria.—A parcel containing what you wished for has been despatched. There is now no agent in this country that we know of for the Journal you name.

Inexperience.—5, 4, 3 are the only *first*-class makers; we prefer them in the order named. 8 is not a maker at all; the remainder are much on a level, but *a long way* below the others for the *kind* you name.

A Bewildered One.—You are not singular. Read the article on "Experiments in Parallel Directions," in the present number, and take comfort from our still greater misfortune.

J. R.—The quarter plate portrait combination you have used is of *too long focus*, a smaller lens will produce a larger image as you require it. Your letter has arrived too late for an extended reply this time; as we have several matters in type that must wait for our next.

Laura and Jane M.—That "annoying Charles" must certainly be extinguished. Take wood naphtha and dissolve in it as much shellac as will bring it to the consistence of treacle. If you put into a bottle shellac, so as not quite to fill it a quarter of the way up, then fill with the pyroxylic spirit, it will about be the thing. Or the cement, known as *liquid glue*, purchaseable at from threepence to sixpence per bottle, will answer the same purpose.

A. K. S.—To transfer positives to japanned leather, add three drops of nitric acid to one ounce of alcohol. Pour a sufficiency of the above on to the collodion and off again, then, while still damp, press the leather in close contact, taking care to remove all air bubbles; when dry the whole can be removed from the glass. Black varnished paper may be treated in the same way. The lenses you name are as far superior to that you speak of already possessing as gold is to silver; there is no comparison between them.

T. Markham, R. C., and Albumen—You had better try Mr. Sanford, of Red Lion Square, London. We believe he undertakes to prepare paper by any formula with which his customers please to furnish him:—of course at an extra charge if only a small quantity be required, owing to the impossibility of avoiding some waste of material; but probably if you require much it might answer his purpose without extra charge. We cannot undertake to make any such inquiries—you can do so at the cost of postage.

Φωτο.—We are not so arbitrary as *The Times*, nor is there any necessity for such precaution with us. Your mishap is a very trifling one. Filter the bath, and the reduced silver which will be left on the filter paper needs only washing to render it fit for being dissolved in nitric acid; the remainder of the bath will be fit for use after being rendered neutral, or nearly so, by the addition of a little carbonate of soda in solution. It will probably be a little acid from there being most likely some free acid in the developing solution added.

Robert Dart.—The explanation is simple enough; it is low-priced articles that dealers prefer to sell, as they can get a higher rate of profit on them and the demand is mostly in favour of the cheap, which commands a ready sale. The reply given is all nonsense. What you wrote for is for the best; you can *certainly* obtain it at Murray & Heath's, Piccadilly; Burfield & Rouch's, in the Strand; or at Knight & Co.'s, Foster Lane, Cheapside, and also at Brown's Medical Glass Warehouse, Farringdon Street, City. They are *not* cheap, but unquestionably good.

Querist.—1. Add half a grain of bromide of cadmium to each ounce of your collodion as now in use.—2. We do not advise an iron developer in *hot* weather; but, if used at all, say proto-sulphate of iron ten grains, water six drachms, Beaufoy's acetic acid two drachms.—3. We know nothing about the commercial aspect of photography; but perhaps Mr. Gladwell, Gracechurch Street, or Mr. Nottage, Cheapside, may assist you. —4. The index will be published at the conclusion of the volume, which is completed at the close of each year.—5. After six p.m. on most days, Thursdays being least certain.

T. Parkhouse.—You will find our report on Derogy's lenses in a recent number, from which, if you refer, you will perceive that Mr. Lloyd Chapman, in his advertisement, does not quote quite fairly. We did *not* state that they are "equal to six ordinary lenses," but that the labour of *testing one* of these was as great as that of trying six ordinary lenses. These lenses are good, and certainly very cheap; it is therefore to be regretted that any exaggerated statement should be made about them, a proceeding sure to bring them into discredit. We perceive, by the way, that the conductor of a contemporary publication has mistaken the application of the supplementary lenses when employed for landscape purposes. They should be attached in contact with, and in place of the diaphragm, the front of the portrait combination being removed to the back of the tube in all cases when employed for taking views, except when three pairs of lenses are in use at once.

*** Among several articles in type which are left over till our next, are Notices of Recently-published Stereographs and the Letter of our Australian Correspondent.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

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THE PHOTOGRAPHIC JOURNAL.

No. 102, Vol. VI.—SEPTEMBER 15, 1859.

In our last we had occasion to make some remarks in connection with a paper by * * * M.D., published in that number, and one by the same contributor previously given, but we may repeat here our conviction that there is, in our opinion, *no ground whatever* for the charge of plagiarism which has been brought against the author, whose name we are now permitted to disclose, as will be seen by a letter we publish amongst our correspondence, signed R. L. Maddox. Moreover, we consider the process last given by Dr. Maddox as one calculated to play an important part in photography, and regret that the pressing nature of other engagements precludes the possibility of our personally working at it at present. We trust however that we have been able to enlist the services of a very able amateur to test its value, in addition to those of its author.

We believe the original idea of employing albumenised paper as the basis for a negative is due to Mr. Mayall, it having been suggested by him in the very first year of the existence of the Photographic Society, but whether he ever carried it out into practice we are not aware. The superior keeping quality of waxed over simple calotype paper after excitation is an important consideration in the employment of the former, particularly as eventually the operation of waxing must be performed with both; and the persistence of the actinic impression, subsequent to the removal of the iodide of silver, when albumen has been used in conjunction with the silver salt, is a good reason for including this feature in negative processes if practicable. The very simple and efficient method of rendering the paper transparent, adopted by Dr. Maddox as a substitute for waxing, is another very troublesome obstacle removed; and, finally, the results obtained by this operator demonstrate clearly that the anticipatory calculations have been well designed. It is true that there are still some little difficulties of manipulation to be overcome before we may regard the process as perfect, but these are not such as to offer any great amount of apprehension about their removal.

The attempt to apply the albumen with the waxing and iodising solutions at one operation does not appear to have worked very satisfactorily, but we do not regard this as of any great moment, though it would have possibly been a convenience if practicable. It appears also that some difficulty exists with regard to floating the albumenised paper upon the sensitising bath, in consequence of its having a tendency to curl up very obstinately when wetted on one side only. It will therefore be preferable to immerse the sheet entirely; and though this would be objectionable to some extent with *un*albumenised paper, in consequence of its conducing to a development of the image in the fabric of the paper itself, rather than on its surface, thus giving rise to a want of distinctness of detail, yet with albumenised paper we scarcely imagine that the same effect would occur except in the high lights of the picture, where it would be of advantage, while the delicate shadows and semitones would, we have reason to believe, be confined strictly to the albumen, and consequently to the surface—a point of vital importance in determining the brilliancy of the resulting positive.

We find that difficulty also has been experienced in evenly coating the paper with albumen, and as we have had complaints from several correspondents relative to their inability to procure albumenised paper prepared by any formula except that adopted by the dealers, we may probably in our next, or in an early number, touch on the subject of preparing it.

We presume that the season for active photographic operations in the field may now be considered as past the meridian, although probably the majority of amateurs do not get their artillery into full play until thus near to the close of the engagement. We have, during the past twelve months, had so many contrivances brought to bear for working wet collodion out of doors, in the shape of tents, barrows, boxes, carriages, perambulators, *et hoc genus omne*, that it would be an interesting inquiry to ascertain at the close of the season what amount of spoil has been acquired by each contrivance. As a matter of course each individual inventor would sing the praises of his own particular progeny; and with perfect good faith, too, for had he not thought it the best he would naturally have adopted some other one. It is, however, not a little amusing to observe how enthusiasm will sometimes run away with a photographer who rides his hobby very hard. We remember not very long ago reading a letter published in the pages of a contemporary, in which the writer recommended the use of a bag for changing his plates, into which he also put his head while performing the operation, and wound up his communication by stating, "that he was sure any one who tried it would be certain to like it."

Now, joking apart, we have no doubt that the writer of the above-named letter really did enjoy the operation—not *per se*, of course, but for the results he obtained thereby; and there is something very genuine in the earnestness displayed in the pursuit, and the eagerness shown to communicate a portion of his pleasure to others.

Again, the numerous variations of the dry processes will probably this year stand a fair chance of being accurately compared one with another under almost every conceivable variety of circumstances. It is to be borne in mind, however, that every photographer, even if he be an able manipulator, is not necessarily qualified to observe comparatively, excepting so far as he himself is concerned; therefore, in all the reports that may hereafter be published, it will be well to note very particularly the personal habits of the operator so far as they bear upon the subject. The fact is, that very many of the conflicting statements that appear are due, not so much to the real merits of the respective processes, as to the idiosyncrasy of the operator.

We notice in a French journal devoted to photography, *La Revue Photographique*, two letters, signed respectively "H. Collard" and "A Subscriber," complaining of want of success in attempting to repeat the experiment of development in ordinary light, as indicated by Mr. Young, of Manchester. One of the two correspondents denominates it Mr. Young's process, and inquires in what consists the benefit, seeing that the number of operations is not lessened?

The letters of these gentlemen both explain the cause of the respective writers' failures, inasmuch as each one employed a simple film of collodion, instead of one *albumenised*, as was expressly intimated as necessary to success by Mr. Young, who

also mentioned the fact that collodion alone did not appear to possess the same property. It is doubtless owing to the fact of their want of access to the original document that the experimentalists committed the mistake.

In reply to the question asked, we would first of all remark that Mr. Young did not put it forth as a new *process*, but simply communicated the fact as a singular phenomenon that he had observed, and which he considered (very correctly) as one worthy of being recorded, being assured that no scientific *fact* can by any possibility be regarded as insignificant, as the time will surely arrive when each will be utilitised. With regard to that one under consideration, there are photographers who can employ it with advantage even now, as, for instance, in developing a dry plate when away from home, when it would be extremely difficult to *improvise* a dark room; for it must be borne in mind that in order to develop a negative properly it requires inspection during the operation, while to merely dissolve out the iodide of silver, commonly called fixing, the affair can be managed just as well without seeing it as when under observation the whole time.

Personally we can give testimony as well to the utility as to the existence of the phenomenon.

We learn from *The Photographer* — a MS. journal into which we are allowed to peep, and from which we are privileged to cull such scraps of information as we may judge likely to be of interest or amusing to our readers—that an "official report" from a Committee appointed by a northern Photographic Society for testing the merits of various landscape lenses is to be looked for in the number of the *Journal of the Photographic Society* that appears simultaneously with this.

Now, in the absence of the "official report,"—which, of course, we have not yet seen — and relying solely on the "gossipping" account of proceedings given by Mr. Taylor, we cannot refrain from expressing our surprise at the very desultory nature of examination made.

That the lenses constructed from the recent Petzval formula should give marginal lines curved outwards at the extremities, and those of the ordinary landscape form marginal lines curved inwards at the same parts, might have been *deduced* from a knowledge of the position of the diaphragms in the respective lenses; but in a formal examination it is of course proper that these facts should have been verified.

It is asserted that the meniscus lenses embraced a greater angle of view than the Petzval form; but pending a detailed description of the method of ascertaining this point, we may express our conviction that the statement wants modification to be absolutely correct — thus, "that the former embraced a greater angle of view, *in a given space*, on the plane of delineation."

As the comparison of a number of lenses is a task of no trifling labour, if properly performed, and while there is much able "testing power" running to waste for want of a little judicious guidance, it may not be amiss if we indicate succinctly what are the particular points to which the attention should be consecutively directed. We may premise that optical examination, without taking proofs, we regard as *useless*, except comparatively for lenses all constructed by one formula.

1. *Coincidence or variation of the chemical and visual foci, and if the latter, the approximate amount.*— This is best arrived at by aid of M. Claudet's admirably-designed instrument — the Focimeter — but in its absence a printed paper placed obliquely to the axis of the lens is to some extent available.

2. *Correction for spherical aberration.*—This can be ascertained by using alternately only *half the area* of the lens under trial, first the central, then the marginal parts being employed to delineate the object examined. A piece of brown paper or cardboard, cut in the forms of a ring and a disk, is always available for the purpose.

3. *Flatness of field,* — or rather the amount of its sphericity.

4. *Amount and direction of marginal distortion,* — the amount only requiring actual trial, since the direction can be seen at once by mere inspection of the lens.

5. *Angle of picture,* — how much capable of being included without too excessive an amount of distortion of the image, or indistinctness from sphericity of field.

6. *Definition.*—This will depend materially upon the spherical correction when a large aperture is in use, and it is only with a large aperture that it is needful to examine.

7. *Quickness in working.* — This will depend partly upon the defining power, as governed by the correction for spherical aberration, because the available *angular* aperture of the lens is mainly influenced thereby, partly upon the number and perfection of the surfaces through which the rays have to be refracted, and partly upon the quality of the glass of which the lens is formed. The mere *size* of the diaphragm employed is not important, except as affecting the *angular aperture*, so that by attending to this last-named point it is quite possible to compare accurately the relative quickness of lenses of very different focus, provided that the object delineated be sufficiently remote.

It will be observed from the preceding that there are at least *seven* operations which each lens examined should undergo; but in fact some of these include the performance of more than one experiment. However it must be conceded that by judicious management, several of the requisite questions can be sometimes answered in part or wholly at one operation.

Of the proper centering of the component parts of the various lenses it is almost needless to inquire, as it is to be presumed that no optician would neglect the necessary precautions; but some notice of the peculiarities of the various mountings might well and advantageously be incorporated in any formal report on the qualities of photographic lenses. There are generally far too much brass and too many screws, and the latter are very apt to be made with too fine a thread and too many turns. Diaphragms also are frequently adapted in a very clumsy manner, and "caps" are too often made as if with the special view of easily getting out of order. Although the mounting of a lens has comparatively little to do with its optical qualities, it must be admitted that it has much to do with the comfort and convenience attendant upon its use, and the more the operator's mind is disembarrassed of troublesome manipulatory details, the more he will be likely to address his whole attention to the production of works bearing the genuine stamp of art.

We shall be curious to see how much or how little of the above has been investigated under the auspices of the "chiels o' the north."

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

When a professional photographer of considerable reputation for his skilful and artistic stereographic productions, whose success is partly dependent upon some peculiarity in his mode of operating, is so liberal as to communicate his method of procedure, whether with or without solicitation, for the benefit of the public, we have no hesitation in asserting that the photographic portion of it at least will duly appreciate the boon, and unanimously accord its best thanks to the gentleman who acts in so generous a spirit. Such an one as we have been describing is Mr. Russell Sedgfield, who was kind enough to communicate the method by which he has produced some of the most successful stereographic interiors of our Cathedrals that have been yet offered to the public.

The communication to which we have made allusion, appeared in our number of Aug. 15, at page 197, and we strongly commend it to the consideration of those engaged in similar work to that for which the proceeding was designed, not only because "there are glimmerings of common sense in the recommendation" (as a facetious friend of ours sometimes approvingly remarks), but because also the results tell in its favour. A considerable number of specimens accompanied the communication, and we propose to remark upon them, firstly as illustrative specimens, and secondly as photographic productions.

There are few persons who, being usually in the habit of taking out-of-door subjects, have attempted the delineation of interiors, without experiencing at first many very mortifying disappointments, and this is chiefly owing to the extreme difficulty of realising the extent of degradation of actinic activity in such localities, the deep shadows especially being almost impenetrable. It is generally judged that two or three times as long an exposure as is requisite out of doors will be sufficient, but this is far from being the fact; and then, as Mr. Sedgfield truly observes, an additional obstacle is introduced in the concentration of the free nitrate of silver from evaporation, and the consequent production of stains; to which we may add, a reduction of sensitiveness, from the additional strength of the nitrate of silver enabling it to dissolve away a portion of the iodide from the film.

Now with regard to the specimens sent (sixteen of them), they are, with one single exception, free from stains or flaws of any kind; the one excepted *not* being an interior, and that only slightly affected with minute pin-holes in the sky, a defect in all probability quite extraneous to the particular process employed. Many of the shadows, which must from their nature be very intense, are all transparent, and exhibit correctly every particle of detail that the eye can see; there are no chalky high lights, while the gradation from deep shadows to high lights throughout the whole gamut of semitones is harmonious in the extreme. What more can we say for the fruits of the process?

But this is not enough for the works themselves, which we have carefully and delightedly surveyed. It is quite delightful, after seeing in many of the shop windows where sterescopic slides are sold, such a collection of trash as is frequently exhibited, to enjoy the contemplation of some of our finest architectural subjects so admirably portrayed as in the series before us.

We have recently been treated to a mental visit with Mr. Woodward to one of the lovely dales of Derbyshire; we are now being refreshed, in like company with Mr. Sedgfield, with the cool shade and delicious calmness of the "echoing cloisters and long-drawn aisles" of Norwich and Ely Cathedrals, and some of the churches of Norfolk. We inspect them all at our leisure too, lingering over the cunningly-sculptured stone and wood-work, without the impatient gesture of the attendant verger to recal us with a sudden shock to the unpoetical present.

Of the whole series before us, there is perhaps not any one amongst the interiors more beautiful than The Altar Screen in Ely Cathedral, which must be in reality a perfect gem of carved work. Every inflection of the rich tracery is most faithfully rendered; the subject of the sculpture itself, various passages in the life of Our Saviour, being distinctly visible, and yet the greater part of the screen is in shadow, with the exception of a few of the ornamental figures on the top. The tessellated marble floor in the foreground, the stained glass window behind, and the chequered light falling through one of the side windows, combine to produce a most exquisite effect.

The Choir of the same Cathedral, though equally well executed, is not quite so interesting as the preceding; it is nevertheless extremely beautiful, and includes a magnificently-sculptured monument in the right-hand corner.

The Nave, with the Choir in the distance, forms a third one of these charming interiors, we have also an external view of the East End, and a general view from the Park; but these do not complete the series, illustrative of Ely Minster, as we understand that there are several others taken by this artist. We may remark that the external views are in no way inferior to the internal ones in point of execution.

The Interior of St. Stephen's Church at Norwich is a capital illustration of the value of the process by which it was taken. The dark wood-work of the roof and sittings, contrasted with the whiteness of the stone forming the structure itself, the proximity of some of the ornamental ends to the seats, and the remoteness of others, must have been very trying to the capabilities of the film, as well as to the manipulative skill of the operator.

Norwich Cathedral, though not nearly so rich in ornament as its brother of Ely, being in fact comparatively plain, yet furnishes three interesting interior subjects, viz.—The North Aisle, The Choir, and Chantrey's Monument to Bishop Bathurst. An external view of the West End, and a distant one from the Meadows near Sandling's Ferry form part of series.

The remains of Castle Acre Priory form a subject alike interesting to the antiquary, the architect, and the lover of the picturesque. The point of view is admirably chosen, and the execution every thing that can be desired.

The Ancient Entrance to Norwich Castle will suit our archæological friends, as also The Abbey Gate at Bury St. Edmunds.

The Ancient Bridge, from the Abbey Grounds, in the same locality, in addition to its antiquarian interest, possesses also the charm of being calmly picturesque; in fact its antiquarian is completely outbalanced by its artistic value. The clear waters of the stream, which appear as transparent as unsullied crystal, reflect a portion of some building behind the bridge, which building is itself not visible to the spectator, the reflection being broken up by the reeds and other aquatic plants in the stream.

Two low arches of a quaint and massive bridge, overgrown with ivy, are visible, and behind the bridge, at some distance, the outstretched branches of a stately elm tree are seen; while a figure—unless we are mistaken, that of the artist himself—stands on the bank in quiet contemplation of the water. It is altogether a very beautiful composition.

With the notice of one more subject we shall bring our remarks to a close. An external view of St. Peter's Mangroft Church, Norwich, is interesting in an architectural point of view, and highly effective as a stereoscopic subject, being seen through a vista amongst houses and other buildings, and with numerous figures, and what artists call "stuff" happily disposed in the foreground.

THE SOLAR CAMERA.

It is never without considerable reluctance that we feel called upon to make remarks that appear to express disapprobation or detraction; it was, therefore, with no little regret that we felt bound to append the few words of dissent from the statements made in our two last numbers by Mr. Atkinson and Mr. Woodward, relative to the solar camera. But lest the objections made might be taken in a more extended sense than we intended them to bear, we deem it requisite to enter more fully into the subject without further delay. We may state at once then that we have no doubt, in fact we never have had any doubt, that the solar camera would produce good and enlarged proofs from small negatives, with all characteristic fidelity, and with a certain amount of sharpness, dependent in a great measure on the excellence of the portrait combination employed as the delineating agent. Our doubt was confined exclusively to there being any novelty of principle involved, and consequently to the justice of the claim set up for *exclusive patent rights*. We assert that our doubt was confined to this point before we had seen the apparatus, but since we have done so it exists no longer. In making this statement we must beg our readers to bear in mind that it is but the opinion of an *individual*, and that one *not* "learned in the law." We now proceed to lay before our readers the grounds upon which the opinion we have expressed was founded.

At a meeting of the Photographic Society early in the year 1853, we were shown (privately) by Mr. Wenham, three or four *life size* portraits upon paper—two of himself, one of his brother, and one of a lady—and these were in every way at least equal, we think better, in quality as regards resemblance, definition, &c., to that we saw the other day at the studio of Mr. Kilburn, in Regent-street. It of course could be no mystery to any one acquainted with optical science regarding their method of production so far as principle went; and after discussing some of the details with Mr. Wenham, we instituted a series of experiments with a view to ascertain how far it would be possible, with the means then at hand, to produce enlarged negatives by a double operation, fit for printing from. This we determined was not worth pursuing, owing to the reduction in the brilliancy of definition, which suffered somewhat in every operation, whilst defects introduced at any stage were faithfully repeated in the next.

Although we abandoned the practice of producing enlarged negatives for the reason given, we found that a very pleasing effect could be produced by printing enlarged positive impressions by transmitted light upon glass plates, and then backing them up by an opaque white varnish.

At the request of the Secretary of the Photographic Society papers were read by both of us at the meeting held on 1st December, 1853, a report of which papers is to be found in Vol. I of the *Journal of the Photographic Society*, p. 142 to 146.

On reference to Mr. Wenham's paper, it will be seen that he made use of a magic lantern, employing a transparent stereoscopic picture as a slide and substituting a portrait combination, reversed in position as an object glass—when, he says, "the definition became perfect, so much so, that I at once saw that if the picture

were illuminated by transmitted sunlight, the impression could be readily fixed on sensitive paper with all its minuteness of detail." Subsequently it is explained how a common swing looking-glass was employed as a reflector, to throw the sun's rays through the apparatus.

It will no doubt be objected that eventually Mr. Wenham dispensed with the condensing lens of the arrangement, and printed his proofs by development. He did so for the very good reason that he could produce "sharper" results thereby, as stated in his paper, and without the protracted exposure otherwise necessary. But this does not affect the fact of his having originally adopted the same arrangement as that now in use in the solar camera. But we have very distinct evidence that the *principle* was in use *as applied to the production of photographs* long prior to the time mentioned. We are credibly informed that the Hon. Henry Fox Talbot actually made use of the same principle in the very earliest days of photographing on glass; and we know for a fact, that the Rev. J. B. Reade produced photographs *upon white leather* by *aid of the solar microscope* at about the time of the first introduction of the calotype process, the proofs of which we have personally inspected, and the actual rate of production we could, if needful, readily ascertain from that gentleman. In this case every thing included in the solar camera was employed; for singularly enough the said camera is merely comprised of the box, condensing lens, and reflector — the portrait combination which takes the place of the ordinary microscope lenses not forming a part of the arrangement claimed by Mr. Woodward; in fact its employment in this way was too notorious to permit of its being included.

We have already admitted that the proofs printed from good negatives by means of the solar camera are faithful transcripts of the originals, so far as resemblance is concerned, but very inferior in definition — so much so that few persons would be quite content with them if unaided by the touches of an artist, while certainly no photographer would regard them as works leaving but little to be desired.

We believe that there are few, if any, who employ the instrument that would be inclined to dispute this assertion — certainly not Mr. Kilburn, to whose courtesy we are indebted for an opportunity of examining the instrument and seeing it in action, and who, by the way, expressed himself well pleased with the apparatus.

That it should be deficient somewhat in definition is a necessity of its construction — partly because the method of illumination adopted introduces some disturbing agents, *e.g.*, dispersion of the solar rays by refraction through the condenser; change of their direction in consequence of the sun's or rather the earth's motion, &c.; for although the reflector is made to incline at any angle, and to revolve about the axis of the condenser by means of a not very convenient piece of rackwork, it is not arranged as a *heliostat* as might have been readily done at no more expense than what is already incurred; and partly because the optical arrangement is not that one best adapted to produce an undisturbed impression upon a plane surface from one of a like form.

It was to obviate the errors above named that Mr. Wenham employed parallel rays of direct sunlight and dispensed with the condenser. This also involved the use of printing by development, unless the operator happened to be possessed of an unusual stock of patience; but at the same time it permitted the use of a diaphragm, thus diminishing errors arising from spherical aberration.

We may remark, *en passant*, that though Mr. Woodward does not use any diaphragm actually, yet in effect an equivalent is introduced in consequence of the convergence of the rays from the condenser at a spot very near to that where the diaphragm should be placed, consequently his impressions also are nearly free from disturbance, arising from the sphericity of surface of the lenses.

We have now stated our reasons for the assertion previously made — our readers can judge for themselves whether or not they are well founded; and we declare emphatically that, as regards sharpness of definition, Mr. Woodward's specimens are inferior to those we saw of Mr. Wenham's.

Before finally quitting the subject we may as well indicate how the chief objections which we have taken to the construction of the solar camera may be obviated.

If it be desired to print upon ordinary chloride paper without development, we believe that convergence of the illuminating rays is a *sine qua non*; we must therefore be content to put up with the slight weakness of definition arising from this cause. We need not, however, introduce the disturbance from dispersion, which we take to be far more obnoxious, nor need we incur the additional loss of light from absorption and reflection at the surfaces of the condensing lens, with which we can readily dispense; and, lastly, by employing, instead of the portrait lens, one of the form recently introduced by Professor Petzval, and generally known by the designations, "orthographic," "orthoscopic," "caloscopic," &c., we avoid almost entirely the inconvenience otherwise arising from sphericity of field.

It will be remembered that when our objections to that form of lens were strongest we fully recognised its value for *copying* purposes.

The reflector, instead of being a plane silvered glass should be *concave*, and so disposed that the rays reflected from its surface should converge to a focus precisely at the spot occupied by the diaphragms of the orthographic lens, which, like the portrait combination, should for enlarging be reversed in position. The distance between the mirror and lens should be fixed, though the former may be allowed to turn freely in any direction by suitable contrivances well known. The best form of curvature for the mirror would be a portion of a paraboloid of revolution, as from a surface of this form parallel rays are converged to an absolute point; but we believe that a portion of an elongated ellipse would answer well in practice, and that even a spherical surface would be far better than a plane mirror and lens.

The distance between the reflector and the enlarging lens must in some measure depend upon the focal length of the latter; but in general terms it should not be less than double the length of its principal focus, thus allowing sufficient space for adjusting the negative so as to allow for any required degree of enlargement.

In conclusion, we have little doubt that, if the arrangement above indicated were adopted, employing the parabolic reflector, placed at an average angle of 45 degrees so as to reflect horizontally the light from the zenith, that direct sunlight might be dispensed with for printing upon ordinary plain or albumenised chloride paper, and without much longer exposure than that requisite in an ordinary printing frame. As the varying position of the sun would not in this case interfere with the zenith, no great inconvenience would arise from the protracted time of exposure, whilst the definition would, unless we are greatly mistaken, be infinitely superior to anything that has yet been seen of this kind. The larger the size of the mirror, provided it be placed at a proportionate distance from the lens (of course having a corresponding focal length), the more rapid would be the action of the apparatus, but the more costly in construction. We would, however, draw attention to the fact that it would be useless to include an angle of converging reflected rays greater than the *angular* aperture of the enlarging lens, as the surplus would be simply wasted — not used.

ORGANIC SALTS OF SILVER IN THE DRY PROCESSES.

WHILE spending the day recently with our old friend, Mr. Rosling, whose name is well-known as that of a skilful photographic amateur, in chatting over the subject of collodio-albumenised plates, we expressed some surprise at the lengthened exposure which our friend found it necessary to allow for the plates he was then using, and which were prepared by the original method devised by M. Taupenot, a process that Mr. Rosling esteems above all other dry processes.

The conversion of all the free nitrate of silver into an insoluble haloid or organic salt of the same metal, by washing the excited plate in a solution of chloride of ammonium, sodium, or other analagous compound, or by a similar proceeding with citrate, oxalate, or phosphate of soda, having been lately recommended by Mr. Keene, Mr. Burnett, Mr. Hill, Mr. Hannaford, and others, as rendering the double films *more sensitive* to the action of light, we advised our friend to try the effect upon his Taupenot plates; for, although on trial with Fothergill plates, we were by no means satisfied that any marked increase of sensibility was attained thereby, we think it highly probable that it may prove to be the case *under a judicious mode of development*.

Mr. Rosling has since favoured us with the following note relative to the result in his hands: —

"DEAR SIR, — I have tried a bath of citrate of soda for the Taupenot's plates after the last sensitising, and *cannot* find that it increases the sensitiveness in the least — if anything, I fancy it rather diminishes it. I still think there is a little advantage, as it produces a somewhat blacker tone, which is preferable for printing. I tried it on two stereoscopic plates, in two separate cameras, with a pair of lenses which work together in one camera, and produce the pair of pictures exactly alike. I gave the first picture in each

camera two minutes, and the last four minutes, working both cameras together, so that I am fully satisfied on this point. I intend to try the keeping qualities of each.

"I remain, very sincerely,

Reigate. "ALFRED ROSLING."

The comparison was made between a collodio-albumen plate, washed with plain water, and another with solution of citrate of soda, each plate being placed in a bilens stereoscopic camera, each plate having one-half exposed for two minutes simultaneously with its fellow plate, and the other half in like manner for four minutes. We are of opinion that by slow development, as recommended and employed by Mr. Kibble, the advantage might show itself, as the citrated plate would probably bear longer development than its fellow, without staining. The experiment was well designed and fairly performed, and is decidedly of value.

PHOTOGRAPHS OF MICROSCOPICAL OBJECTS.

THERE is, perhaps, no branch of photography in which a wider field is open to a skilful and enterprising manipulator than that of producing a well-arranged series of true microscopical studies; not only on account of the beauty and interest of the subjects to be depicted, but because, so far as the public are concerned, it is almost untrodden ground. It is true that here and there a few well-executed specimens have made their appearance now and then at our exhibitions, but, as a rule, they have been simply distinguished as "Studies of Microscopic Objects;" and nine times in ten the passing remarks of casual observers amount to the words, "What queer-looking things!" while the names of the objects delineated, when appended, generally get classed as "crackjaw." It is true that occasionally a microscopist will readily enough recognise some of his old friends; but, alas! we own it with sorrow, the best of the photographic depictions present but the mere caricatures of the brilliant originals. They may be, and sometimes are, very valuable for certain purposes, but few of them are such as to be cared for, much less coveted as works of art; whilst we have but rarely indeed seen the novice take his first glance at the objects themselves, without, at the same time, witnessing an unmistakeable degree of enthusiasm, accompanied by expressions of wonder and admiration.

Now why should photography be thus behindhand in depicting some of the most beautiful and interesting subjects to be found in the whole creation? The question is not difficult to answer. It but rarely happens that the accomplished microscopist and skilful photographer are combined in the same person; and when they in rare instances are so, it is certain to be amongst amateurs, who generally have other pursuits as a business or occupation, and are thus deficient in very important elements to the production of an extended and systematic series of illustrations, viz.—time, and opportunity to use it.

Nor must it be forgotten that even if both qualifications requisite are brought to bear upon the pursuit that the circumstances under which they have to be exercised are entirely new, and the optical difficulties, sufficiently great in themselves, are aggravated by the fact that the lenses are not constructed with a view to their diactinic qualities.

These remarks have been called forth in consequence of our having been favoured with some specimens of photo-micrography, the work of Mr. Archibald Briggs, of Liverpool.

They are evidently the production of one enamoured of his occupation, but we must candidly admit that they are sufficiently good to make us wish them better—that is, they strongly recal to mind the images they represent, but the glory has been shorn, the delicate membrane, the gem-like brilliancy, are absent from their respective places. This is not so much the fault of the operator as that of his tools, and the want of knowledge upon certain points connected with the pursuit under which all are as yet suffering. The day will no doubt come when both of these drawbacks will be removed; but, for the present, we must be content with such presentments as our limited means will enable us to effect; and certainly those before us are of more value to the public than any we have hitherto seen, for not only are they well executed, so far as the means allow, but they are accompanied by a short description appended to each proof, together with an indication of the degree of enlargement under which the several objects have been taken.

The specimens are four in number, and consist of

1st. The epidermis of the common white caterpillar, enlarged about eight diameters. The negative from which this is printed was produced, not with the microscope, but by aid of a photographic portrait combination attached to the solar camera, and was taken *instantaneously* upon one of Dr. Hill Norris's dry plates.

The details of those parts *not* of a yellow colour are extremely well brought out; but where this colour prevailed, they are, as might be anticipated, deficient—as, for instance, in the beautiful fringe-like set of hooks with which the supplementary feet are furnished.

2nd. Frustules of the Isthmia Nervosa, the siliceous cuticle of a very interesting class of plants known to botanists under the name of *diatomacæ*, or brittleworts, as Lindley has designated them.

This plate is far less satisfactory than the preceding; at the same time, it is a much more difficult subject to handle. The frustules have a considerable degree of thickness, and are anything but flat, while the structure and constitution (the latter resembling the purest crystal) are but ill capable of representation in mere black and white.

3rd. Section of the spine of an Echinus, one of those prickly-looking balls found on our sea-shores, and variously known as sea-eggs, sea-urchins, &c. The specimen operated upon has not been happily selected, being one of the least complex and beautiful of these exquisitely-constructed objects, some of which present the most charming resemblance to elaborate Gothic tracery. Neither has the specimen been too well cut, and appears to have been rather too thick. It will, however, serve to open the eyes of the novice to the singular and admirable contrivance for insuring strength combined with lightness.

4th. The tracheal vessels of the silkworm. This is perhaps the most effective object of the series as a photograph, the spiral coils of fibre designed for keeping distended the elastic membrane constituting the tube, being beautifully rendered. But here again the membrane itself is lost, and no wonder, for it is only by careful manipulation and peculiar illumination that it is apparent to the eye in the microscope, when drowned as it were in a flood of light.

We are glad indeed to see this first instalment of what may entice many to the study of microscopical science, a study that we have followed more or less for a quarter of a century, and which we are daily more and more convinced is absolutely inexhaustible.

It is, however, by following out the delineation of a special class of objects that we think most good is to be done; and if any photographer has a mind to commence such a work systematically, we will suggest one that we believe would be interesting, *popular*, and not too difficult to begin with—say, for instance, a series of sections transverse, tangental, and radial, of all the kinds of wood in ordinary use for cabinet, building, and shipbuilding purposes. We have not a doubt that such a series, if well executed, would meet with a ready and extensive sale.

OXYPHENIC ACID, A SUBSTITUTE FOR PYROGALLIC ACID.

MR. WAGNER was the first to suggest the substitution in photography of oxyphenic acid C^{12} H^{6} O^{4} for pyrogallic acid, which is very costly. It can be prepared in the following manner:—Take a given quantity of crude pyroligneous acid, and distill it, as is done when pure wood spirit is obtained: agitate the syrupy mass, the residue of distillation, in contact with a concentrated solution of common salt. The salt dissolves only a very small quantity of the bituminous matters, but removes all the oxyphenic acid contained in the crude pyroligneous acid. It is filtered to remove all the bituminous matter, and the filtered liquid is agitated anew with an equal quantity of ether. The ether dissolves the oxyphenic acid, and retains with it a certain quantity of acetic acid and oil of tar. The ethereal solution is decanted and submitted to distillation. When nearly all the ether is volatilised, the temperature is raised, and a current of carbonic acid passed at the same time into the retort through the liquid. The current of gas drives off the acetic acid, then the oxyphenic acid and a brown oil; the middle portion is received separately. It is then cooled, and a crystalline magma is obtained, which is pressed, then distilled anew, or sublimed in a current of carbonic acid, forming colourless crystals of pure oxyphenic acid. They form rectangular prisms, perfectly dry at 176° F., which melt at 230° to 240°, the liquid resulting from their fusion boils at 464° to 473°, and is reduced into a colourless vapour, which becomes liquid on cooling, forming magnificent crystals. These crystals are very soluble in water and alcohol, less soluble in ether; the aqueous solution exhibits a slightly acid reaction, and a faint odour of butter: it reduces very readily the salts of silver, and the chlorides of gold and platinum. Rendered slightly alkaline by the addition of a little potash or caustic ammonia, it rapidly absorbs oxygen, becoming first green, then red, which distinguishes it from pyrogallic acid, which is first brown, then black.

IODIDE OF CALCIUM.

The mineral best adapted for preparing iodide of calcium is gypsum, or natural sulphate of lime.

Take eight parts of calcined gypsum and mix it intimately with three parts of carbon. Place it in an earthen crucible, and submit it to a light red heat for about an hour.

The sulphide thus obtained is mixed with water, and iodine projected upon it little by little, frequently stirring the mixture, the temperature of which rises considerably during the operation. Continue adding iodine until the liquid is no longer colourless after the addition, then add a little slaked lime, and leave the liquid to repose for a few hours.

The foreign oxides, arising from the gypsum or carbon—alumina, silica, iron, and manganese — remain as precipitates. The liquid which is nearly colourless and slightly alkaline, must be quickly evaporated to dryness.

The heat must be stopped as soon as iodine begins to be disengaged. The crust of iodide is detached and put into a porcelain crucible, closed by a cover. This crucible is placed in an earthen crucible, the intervening space between the crucibles being filled with powdered charcoal, and a cover fitted to it. It is then heated for half an hour at least.

When removed from the fire and allowed to cool, break the porcelain crucible, and detach the iodide, which appears under the form of large scales of a pearly lustre, like chloride of magnesium, and which, like that salt, is easily crushed under the pestle; very different in that respect from chloride of calcium, and the iodides of barium and strontium, which are much more resistant, without micaceous structure, and indecomposable by sodium.

A New Use for Photography.—A correspondent of the *Liverpool Mercury*, Mr. F. D. Murray, says:—"Excuse my troubling you on a subject of more importance as regards public taste than public interest. It is the insertion in tombstones, monuments, &c., of the photograph of those who are taking their last sleep beneath, leaving to parties themselves or their friends the choice of that period of life at which such "photograph of remembrance" should be taken. I think it would be a pleasing and loving memorial for friends, relatives, and acquaintances to look upon. The only way in which my proposition affects public interest is, that photographs so placed would invite the visits of thousands, and those thousands would reap the benefit of the influence exercised by a stroll through a graveyard, and which influence would, in my opinion, tend to make us better men and wiser women."

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

This Journal being the official organ of the above-named Society, it becomes our duty to remind the members thereof that the first ordinary meeting for the ensuing session will be held as usual at Myddleton Hall, Islington, on Wednesday evening, 28th inst. The chair will be taken at eight o'clock.

It is requested by the committee that papers and other communications for the Association be forwarded to John Barnett, Esq., Honorary Secretary, 9, St. Peter's Terrace, Islington, to whom also candidates for admission as members should apply.

Apparatus, &c., intended for exhibition at the meetings should be forwarded to Myddleton Hall, to the care of the Honorary Secretary, by *seven* o'clock on the days appointed for the meetings.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The first meeting of this Society for the present session was held on the evening of Tuesday, the 30th ult., at the Odd Fellows' Hall. Mr. T. Morris presided.

Woodward's Solar Camera was the subject appointed for discussion. In the first place, Mr. Hart, a member of the society, narrated the experiments he had made with a very rude and imperfect apparatus, and with the additional disadvantage of having had very little previous practice in working the paper process. Still he laid before the meeting several tolerably good enlarged portraits. One practical hint which he had gained from his short experience was, that the size of the negatives should be regulated by the size of the picture. Another was, that in the focus of the double combination, lenses of different makes produced different results as regarded the sharpness of the picture. He was not prepared to say which process would be the best, but he was inclined to think that a good, clean, and easy method of developing would secure the best results. There could be no doubt that splendid work would ere long be done by Mr. Woodward's instrument, and he hoped that no attempt would be made to deprive him of the credit which was justly his due.

The Chairman: I have had some experience as to the instruments, but not much as to printing pictures, though I have had the opportunity of seeing what others have been doing, and have been present at many experiments to get these pictures perfect within a reasonable time. The delay incidental to the process has been one of the objections. Some operators have taken as much as three or four hours, and others as much as two days: some tell me they have exposed pictures for four hours, a good size, and that it would have been a nice picture if they had only given it another hour. Of course it is possible to make a sensitive paper so insensitive that it cannot develop; but the portrait I now produce (a remarkably vigorous one, nearly life size) was printed to-day in two minutes, and, if anything, seems somewhat overdone. It is a developed print but by a new process; and altogether not more than half an hour was occupied, though I am convinced those pictures can be taken in two seconds. As to Mr. Hart's remarks with reference to different lenses, one point must be borne in mind in selecting a lens for a solar camera. The condensing lens is of a given focal length—17 inches in large instruments—and whatever combination you employ to produce your picture, you should so arrange it that the pencil of light crosses exactly in the centre of the front lens. It is essential that before you attempt to focus your picture, the lens being a fixture and the combination inserted, you should so move the rack as to bring this lens either outwards or inwards until you get this pencil of light exactly upon the centre lens. Then it does not matter how distorted your picture may appear upon the screen, as you may move it by the negative being moved backwards and forwards.

Mr. Osborn: Would that have any effect upon the time of printing?

The Chairman: Decidedly, and also on the sharpness of the picture. We all know that if you take a lens that produces a sharp clean picture, of a given focal length, you will always find that that lens works quicker than one which gives a soft picture. The picture I now produce was taken with a quarter-plate lens. The process by which it was taken is by no means the most sensitive. They can be taken by artificial light with this instrument. The developing process is an American one.

Some remark having been made as to developing trays, Mr. Turner (a co-worker with Mr. Morris in the experiments) said it would be found necessary to have them of glass, and there should be one for the silver and another for the albumen. Operators must also be particular what kind of paper they had for the development; it must be very good. The paper ought not to be touched at all with the finger, or the picture would be spoiled. He (Mr. Turner) had no doubt that ultimately they would get a picture in twenty or thirty minutes by means of the ordinary gas-light. Walking across the room while the development was going on must be avoided, as vibration would spoil it.

The Chairman, in answer to a question, said he had no doubt that development would be found the most economical process, especially for large prints.

A vote of thanks to Mr. Hart closed the proceedings.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. V.

The Convent of Saint Saba is one of the most singular places in the world. Its origin is easily explained. In early Christian days, when monachism began to prevail, and when the idea gained ground in the Church that sanctity was to be attained by a hermit's life, the Wilderness of Engeddi offered special inducements to the devotee. It was, as it now is, a wild, bleak country; mountains broken up by deep ravines, destitute of food for man, almost destitue of food for wild beasts. In the sides of the deep ravine of the Kedron were numerous small grottoes and caverns, in which many hermits took shelter. Here was the cell of Saint Saba, a good and great man, who performed miracles. Other cells were near. Little platforms of rock were hewn out to connect one with the other. The hermits formed a community, and at length began to build stone huts on the shelves of the rock. Then wealthy men visited them, and began to build them chapels and rooms, clinging to the rocky hill-side. So grew this marvellous building in mid-air, now looking as if it were growing up to heaven, and now as if it were falling down to the depths. It now belongs to the Greek Church, and is inhabited by Greek monks.

I presented a letter under a high window in the wall, and the basket was lowered to receive it. A few moments later the small door in the wall was opened, and I passed in.

The interior of the Convent is not worth describing. There is the tomb of the saint, a cave full of hermit's bones, a fine alterpiece by Murillo in the chapel, some curious old books in the library, and the usual cells of the monks.

I accepted their hospitality for the night, much as I abhor a Greek convent. The fleas in them are armed with the spears of the men of Marathon. Thrice I composed myself to sleep that night, and three times I sprang from my couch to the middle of the floor, as a new troop of the blood-thirsty villains made an attack upon me.

Think of me alone in that large guest-chamber, the moon shining down the ravine and into the windows, pacing up and down the room, shouting out an occasional stave of a song to keep up my spirits, and to keep down the ghosts of Saba and his followers. My profane songs must have disturbed the vigils of the holy brethren; for two or three times I heard a sandalled foot-fall on the pavement outside, and saw a face too solemn and pale, even for a ghost's face, at the window which opened on the little court next to the tomb of Saba. I fear the monks repented them of their hospitality.

Once, I believe, I fell asleep; for as I lay on the cushions, with my boots on, and my *tarbouche* drawn down over my forehead, with a determination that I should bid defiance to fleas and all other midnight marauders, there came stealing over my brain and heart a silence and a calm, delicious and holy, which I have not words to describe. And then a dream took possession of my soul. I was a boy, in the dear land of home: the breath of a summer Sunday morning was on my forehead. I walked down that shady lane where the elm-trees meet overhead, and the glory of the day scarcely prevails to reach the ground through the green leaves. And then over the hills came, clear and musical, the bell from the old church on the green; and I walked on till I came to the church door, and the great bell pealed overhead as I went up among the graves; and so I passed on into the church, and ——

How swift are the wings of our dreams. I could have slept but an instant, and the convent-bell was ringing for midnight mass, and I was awake again. But I had dreamed gloriously! I would go down to Saint Saba again to-night, spite of Bedouins and fleas, could I hope for such a dream once more. I am a far wanderer, and it is long since my weary feet walked that old country road.

I went into the dim chapel and prayed with the monks. The scene was picturesque: it reminded me of one of Daguerre's wonderful dioramic pictures, *The Midnight Mass;* but I was sleepy. Morning found me in the same condition.

Pardon me for breaking off abruptly. There is a terrible row outside among my Arabs, and I must go and see what is the matter!

I was interrupted by an uproar outside my tent. I had some misgivings as to the cause of it, as John had got into trouble some days previously with the Pasha's soldiers, and I expected nothing less than that the hour of our annihilation had arrived. I seized a pair of revolvers and rushed forth. I found that the row among my Arabs was caused by the approach of a distinguished visitor, no less a person than Mohammed Bey, a wealthy and intelligent Turkish gentleman, resident in Damascus. He had heard at Jerusalem that a necromantic infidel was pursuing his black art in the neighbourhood, so he came to see and judge for himself. A great favourite everywhere among the Bedouins, his approach elicited shouts which were very unusual among my quiet guard. I hastened to meet the Bey. About a hundred yards from my tent stands the Pillar of Absalom, that melancholy memorial of a disobedient son, at which Jews, Turks, and Infidels, cast stones as they pass by. Here the Bey halted; but as the rain was still pouring down, I invited him to take shelter in my tent, gave him a seat upon my bed, a pipe of Latakia, and—a cup of coffee.

My distinguished guest spoke French fluently. After a few hours the sun broke forth out of the western cloud-banks, and poured a flood of splendour over the minarets of Omar and Olivet. The red masses, brilliant and sanguineous, went flying eastward to the wilderness, and the day went down, calm and clear, and beautiful, and I still sat talking with the best of Pashas and the most gentlemanly of Turks.

With true oriental politeness he never alluded to the object of his visit. But I had divined it; and to gratify him brought forth my portfolios and displayed the precious fruits of my photographic labours since my arrival in Palestine. He eagerly scrutinised every picture, and after careful inspection, pronounced the name of each, and when I bowed in token of assent, his bright eye sparkled again, and the shadow of a smile played around his mouth. This inspection over, I planted my camera at the door of the tent, and with the aid of a mirror let him view the mimic scene. He was lost in wonder and admiration, but could not divest himself of the idea that the objects themselves were in the box. And when a living object crossed the field of view, his perplexity was extreme. *Mashallah! Mashallah!* he cried, God is great! I endeavoured to explain to him the nature of the instrument and the *modus operandi* of taking a picture; but as it was growing too late in the day to make an experiment, I invited him to come again in a few days, when I would go through the ceremony or incantation, as he called it.

I had made a friend of the Pasha. He evidently regarded me as a superior being, having powers till then unheard of in my hands. He took his departure with many expressions of friendship and oriental compliments, which in modesty I cannot venture to pen.

The Bey was punctual in his visit to-day. He came with troops of friends and retainers, and I have had a pretty hard day's work of it. I had made extensive preparations; and among other items, was fortunate enough to procure a basket of champagne. It happened to be our gracious Queen's birthday, and I resolved to celebrate it after a fashion of my own. My photographic operations were watched with intense eagerness — nay, with awe. My guests evidently expected an explosion from my camera, and kept at a very respectful distance. Business over the fun came next in order. It commenced by letting of some Chinese crackers, which created an immense diversion, but so alarmed my faithful Hassan that he threw himself on the ground in a state of collapse. John proposed that he should be revived with a glass of champagne, which being duly administered, soon produced the desired effect. He asked for another, not with his tongue, but with his eyes, and it seemed to agree with him so well that we administered half a bottle. We had not calculated its effect upon Hassan. He soon grew uproarious, and performed some very singular antics which so amused the Bey that he laughed until the tears ran down his beard.

I had provided a dinner for my guests. It was served with the addition of wine. The Bey had been in England, and understood "dinner," and when his health was drank responded in an elegant and complimentary speech. It was a curious scene. His officers and servants crowded around, and watched with wistful eyes, the wine disappear down our irreligious throats. But perhaps I ought not to call it wine, since they did not. For some reason or another champagne is considered by most Moslems an allowable drink, and many worthy and intelligent men, like my friend the Bey, who strictly refuse ordinary wine, drink champagne and sometimes brandy.

The Bey is a keen observer of men, and though he drank freely there was no one of the party less affected by the wine than he. Polite, affable, and dignified, he was at the same time full of the spirit of the occasion, and was polite enough to say that he would like to dine in the company of Englishmen every day.

While our little drama was being enacted beneath my tent a critical episode was taking place outside. An extra half-dozen of champagne, set aside as a reserve, had been scented out by the Bey's scribe and the Cadi who accompanied him: they helped themselves, and I am sorry to say got most uproariously drunk. The Bey was chagrined and angry at this breach of decorum on the part of his staff; but John smoothed the matter over, and took upon himself the rather difficult task of seeing the representative of the clergy of Islam to his tent in safety.

I could not help laughing to see John helping the Mohammedan clergyman along that evening. The worthy Turk depended heavily on John as he swung along, muttering sentences, not from the Koran, but such as would have subjected him to a fine from any British magistrate. But it was our Queen's birthday!

Coffee was served, and we smoked and talked, and the hours sped along. And how swiftly the hours fly over these Eastern skies! Life seems not half long enough to enjoy wandering up and down the hills over which I have been so long a rover.

With the night came silence! In the moonlight we walked down the valley. The fountain at the pool of Siloam murmured pleasantly, and we sat down beside it. A troop of Bedouin horsemen came dashing up the valley, and paused before us. The leader sprang to the ground as he recognised my guest, and pressed the Bey's hand to his forehead and his lips, then silently

remounted and rode on. An owl flittered in the air overhead, and soon sent his sharp scream down from the caverns near Siloam village, across the valley; a dog on mount Zion answered with a bark, and the shrill cry of jackals above us on the hill of Acaldema rang up the valley of the sons of Hinnom. So the nights of these later years pass with the cry of the owl and the wail of the jackal over desolate Jerusalem.

The day's fun is over; the tents are closed, and the Arabs lie sleeping in the night air around. I am the only living object moving about. All is silent and calm. I retire to my tent reluctantly, for there is a charm over the scene from which I can hardly tear myself away; but the air is chill, and I know not what ill effects it may exercise upon my frame not yet inured to the climate.

P.S. — Mohammed Bey has a head-ache this morning, and is a little repentant, as most people are after "dining out." I went to his tent to inquire after his health, and we renewed our vows of eternal friendship over a cup of coffee. In my travels through life and the land of the Philistines, may I meet with no worse acquaintance than Mohammed Bey; I can hardly hope to meet a sincerer friend. May his shadow never be less! D. T.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER V.

COLOURING WITH DRY OR POWDER COLOURS.

Daguerreotypes and glass positives are generally coloured by a very easy process with dry brushes and powder-colours, by the aid of which some of our more skilful operators produce effects closely allied to those of coloured crayons.

The method of manipulation is so very simple that, save in the selection of tints and colours, there is not much to teach, and consequently not much to be mastered by the pupil in the shape of mechanical difficulties. Until very recently, powder-colours were prepared with so little reference to the surface to which they were intended to adhere, that this branch of photographic colouring occupied a very insignificant position; and the only directions of *a practical nature** that could be given for their use were simply to *dust* on a little pink or flesh colour here, and *dust* it carefully off there, blow it gently to remove the *very* loose particles, and—that was all: the powder once on in the form of *dust* of a certain colour could not be retouched, because every attempt to add more colour merely removed that already applied. Under these circumstances, it was only colourists who prepared their own pigments with a knowledge of the peculiar requirements of this process, and the means of meeting them, who were really successful.

Now, however, if the amateur meet with such difficulties it is his or her† own fault; for although bad powder-colours are very extensively sold, some of our best colour manufacturers have undertaken their preparation, and thus bestow a really artistic power in their application to the collodion or metal surface. M. Mansion, the first of our colourists in this branch, has advertised his colours for some years. Mr. Newman has also produced a very excellent set of colours, and more recently such colours, with peculiarly attractive qualities, have been introduced by Messrs. Reeves, of Cheapside.‡ I find in practice that the colours of Mansion and Newman are best applied before and after varnishing; but those last named do not require this, as the simple act of breathing appears to fix them sufficiently for the reapplication.

THE MATERIALS.

The colours are sold in small bottles, and their tints and shades are indicated by names (suggestive of their use) and numbers. If a box of these be purchased it will be provided with a set of earthenware saucers to contain the colours, or a palette of velvet for the same purpose, brushes, gold and silver shells, &c.

The brushes or pencils should be carefully selected In oil or water a somewhat inferior brush, being aided by moisture, may do; but the dry brush will not retain its point unless it be of good material and carefully made. As softness is one of their most desirable qualities, the *dark* and not the red French sables will be found best. They must be carefully preserved from dust, well rinsed after use and pointed with the lips before being put aside to dry. It is desirable to keep a good supply of brushes, as they soon lose their fine point when in use, and this can only be recovered by moisture, after which they are not again fit for service until *perfectly* dry. A camel hair brush, called a "duster," will also be required.

The blower — An Indian-rubber bottle with an ivory mouth-piece, used to remove loose superfluous colour.

Varnishes, &c. — A varnish prepared expressly for the reception of dry colours should be selected, as very few indeed of the ordinary varnishes (if any) take the powders well, being too hard and smooth; that sold by Henry Squire and Co., for the alabastrine process, is one of the best varnishes for colouring upon that I have met with; but a solution, not a varnish, sold by Messrs. Reeves, holds the colours firmly — indeed, for those who desire to *colour* highly, nothing can be better. A black varnish is sometimes used for "backing up" the glass positives, the principal effect of which is the utter destruction of depth and transparency in the shadows, the changing of the purest whites into a leaden grey, and the imparting of a dull, heavy, and metallic appearance to the whole picture: such a photograph will *never colour well.* The best material for "backing up" is a dark maroon velvet, which having depth in itself *and colour*, is no small assistance both to the photograph and the colouring. A solution prepared as follows has been strongly recommended by some professional friends, but I have never tried it: — put a little Canada balsam into a bottle with some spirits of turpentine, and allow it to stand a day or two; shake well, and add about 13 drops of it to one ounce of spirits of turpentine in another bottle; mix well; filter (with blotting paper), and apply it as you would collodion (viz., by steadily pouring into the centre of the plate, gently inclining it to and fro until the whole surface of the positive is coated, and then pouring back from the corner opposite that it is held by); dry with heat. Should the colours bite *too* quickly, add a little more turpentine to the solution.

THE FIRST COLOURING.

Your picture duly selected (and if you use Messrs. Reeves's solution, as I do myself, duly prepared), select a clean, well pointed, and *quite dry* pencil, take up very little colour, and apply it with a *gentle* rubbing motion in a circular direction. As is usual commence with —

THE FACE.

Take up the pale orange, or the "horizon tint," and mix with a little white: with this colour (a pale, warm yellow) strengthen the high lights (see maxim 40) which will be found upon such portions as are most prominently exposed to the more direct rays of the light, such being of course the top of the brow, cheek bones, the nose, and chin, upon the lighted side of the face: soften this into the "local" tint of the flesh, which may be represented by either of the prepared "flesh tints," with or without the addition of a little warm brown, orange, or carmine, as the complexion to be imitated may determine. Darken the local tint as you approach the half-tones, carefully avoiding the *darkest* shadows, which *the powder colours always destroy.* Where the skin is thin the blue veins will tinge the flesh with their own colour, therefore touch a little pale blue upon the corner, between the eye and nose, the temple, &c.: a stronger blue, green, or purplish grey, if your subject be a man, may be required about the upper and lower jaw. With careful touches colour the lightest part of the upper lip with a little crimson, and that of the lower lip with pink, No. 1, finishing it with carmine. If the eye be blue or brown, put a touch of either colour, *with extreme care*, into the iris diagonally opposite the "spark" or gleam of strong light in the eye (see maxim 45). Should the hair be light, a little of the requisite colour may be worked over the lighter portions.

Letters to a Young Photographer.

No. XIX.

My dear Eusebius,

If I were not satisfied that you possess the sixth sense I spoke of in my last, I should not trouble myself to proceed any farther in disquisitions upon Art and Nature. But as I know you are an artist born, and eager to study the principles of Art, let me, who have groped my way through darkness and discouragement to something like clear views upon this subject, hold up a torch, as it were, to you who are but now starting on your journey,

* Many writers upon this subject, in their ignorance of the manipulatory difficulties have given their readers instructions copied from works upon miniature and portrait painting, which. although very good in themselves, were curiously impracticable with such appliances as powder-colours and dry brushes, and must have sorely bewildered all who essayed their skill under such guidance.

† Most of the professional colourists in this peculiar branch are ladies.

‡ The new "Absorbent Photographic Powder Colours."

and haply I may prevent your falling into many bogs and quagmires into which the *ignis fatui* will lead you, if you follow their light "that leads astray."

I do not arrogate to myself any special knowledge on the subject, but have studied much, and, sorest of trials, had to unlearn much that cost time and labour to learn. I have sought to learn many things, prove all, and will now hold fast to that which is good. Art-teachers I have generally found to be blind teachers of the blind. For a long time I looked around for a set of principles upon which a sure foundation might be built. I was presented with a host of unmeaning phrases — mere words, the senseless echoes of forgotten axioms. With us Art is an exotic; it comes to us from other and more genial climes, and suffers greatly in the transit. For the most part, our Art is sunk into a process of mere manufacture. Our pride is greater in the past than in the present. Few amongst the present race of artists are worthy to wear the mantles of fame and honour, worn by our Gainsborough and Flaxman. Few of our artists can draw well; still fewer can colour naturally. Undeserved encouragement and blind patronage have fostered exaggeration and conceit. And the British school of Art, in this middle of the nineteenth century, has no better representatives to hold up to the admiration of posterity, than the so-called pre-Raphaelites, who might just as reasonably call themselves pre-Adamites.

But I must proceed with the burden of my song, my symphony being quite long enough. I have struck the key-note, and you may anticipate what you are to expect.

The beautiful, and by the beautiful I also understand the good and the true, is the province of the artist's labour. When the artist justly appreciates the nobleness of his mission, he paints only the good and the true. Woe to him if he deals only in shams: if he sets up ignorant formality and blind conventionality for Nature and her truths! If he would be great he must study Nature. But how shall he study Nature? what are the means? which is the method? where is his guide?

I begin to feel the magnitude of my presumption in attacking this momentous question; but having picked up a few crumbs that fell from my master's table, I proceed to share them with you.

We are sometimes told by those who discourse on Art, that the object of Art is imitation. But if we go farther, we learn that imitation is the lowest form of Art: it being the means and not the end. When an artist paints a noble head or beautiful landscape, he does not imitate the skin and hair, the sky and water, but he *represents* them. Art is a representation. If the aim of the artist in copying Nature was strict imitation, it would be as much as to say that the highest degree we can attain in Art is to deceive the eye; but to deceive is one of the lowest steps. Art operates, it is true *by* imitation, but not *for* it; it is the instrument of its conceptions, which has only to be true and faithful, but it is neither the result nor the limit. Nature, the source of all imitation, furnishes the elements, but it is Art that combines them. In Nature these elements are vague, scattered, and confused. Art selects and arranges them. Nature presents beauty in scattered fragments. Art collects and assorts them. Nature is dumb and inert matter. Art clothes it in thoughts and gives it a language.

The artist desires to represent a given object upon paper or canvas. This object is a solid body, and like all bodies, has three dimensions, and we desire to represent them on a body that has only two. What means shall we employ to attain this end? Three, and no more:—outline, relief, and colour. But these three means may be reduced to two; for in painting we can represent objects by form and colour only. Now outline and relief are the two elements of which the imitation of form is composed: they differ in their nature and also in their method; and in the analysis of imitation as a means we must consider them apart.

We will first compare these three means of imitation together, and then study them separately, acquiring a clear idea of each.

The outline is that line by which I define the space occupied by the object to be represented. In proportion as my eye follows the contours my pencil traces them on the paper. So far as the conveying of an idea of the object is concerned, the outline is all-sufficient, and we may dispense with relief and colour altogether. You may see the power of outline in the hands of a master by turning to the "outlines" of Flaxman, every one of which is as completely a picture, in the sense of a picture being a representation, as if it covered an acre of canvas painted in the most glowing colours. Let the painter labour as he may, he cannot with the most elaborate pains produce a *greater result* than he can by the merest outline. But the outline must be traced by the hand of a master.

But there is a host of forms which we cannot put on paper by means of mere outline, such as, for instance, those which express projection. To represent all the modifications certain bodies contain we must have recourse to relief, and give additional touches to my drawing in outline to render it a true imitation of a solid body, I obliterate the outline altogether; and yet of the three elements of imitation it is the most important of all. Outline represents essentially the character of the object: relief, concurring to the same end, does not bring so many elements, or concurs only in a secondary manner.

Colour is the lowest means of imitation. It is surpassed by the other two; it is nothing without them. In fact, many imitative arts content themselves with the first two means: sculpture, for instance, which employs contour and relief, and expresses everything by form and nothing by colour. The Laocoon is white, yet it respires, suffers, groans. The Venus de Medici, despoiled of her fresh and delicate colours, is beautiful, voluptuous, and modest.

It is the same with engraving, chiselling, drawing in India ink, and in photography, which act through form and not through colour. From this it results on the one hand that colour alone is powerless to imitate, while on the other it is necessary to a complete imitation.

We may by another way discover which of the three concurs most to the highest results of Art, and here again outline appears to be that one.

The highest results of Art — "high Art"—are those which represent the character, expression, and emotions in man and other animated beings; those which transfer to canvas tenderness, anger, remorse, shame, and revenge; those that depict life and action.

Now in representing these things outline is all-sufficient. Before the colourist had applied his swarthy tints, the outline had informed me that this man was a robust African, by the form of his face, by the curling of his hair, by the height of his cheek bones; his country was known to me, his savage energy displayed. Before those pale and livid hues had combined to interest me in behalf of the dying Dido, already had the outline revealed to me the drooping eyelids, the half-closed eye, the depressed eyebrow, the weakness of her arms, her langour, her expiring mouth, the last sighs of this forsaken lover. Before the fire and magic of the pencil had animated this scene of carnage, already, by the aid solely of the crayon, I had seen the mettled coursers, the disordered lances, the rushing of battalions, the terror of the fugitives, and the agony of the dying warrior.

The idea I have of the part which each of these means plays in a composition of the kind I speak of — "high Art" — is, that outline, aided by relief, speaks directly to the heart, mind, and soul — to whatever is elevated and noble in our nature. Colour flatters the eye beyond every thing, and deludes it also; it excites the imagination, it unites with the poetical, but rarely penetrates the heart.

In proportion as we descend from "high Art" to Art of a lower grade, outline and relief are diminished in importance, and colour gains advantage. In a landscape, colour, next to good drawing, is every thing: here the passions, action, or life have little or nothing to do. If you imagine this landscape, or rather *sea*-scape, reduced to the representation of a clear sky and calm sea, a single line, drawn with a ruler, to represent the horizon, forms the picture — all the rest belongs to colour. Imagine all the intermediate conditions, and you will come to see that the relative importance of colour increases in proportion as the nature of the composition departs from the region of "high Art."

These truths are so simple and self-evident that it would appear idle to mention them; nevertheless they are but little appreciated, and I think but little known, although they are the basis of all just appreciation of the imitative arts.

It is a curious fact that, of the three means of imitation, outline, the most excellent, is of the three the only conventional one; it does not exist at all in nature, and disappears in the complete imitation. Outline is an aid, nothing more — a thing that exists only by convention. By it we express the limits or boundaries of the space the object occupies, not only because this limit is so expressed in the model, but because we have no other means of expressing it.

However arbitrary and conventional it be, its power is none the less real. It speaks most to our intelligence, because it traces artificially that which first strikes the attention in every object. Before remarking on the colour of a shield, or the relief of the chiselling that embellishes it, I have already observed if it be round or square. Before noticing the bright plumage of the bird, or the graceful roundness of its form, I have previously observed that it has only two feet, while some other animals have four.

And this distinctive character—that first seized upon by the understanding—is not the relief, nor the colour, but the external contour, the outline, and it is all-sufficient.

Outline, then, is an artificial means of imitation; but it responds so well to our intuitive method of observing, that of the three it is the one which most rapidly proclaims things to the evidence of our senses, and most spontaneously recalls objects to our memory.

Colour is more in relation with the feelings than with the understanding, and that is why it acts upon animals more than upon ourselves, because, having the same feelings as ourselves, they have not the same intelligence.

In my next I shall speak of these three elements of imitation, outline, relief, and colour, in their complex relations, giving rise to what is termed "chiaro'scuro." We shall then be prepared to consider what position Photography holds in Art, as a means of representation.

Photographic Glossary.

Sugar — A name given indiscriminately to all bodies possessing a sweet taste, but especially to the sugar of the cane and of the beet. In chemistry this name is reserved for substances that possess the property of undergoing fermentation. Sugar of milk is sometimes employed in photography as a substitute for serum: it forms hard, white crystals, which are slow and difficult of solution in cold water.

Sulphate of Iron — There are two sulphates of iron: the sulphate of the protoxide and the sulphate of the peroxide. The first is familiar under the form of green vitriol, or green copperas, the crystals of which are soluble in twice their weight of cold water. It is a useful developing agent in photography, especially in producing positives on glass.

Sulphuric Acid — Commonly known as *oil of vitriol.* It consists of one equivalent of sulphur united with three equivalents of oxygen, and one equivalent of water. Its specific gravity is 1·84. It is a very powerful acid, and largely used in the arts. To the photographer it is valuable in preparing gun-cotton.

Sulphide of Silver — A compound of sulphur and silver, produced whenever metallic silver, or a salt of silver, is put into contact with hydrosulphuric acid, or a soluble sulphate, or certain bodies containing sulphur which are readily decomposed. Hyposulphite of soda forms sulphide of silver when mixed with the salts of that metal.

Sulphur — A well-known elementary body, which forms many important compounds when combined with other bodies, as sulphuric acid, the sulphates, hyposulphites, &c.

Sulphur-toning — Positive proofs may be toned by the action of the sulphur contained in hypo-sulphite of soda, in lieu of chloride of gold. When carefully performed, tones equal to those resulting from the use of gold may be obtained. The process is described on page 61.

Tannin, or Tannic Acid, is obtained from gall nuts, oak bark, &c.: it is the type of astringents. It is usually met with as a pale yellow powder; very soluble in water and in weak spirit of wine. It possesses the property of precipitating gelatine from its solutions, and of combining with it to form a leathery substance. On this account it has been employed in photography in varnishing proofs with gelatine, and then acting upon the gelatine with solution of tannin.

Tartaric Acid — This acid is contained in the juice of the grape. It has of late occupied a conspicuous place in photography, in connection with the experiments of M. Niẽpce de St. Victor on the action of light.

Tartrate of Silver — This salt of Silver is at first only feebly acted upon by light, but after a time it grows darker under the influence of that agent than any other salt of silver, on which account it would appear to be admirably adapted for positive proofs. But its want of sensitiveness is a bar to its use.

Taupenot's Process — A process in which the glass plate for negative pictures is coated both with collodion and albumen. It is described on page 204.

Test Paper — Bibulous paper stained with the blue tincture of litmus. It is reddened by acids; the blue colour is restored by the action of alkalies. It is indispensable to the photographer.

New Books.

How to take Stereoscopic Pictures, including a detailed account of the necessary Apparatus, and a minute description of the Collodio-Albumen, Fothergill's, and Powell's Dry Processes. By Wm. Ackland. Third Edition.

(London: Simpkin, Marshall, and Co.; Horne and Thornthwaite.)

Although nominally a third edition, there is sufficient novelty therein to entitle it to more than a casual notice. It is not intended as a mere introductory book for those quite unacquainted with the photographic art; but though entering into sufficient details to render it intelligible to photographers who have only as yet passed but a little beyond the threshold towards the higher mysteries, it contains very succinct and intelligible directions not only for producing stereoscopic negatives, but also for printing them as transparencies, &c.

There is also a choice of three dry processes offered for the selection of the amateur, all the necessary particulars being clearly given for their successful practice, and the happy medium of sufficiency without redundancy of information attained.

Powell's dry process appears to be founded on the use of a more than usually sensitive collodion of a contractile character, with a solution of glycyrrhizine as a preservative agent; but as this is not an easily procurable substance in a pure state, and the time of exposure in the camera does not appear to be shorter than for Fothergill's process, we scarcely perceive in what its advantage consists. Probably, however, those who have tried it, which we have not, may have discovered that some does exist, and Mr. Ackland asserts that the results obtained thereby are superior to any of his former productions.

Glycyrrhizine in an impure state, in the form of an extract from the liquorice root, has been used in America for the same purpose, as indicated some months back in one of our leading articles.

Irrespective of the performance to the letter of the promises held out, there are several useful hints available in many branches of photography in general; and the book may be safely recommended as an unpretending but useful little guide.

Foreign and Colonial Correspondence.

Paris, September 10, 1859.

The researches of M. Niẽpce de Saint Victor form a standing topic for photographic discussion and commentary; and if he be denied the honour of being regarded as a discoverer, few will deny his right to the title of *fermenter.* What he has said and done has certainly put the photographic world into a state of brisk fermentation. In so delicate and complex a subject of investigation as the chemical action of light, it is easy to build and easy to overthrow. In seeking to give explanations of certain phenomena, the last holds good until it is refuted by a new one, which in its turn is refuted also; so that in fact we never know where we are, nor whether we may abide by what we fancy we know.

The results obtained by M. Niẽpce are attributed, first, to the action of light. Light had something to do in producing them, without doubt; but as the same results can be obtained by the agency of heat without light, why of course it is not light, but heat. You may stop there and take breath, for a gentleman is coming along who proclaims your notion as stuff and nonsense; he can produce the same results without either heat or light—in a refrigerator—by electricity. Well, we will stop here, if you please. Oh no; you must move on, for here comes Professor Ozone, and he does not care a fig for your light, nor your heat, nor your electricity: he has got something in his pocket. Well, and so has another—formic acid. Beat that if you can. But what shall we do with the gentlemen who talk of the formation of glucose, and of the green salt of uranium? Oh, let them wait till they can explain the following experiments:—

1. Take a black and white feather and expose it to the sunshine, then apply it to sensitised paper: only the white portions will impress their image. It is the same with black and white chalk or marble.

2. Pipeclay or freshly broken porcelain, exposed to the sun's rays, and afterwards applied to sensitised paper, blackened it in the parts exposed to the sun, while the non-insolated portions produced no effect.

Many of the experiments made by M. Niẽpce have been repeated in pure hydrogen and in a luminous vacuum with the same results as in the open air.

Now it will not be easy to explain the above experiments by the solutions hitherto proposed, and we may still maintain that the phenomena of the action of light remain unexplained.

The following experiments have recently been made by M. Nièpce de Saint Victor. Two pieces of cardboard were impregnated with a solution of nitrate of uranium: one piece was put in the sunshine, and both were placed in tin tubes; then the tubes were filled with liquid starch, and at the expiration of forty-eight hours the two solutions were tested by M. Bareswil's test. That which had been in contact with the solarised cardboard gave a slight reduction of a salt of copper, and that which had been in contact with the non-solarised cardboard gave no result at all—not even a change of colour.

An experiment still more conclusive, consists in filling a bladder with starch, and suspending it in a tube containing a solarised cardboard. The result is the same.

These experiments clearly prove, that when we envelope grapes in a paper bag impregnated with nitrate of uranium, nitrate of iron, or tartaric acid, the fruit ought to mature more promptly, and contain more sugar.

Wine exposed to the sun in a glass bottle, hermetically sealed, acquires a different taste than when exposed to the sun in a metal vessel. It is thought that new wine may be ripened by exposure to the sun.

It is probable that if the wine were put into a blue or violet bottle, the action of the light would be more energetic; it would also act more favourably upon red wines than upon white.

M. Nièpce de Saint Victor has recently invented a curious and ingenious instrument, which it is expected will render important assistance in researches upon light, and is very curious in a scientific point of view. It is a *solar-pile*. Its composition is very simple, consisting of a disc of copper and another of zinc, separated by a disc of cork, and furnished at the upper extremity with two copper wires which meet together. This is plunged into a solution of nitrate of uranium and oxalic acid. Under the influence of the solar rays the liquid becomes agitated, and enters into what may be called a state of ebullition in consequence of the disengagement of electricity. The zinc is sensibly attacked and forms a precipitate, which M. Nièpce thinks is oxalate of zinc. It remains to experiment with this pile, which will be more economical than any other. J. P.

Geelong, Victoria, May 14, 1859.

Sir,—I have received only two numbers of The Photographic Journal out of five this year. In consequence of its being a semi-monthly, the number for the 15th is usually omitted. I would suggest that, for foreign circulation, they should be put up in monthly parts. The change of name deprived me of the February number, the Society's Journal having been sent in mistake, in consequence of its editor having adopted a similar name to your own. You kindly refer me to page 206, but that is in a missing number.

I am glad to see that, since your visit to the "land o' cakes," you are getting a little into my way of thinking about long focus lenses. You can inform Mr. W. Housley that, if the front lens of a half-plate combination is not long enough in focal length, he has only to take it out and employ the back lens, removing the middle ring, and turning the plane face towards the object, use a suitable diaphragm, attaching it to a tin camera with a pair of double backs, and he will have an excellent achromatic view lens of long focus. At least mine was, that I sold to buy a crown grant for 13½ acres of the Ballarat Gold Fields, which is no doubt the best speculation that has been made with a half-plate camera. And the same lens, mounted in a tin tube with a good eye-piece attached, will make a splendid telescope.

I see that you accuse me of ignorance for proposing a non-achromatic lens. I have only to remark that I am as well acquainted with the theory of optics as most persons who have not reduced it to mathematical calculation. Your remark in the Glossary, "it is even asserted that it is impossible to make the chemical and visual foci coincident, except for one given condition," rather proves my statement to be correct, coupled with the proof in the pictures, and we have a way here of judging the quality of kangaroo tail soup by its flavour.

I am glad to find large pictures are being taken with long focal length lenses, and have no doubt that dry plate negatives can be taken instantaneously and reduced as quickly as a positive portrait in the wet way, and from my experience say as well.

Next, I have to remark that our motto is "Advance, Australia!" but in the "Letters to a Young Photographer" the writer has omitted M. Gaume's gutta percha process, which, in my opinion, is the greatest discovery in paper photography since Mr. Jordan's application of the rod and the double iodide solution, and will, I think, make glass quake for negatives, its advantages are so great: first, the paper does not buckle under the rod, it dries in a quarter of the time, the pictures are on instead of in the paper, and the outlines are sharp; it allows the nitrate and hyposulphite to be washed out easily; in fact, it's *the thing*. But the benzole must be well *dried out* before the albumen is applied.

Next, I wish to propose to the photographic world the use of india rubber instead of gun-cotton, a desire being expressed for some other substance. I took pictures with it in the year 1850. I dissolved it in benzole, but it would be better no doubt in ether, and it has been added to collodion and found to answer for surgical purposes, I think it may answer for astronomical and microscopic pictures.

I also wish to propose the use of the fluoride of silver as a bath. Many years ago it was introduced as an accelerator, but from its properties I think it was not used rightly, the salts with which it was associated are not soluble salts, viz., iodide, bromide, chloride, &c. Hardwich says it produces a soluble salt with silver, and if so it dissolves out,* it should therefore be used as a bath. Some photographers have solicited ideas, I throw out this one, and if it be approved I shall be glad to receive communications on the subject of the *modus operandi* pursued. I propose to use in atomic proportions fluoride of soda or potassium and nitrate of silver, as a bath; a field is then open for investigation as to the insoluble salts best in the collodion, as it is not probable that the same salts as are used in collodion for the nitrate bath would be applicable to the fluoride bath.—I am, yours, &c. ANTIPODES.

[Not so fast, good friend; our opinion being based upon some knowledge, practical and theoretical, of optical matters, is not so easily changed, in fact it remains just the same as before. In a *well-constructed* portrait lens, the back combination ought not to have any plane surface, but should consist of a bi-convex crossed lens of crown or plate-glass, and a concavo-convex of flint glass, the concave side being turned towards the convex lens. Now, by a removal of the ring, it would be impossible to bring the concave side of the flint lens outwards; and in fact it is totally unfitted for landscape purposes, by which observation we do not mean to assert that no picture can be taken by it, any more than we did with a non-achromatic lens, but simply that *good pictures* cannot be taken therewith as a rule, and never equally good in all respects as *can* be obtained by a lens specially constructed for the purpose. We have an English motto, "slow and sure," and we have had no *glass-quake* here. The conversion of the free nitrate of silver into a fluoride has already been proposed, but the method suggested by our correspondent is inapplicable.—Ed.]

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

EXPERIMENTS IN PARALLEL DIRECTIONS.

To the Editor.

Sir,—Charles Lamb, if I recollect rightly, in one of his admirable "Essays of Elia," categorised mankind into two great classes, "those who borrow and those who lend." Had the "gentle Lamb" lived in these days of photography, and perused the pages of The Photographic Journal, we can almost certify that his pen would ere this have produced some amusing articles on photographers in general, and we could venture to guess under what facetious title the present number might have elicited his good humour.

Though Charles Lamb has long slept with the dead, his classification remains for our edification, and it appears in daily life we must succumb to the division; but when a man finds that he is reckoned in the first class, and knows that he is thereby personally wronged, he must either sit quietly under the error, and say, with the Turk, "Allah kerim!" or attempt to recover from his false position. Most, I believe, whose hearts are not wholly wrong, endeavour to state their justification before their friends. In my own case—thanks, Mr. Editor, to you—so able a defence has been already set up that it is scarcely worth an attempt to strengthen the position; and I certainly should refrain from occupying a space in your Journal, if there were not such a *personal* accusation and misstatement in the letter of your correspondent, signed "C. J. Burnett," that to let it pass without remark would be tantamount to admitting a charge of gross plagiarism. I can hardly suspect that the gentlemanly and polite

* Fancy adding nitrate silver to the bromide, iodide, and chloride, as an accelerator; it is a case in point.

rebuke contained in Mr. Glaisher's reply, published in your Journal of August 15th, and originated under almost similar circumstances, has been perused by Mr. B; but if so, it has signally failed to conduce to his equanimity of temper. Old habits are not so easily changed as our garments, and a brush on the latter may remove the dust, but the stains remain.

It seems that your correspondent is determined to walk the world alone, or to dispute indiscriminately with those who take the same path; and his surface appears to have become so irritable by the fumes of the laboratory, that both Mr. Hannaford and myself, quite unintentionally, have deeply tested its sensibility, and which, from the developing liquid used by Mr. B. containing some impurity — perhaps in the *acetic acid* — has stamped a strong image of our labours, though in my case over-development has somewhat fogged and stained the picture; so that neither on the ordinary printing paper, nor, I fear, on "uranium" prepared, nor any other "allied" papers; nor by any other "allied substances," nor by any other "allied processes," is the print preserved with the lights pure, the half-tones harmonious, the shadows soft: in fact, the tone is faulty and the picture sadly defective from its want of truth.

Mr. Burnett accuses me of having filched from his pamphlet the recommendation of paraffine, &c., *vide* p. 212 of last number. Let me, for my own justification, positively assert, on the veracity of a gentleman, that to my best belief *I have never seen nor in any way made use of his pamphlet;* indeed, from the style of the articles lately sent by him to your Journal— and the graceful tone of the letter and its lengthened postcript — I should be induced to studiously avoid ever ordering the same from my bookseller, even at the risk of occasionally experimenting in parallel directions with him.

The use of paraffine oil arose thus:—Passing, about the end of June *last year*, in Regent Road, a shop, then lately opened for the sale of lamps and paraffine oil, and knowing something of its properties, I walked to the nearest chemist's shop, purchased an empty bottle, and returned for some of the oil. It was at once tried in various ways for photographic purposes, and eventually used as stated in my first communication — its disagreeable smell having also suggested the addition of benzole. I have many negatives taken shortly after. Now this does not quite rest only on my own veracity, as several friends used to see the results. On entering the house and approaching my working room, they used to say, "O there is Maddox at his photography again!" from smelling the paraffine some steps away.

In that process, among others, I also employed for sensitising, the formula recommended, as far as my memory served, by Mr. Sisson. This was noted in my communication to you, and, if needed, might be employed as a further argument that I am little desirous of detracting from any man's merits, not even from that of the author of "allied substances." What is the truth of the matter as set out in your Journal? —I have no other guide.—That I was using paraffine oil *ten months prior to the publication of the fertile pamphlet from which I am accused of abstracting without acknowledgment*, which, it appears, claims solid paraffine dissolved in alcohol.

Had I then rushed to your arms, you might have saved me, Mr. Editor, from such a painful weight of blundering, or being crushed by such a heavy chain of reasoning and invective. Had my experiments on the paper process begun yesterday, depend on it I should have hesitated to send you the result; but as they began in the intervals of an arduous practice abroad, shortly after the publication of Le Gray's *Nouveau Traité de Photographie* of 1851, they may save some of the imputation which, if couched in more gentlemanly language, would not have been ignored. If Mr. Burnett desires to preserve his labours intact for some posthumous work, silence should be his safeguard; or if he would be classed among those who like to enjoy the sunny side of a scientific reputation, let me try to persuade him to dip his pen in some one else's toning bath, and soak his papers longer in the cool waters of discretion, before he sets up as a photographic usurer, from whom we should all feel proud to borrow and pay with the interest of every honourable acknowledgment.—I am, yours, &c. R. L. MADDOX, M.D.

Woolston, September 1, 1859.

THE MAGIC LANTERN AND PHOTOGRAPHIC SLIDES.

To the Editor.

Sir,—Having a magic lantern, and wishing to apply it to photographic sliders, or rather they to it, I take the liberty of asking your advice.

The condensers are convex and plano-convex, three inches diameter. I have taken the front lenses out, and substituted a quarter-plate portrait combination, one and three quarter inches diameter. Not getting the resulting picture large enough, I next tried a half-plate lens three inches diameter, with I think worse results. I then took the front lenses out of each combination, with no better result. Is it compulsory for the condensers to be both plano-convex, and to be four and a-half inches diameter, as Mr. Hislop in a back number of The Photographic Journal recommends? The lamp is a patent Argand.

If you think I shall not succeed with the above condensers, do you think Mr. Hislop's is a good plan, and will it succeed in the hands of the non-genius? I am, yours, &c. J. R.

Liverpool, August 25, 1859.

P.S.—I have inquired the price of the two plano-convex $4\frac{1}{2}$ lenses; they are fourteen shillings. Do you consider the light strong enough?—J. R.

[The size of your condensing lenses is not of so much importance as regards quantity of light as area of the slider illuminated. With three inch lenses you cannot expect to use sliders of more than about one and three quarter inches square.

A quarter-plate portrait combination would answer well as an object glass, provided the room in which the lantern is to be used is *long enough*, but in an ordinary room there is not sufficient distance to give the requisite enlargement with such a lens, in which case it requires one of *shorter focus*, for you must remember that with a limited distance between the screen and object, the *largest* image is produced by the *shortest* focussed lens, as in a microscope; but bear in mind also that the amount of light is diminished in equal proportion. Direct your attention to obtaining a good light. If you employ an oil lamp, a lump of camphor dissolved in the oil materially enhances the illuminating power.—Ed.]

ANSWERS TO CORRESPONDENTS.

C. B.—Timon.—See our leader in the present number.

A. P. — You will be sure to get it at Horne and Thornthwaite's.

Medcalf.—See our article on the solar camera, and refer to the papers therein cited.

E. Strochan.—Your conjecture is correct. See answer to "A. H. B.," page 208.

Thos. Parkinson, Jun.—We cannot do so. Our time is too fully occupied to permit it.

Saml. Barkworth.—Thanks for your kind suggestion, but we prefer to be sought rather than to seek.

Amicus.—You can procure Mr. Russell Sedgfield's productions from Mr. Bennett, Bishopsgate Street Without.

J. A. Church (Norwich).—We strongly recommend a trial of the plan for paper photography published in our last. In our opinion it is one of great promise.

Subscriber (Colchester).—An over-acid bath produces a very *weak* picture, and demands a protracted exposure of the plate in the camera, in order to produce an impression at all.

Gin and Water.—We have had a "Windsor soap process" sent to us, but only in a joke from a frequent contributor; it was proposed as an infallible method of obtaining *clean* pictures; so that your "soft soap" would be "flat, stale, and unprofitable."

T. Allpress, Jun. — We have several times within the last twelve months given details of the method of working the honey process, which it would not be fair to our readers to repeat again; we must therefore beg you to refer back, when you will find all the information you require.

One who Approves. — We have always endeavoured to set forth the truth regardless of interest; in fact, we have no interest personally but in ascertaining truth. We are not, therefore, about to begin now to take a different course. We say with the knights of old, "God defend the right."

Robert Lomore. — Your experiment has most probably failed in consequence of your having performed it at *too low a temperature.* When a particular degree of heat is mentioned as a necessary element towards a successful result, it is important to consider *what scale* has been intended to be understood for the reckoning. Most French writers refer to the centigrade and not to Fahrenheit's thermometer, when alluding to temperature.

To convert one into the other proceed thus: —

Multiply the number of degrees on the centigrade scale by 1,8, and to the sum add 32, which will then show the corresponding degree upon Fahrenheit's scale.

Thus, $60° \times 1{,}8 = 108 + 32 = 140°$—so that you have been working at far too low a degree of heat.

To convert Fahrenheit's scale into that of the centigrade, of course the converse holds good, viz. — deduct 32 from the amount given and divide the remainder by 1,8.

Rationale.—It is supposed that the actinic rays effect a reduction, more or less, of the silver salt, by the abstraction of oxygen. The free acid yields a supply of oxygen, hence the difficulty of abstracting it from the silver salt in presence of free acid. It must however be admitted, that chemists have not sufficient real *knowledge* on the subject to speak with absolute certainty, and that much is conjectural of what is received as explanation.

To acidify a neutral bath of nitrate of silver for collodion *positives,* just sufficient *nitric* acid to cause litmus paper to become decidedly red is preferable — say about one drop of acid to ten ounces of bath; but for negatives, *acetic* acid is best in our opinion. In this case, if the test paper assumes a *warm purple hue* it is enough.

The nature of the collodion used should be taken into the account. Some kinds show an alkaline re-action, and these require an unusually acid bath; others contain free iodine, and then the bath may be neutral with advantage.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 103, Vol. VI.—OCTOBER 1, 1859.

In our impression of the 1st ultimo we directed special notice to the intention contemplated by the managers of the Art Union of Manchester, of giving as some of the prizes in the ensuing distribution bound volumes of choice photographs. Our attention has been drawn to the fact that there exist at the present moment two separate bodies, bearing designations almost identical — in fact, quite so in idea, the words being simply transposed. On reference to our remarks it will be seen that we regarded *The Art Union of Manchester* and *The Manchester Art Union* as one and the same association; but we learn with no little surprise that this is by no means the case: the former being that from which the advertisement published in our pages emanated, the latter being the original body, with which the Art Union of Manchester has no connection whatever. We learn, however, that Mr. James Law, the Secretary, who is responsible for the advertisement, was formerly connected with the original body. We know nothing at all about the particulars of the rupture, if rupture there has been; but our attention having been drawn by private connexions to the fact of there being "two Richmonds in the field," we consider it a point of duty to advise our readers thereof, in case any of them may have been inadvertently misled by our observations.

To an inquiry relative to the morality of a *double entendre*, it was replied, that "if a man means *well* the more he means the better." So say we relative to these two bodies; but at the same time we cannot but think that more good would be likely to arise from their union than their separation.

In consequence of the hints we received we have made inquiries relative to the position of the older association, and find that it is not in active operation this year, but that it is about being remodelled on a more extensive and permanent basis, and is expected to reappear next year under very favourable auspices, and with strong claims to support. We trust that photography will not be lost sight of in the new arrangements.

One of the manipulative obstacles alluded to by our contributor Dr. Maddox, in his recent paper, is that of obtaining readily an even film of albumen. A similar annoyance has occurred to others of our subscribers who have wished to procure albumenised paper by formulæ not commonly adopted, or on paper of a kind not usually kept in stock by the dealers in photographic materials: we therefore propose to throw out a hint or two relative to the preparation of albumenised paper.

Many photographers, amongst the amateur section, take great pains to procure new-laid eggs only: we believe this to be a mistake, and are convinced that ordinary shop eggs, provided they emit no offensive odour, answer just as well if not better. However that may be, the whites having been separated carefully from the yolks, without the membranes enveloping the latter having been broken — to insure freedom from accidental contamination with which, each egg should be broken separately in a cup — the requisite quantity of the albumen should be placed in a wide-mouthed clean bottle: one such as is employed for preserved fruits or pickles answers the purpose well enough.

To each ounce of albumen add ten minims of liquor ammoniæ, and also such quantity of chlorides, bromides, iodides, or mixtures thereof, as may be desired, they being first dissolved in water sufficient to effect their solution. Cut up a sheet of thick writing paper into small pieces about half an inch square, and put them also into the bottle with the other ingredients; the cork or stopper is then to be inserted, and taking the bottle in both hands, the contents are to be well shaken up for half an hour, or until the whole is in a state of froth. It is then to be allowed to repose until the following day, or at any rate for several hours.

An ordinary photographic dish being filled with the prepared albumen, by pouring it gently from the bottle into a glass funnel, having a piece of clean muslin disposed as a filter, and the beak of the funnel *resting on the bottom of the dish* to avoid the formation of bubbles, the paper is to be floated thereon in the usual way, and allowed to remain until the edges cease to curl up. The requisite time will vary materially with the kinds of paper used. English papers being generally harder and more stiff than the foreign kinds, owing to the difference of the sizing material, are easier to manipulate if held over a dish containing hot water *just before* floating, both sides of the paper being exposed to the influence of the steam for a few moments.

When the paper can be removed from the surface of the albumen without violently curling up, it is to be lifted by one corner and allowed to drip for a few minutes, steadying it in a vertical position by holding also the adjoining corner with the other hand. After dripping for about a minute from one corner, the hand that steadied the neighbouring angle to that by which the paper was suspended is to be gently raised, so as to become in its turn the suspending corner, which proceeding will cause the albumen to flow off from a different corner to that whence it first dripped, the flow being now at right angles to its former direction. After a few seconds — say half a minute — bring the corner next in succession to the highest point, and finally the fourth corner upwards, taking care that each one comes uppermost in *regular succession*, so that the drip has flowed from each of the four corners.

If the operation above described has been correctly performed, the paper will now be coated on the surface with an even film of albumen, scarcely flowing at all.

The great point to be aimed at is to *keep it* in the condition it now presents — that is, an even brilliant film; and to this this end rapidity in drying mainly conduces.

The American wooden clips are extremely convenient for suspending photographic paper while drying, particularly if a common pin be thrust at its upper end, through one piece of the wood of which the clips are made, and bent into the form of a hook.

By attaching two of these clips to a sheet of the paper, the whole can be suspended in a vertical position from a cord. By placing a couple of chairs, one on each side of the fire-place, and stretching a string from one of the backs to the other, a convenient line of suspension is formed. The paper should be hung with the *plain side* towards the fire, and as close as possible, so long as scorching is avoided. In about a couple of minutes the drying will be complete, and the surface should be smooth and brilliant, provided that the manipulations have been correctly performed.

We regret to find that a neglect of the usual courtesy of acknowledging the source of reprinted articles is apparently gaining ground in some periodicals. We were not a little surprised to notice in the number of *La Lumière* which was published on the 27th of August last, a translation, very slightly altered, of the paper contributed by Dr. Maddox, which had previously appeared only in our columns — our surprise not being excited by the reproduction of the paper, but by its being acknowledged as copied from the *Moniteur.* As the editor of *La Lumière* (a French photographic periodical) is always supplied with a copy of this Journal it is but reasonable to suppose that he must have been aware of the fact that the article in the *Moniteur* was not original, even if so professed. However, in order to prevent any question on the subject, we addressed a note to M. E. Lacan, the editor of *La Lumière*, drawing attention to the fact; but as he has taken no notice thereof, we presume that he approves the proceeding. If so we are extremly sorry that such should be the case, for we have hitherto regarded the publication in question as holding a position that such a course could only degrade.

We find also the same article copied into *La Revue Photographique*, but without any acknowledgment at all.

We fear that it is undoubtedly true that some English and American Journalists may have acted towards our French contemporary in the same manner as that of which we complain, but it is a proceeding that should be unquestionably discountenanced. An extract acknowledged is a compliment — unacknowledged it is an insult. What a pity that the omission of a few letters should be allowed to work so important a change for the worse!

From the numerous inquiries which we have from time to time received, both from professional and amateur photographers, for advice relative to colouring their productions, we cannot avoid being aware that the subject is one of considerable importance to many of our readers. Personally we have been unable to afford any assistance in the matter, being totally unaquainted with the practical part of painting; but we can scarcely regret it so far as our subscribers are concerned, because our own want of knowledge has been the cause of obtaining for them a more lucid and genuine set of instructions, as to the best method of proceeding, than has hitherto been published in any form. The more practical parts of the series are still in course of publication. The author is an artist of considerable reputation, actively engaged in the pursuit of his profession; and he has most liberally offered to enhance the value of his communications by affording advice through the medium of this Journal to those desirous of obtaining it, and criticism upon the essays of those who may be reducing his instructions to practice. To this end, specimens may be forwarded to Alfred H. Wall, Esq., 11, The Terrace, Walworth, accompanied by stamped directed envelopes for their return. As the necessary advice and criticisms will be published, it will be as well for each applicant to assume some pseudonym — for the truth unadulterated, though very wholesome, is not always palatable.

We are sure that all who have seen the productions of Mr. Wall will most readily appreciate the value of his advice and the generosity which dictates his kind offer.

OBITUARY.—Mr. ANDREW ROSS.

It is with sincere regret that we notice the decease of Mr. Andrew Ross, the well-known and deservedly celebrated optician, whose name is familiar not only to most photographers, but also to men of science generally, whose pursuits demand the use of optical instruments of a high character.

Our personal acquaintance with him commenced some sixteen or seventeen years ago, but his reputation was well known to us several years prior to that time.

Mr. Ross was not merely a manufacturer of optical instruments, but *an optician* in the most extended sense of the word; one who thoroughly comprehended the laws of optical science, and was as well versed in the theoretical as in the practical details of his calling. He was a clever mathematician, a cautious and careful observer of all phenomena bearing upon his occupation; not easily induced to adopt any novelty until he had well considered it from every possible point of view, and it was then only from a thorough conviction of its advantage that he finally took such into favour

He was slow in admitting the commercial importance of photography, hence he was not induced without considerable difficulty to embark in the manufacture of photographic lenses; and it was only by the continued perseverance of his son, Mr. Thomas Ross, that he was at last persuaded to bring his extensive optical knowledge to bear upon the subject.

To him scientific men are indebted for many valuable improvements in the telescope, microscope, and in the optical parts of photographers' apparatus. In his endeavours to overcome difficulties connected with any one of the classes of instruments named, he not unfrequently hit upon a principle specially applicable to another, and thus each in turn received benefit from his attention to those allied.

It is now about thirty years since he first settled in London, and his career commenced by his constructing a very accurate dividing engine, for producing the scales on astronomical and other scientific instruments. By the introduction of Mr. Solly, he constructed for Mr. Valentine a microscope of a much higher class than any that had been hitherto attempted — the optical parts consisting of doublets and triplets — and for this he received from the Society of Arts the Gold Isis Medal, and the sum of fifty guineas; but his great fame was due in the first instance to the excellence of his productions in connexion with the Achromatic Microscope, and the article "Microscope," in the *Penny Cyclopædia,* was written by him.

Early in the year 1831 a microscope was constructed by Mr. Andrew Ross, based upon the important discovery made by Mr. Joseph Jackson Lister, and communicated to the Royal Society in 1829, relative to the means of correcting the aberrations of microscopic achromatic objectives, and from that time the value of this instrument as a means of *scientific* research takes date. So rapid afterwards were the improvements he effected in the construction of microscopic lenses, that the errors of sphericity and dispersion were balanced to that degree of perfection that merely covering the object to be viewed with the thinest piece of glass (then about the two-hundredth part of an inch in thickness) was sufficient to disturb the corrections. This peculiarity was first detected by Mr. Ross; but he no sooner discovered it than he applied a remedy, the particulars of which he communicated to the Society of Arts in 1837, and for this important discovery and clever correction he again received from that body the Gold Isis Medal.

In the year 1837 Mr. Andrew Ross was again presented by the same society with the Silver Medal, for his invention of the Sphœrometer, an instrument adapted for the determination of the radii of curvature of lenses, especially of the smaller kind, these being by far the most difficult to ascertain correctly.

In the construction of refracting telescopes, whether for astronomical or terrestrial purposes, Mr. Ross was equally eminent, and his name attached has always been regarded as a certificate of excellence. In fact, some of Mr. Ross's astronomical telescopes have been said to surpass any others. In the production of these instruments he was assisted by his son-in-law, Mr. J. H. Dallmeyer, a native of Prussia.

It is however in connexion with photographic lenses that our readers will recognise Mr. Ross's chief claim to their regret, and rightly so, for from the very earliest rise of our fascinating pursuit he was in constant communication with those who have been the pioneers for smoothing and removing the optical difficulties that beset the paths of photographers. Many of those difficulties have been overcome altogether, some have been palliated, and others still remain to be vanquished.

In this branch of his business he was assisted by his son, Mr. Thomas Ross, who, as we before remarked, was the means of at last almost compelling his father's attention to photographic optical requirements, and the management of that department was very naturally confided to the son; in fact, for the last nine or ten years that branch may be said to have been entirely under the control of Mr. Thomas Ross, of course aided in the scientific part by the talents of his father.

The first photographic lens sent out by Mr. Ross was for a lady, Mrs. Massy; it consisted of but two lenses in contact. The next was made for the great promoter of English photography, the Honourable Henry Fox Talbot, and here, at the suggestion of Mr. Thomas Ross, the lenses were separated somewhat, he having noticed the additional "flatness of field" produced by the separation of the components of the "Ramsden's eyepiece." But in this as in a third lens made for Mr. Henry Collier the curvature of field was such as would not be endured now for a moment; and in order to overcome the difficulty that was then regarded as nearly insurmountable, *the damp sensitive paper was pressed between two glasses ground to the requisite curvature.*

Of course photographers know well enough that this defect no longer exists, thanks to Professor Petzval, to whose talent we all owe the portrait lens as now generally made—though by the way, many do not know this fact, the learned professor's name being more often solely connected in imagination with the orthoscopic lens. It was from seeing one of Professor Petzval's portrait lenses, made by M. Voigtlander (the father of the present one), that Mr. Ross went to work in the same direction—not by any servile copying, but by examining the principles upon which it was formed, and bringing his practical knowledge to bear upon it. The first landscape camera and lens made by Mr. Ross is now in the possession of the Rev. J. B. Reade, and his first portrait combination in that of Mr. Fox Talbot, for whom he also constructed a lens for enlarging from negatives, calculated expressly to increase to the extent of four diameters.

The operation, though not well adapted for paper, was however found to answer with daguerreotype.

At the Great Exhibition of 1851 he received for his photographic camera and double combination lens the Council Medal, and also for his labours in assisting the jurors an Assistant Juror's Medal.

In Mr. Ross's decease men of science have sustained a great loss; and photographers, though they will feel it less than others in consequence of his son filling the gap in their behalf, have been severed from one intimately connected with the rise and progress of their engrossing pursuit.

ON THE PARAFFINE-PAPER PROCESS.

By R. L. Maddox, M.D.

If, on perusal, you should find the following remarks of any importance as a continuation to my previous communications on the use of paraffine waxed-paper, may I solicit the favour of their appearing in your Journal. The interest you have shown on the subject, and the attention you think it to merit, have induced me to continue my experiments, and I trust not without some progress.

In the previous formulæ, bees'-wax had been used; but Mr. Jennings, chemist, Southampton, having handed me some *Japan vegetable-wax*, which is said to vary considerably in chemical constitution from the former, though possessing closely allied physical properties, I determined on giving it a trial in conjunction with paraffine oil, anticipating an advantage in the reduction of the silver salts by its use.

Some ordinary paraffine oil was filtered through well-dried animal charcoal; to each ounce twenty grains of the vegetable-wax in shreds was added, aiding the solution by setting the bottle in hot water; also five grains crushed iodide, and one grain bromide of ammonium—no free iodine being used. Papers already albumenised by your formula were soaked for twenty minutes in the filtered solution, dried and sensitised by the formula originally given, which, as an error occurred in the quantity of nitrate of silver, I here repeat corrected.

Dissolve forty grains of nitrate of silver in two drachms of distilled water, add one grain of bromide of potassium, shake well, then add gradually ten drachms distilled water, four drachms Beaufoy's acetic acid, and four grains citric acid. Filter for use. The papers were floated on this until they rested quite flat and appeared nearly uniform in colour, then treated similarly to the former papers.

The first negatives were sent for your inspection. I found the papers thus prepared possessed of much greater sensibility to light as compared with those prepared with bees'-wax: dry, they afforded negatives on three seconds' exposure to sunlight with a double combination lens when treated by the quick method of development, though by the slow method they gave no image; but thirty seconds' exposure gave dense negatives with the gallic acid developer.

A piece of paper thus prepared was placed over a negative which had been taken by four seconds' exposure in shade, with Mr. Jennings's negative collodion (which, by the way, I mention as excellent for the dry process, being exceedingly rapid, and giving good density), and gave, on instantaneous exposure to moderate light, a positive by development on immersion in solution of aceto-sulphate of iron. This experiment was repeated many times, varying the exposure and strength of the solution: some essays gave excellently toned pictures, but often before I could remove them they became dingy and discoloured. This led to the use of a double salt of sulphate of iron and magnesia as a developer, with the addition of citric acid, but it only produced red pictures, which *were not stable* in the hyposulphite solution, turning purple all over after the use of honey, though in the developer the whites were well preserved. I should however observe that it was placed in the same hyposulphite bath as those negatives developed with gallic or pyrogallic acids, hence the tint, I suspect.

When carrying out with the camera some comparative experiments on the sensitiveness of papers prepared with bees' wax, and with Japan vegetable-wax in paraffine oil, on trying to develope one of the pictures by pyrogallic solution, so tardy was the development that I concluded that the slide must have been forgotten to be drawn up, especially as I was temporarily surprised by a young cow rushing towards me with somewhat of wilfulness; so on not seeing any vestige of a picture after the usual time, I washed off the pyrogallic solution, pulled the paper several times through water, and set it aside in blotting-paper for future use. On removing it next day I was surprised to find the picture developed and very fairly out, the paper being perfectly dry. To try and continue this development it was wetted, the blotting-paper damped, and again set aside—the density increased but little; afterwards it was soaked in honey and water, as you suggested, but it scarcely altered. It had been exposed thirty seconds in sunlight. Another negative was taken on similar paper, exposure the same, developed by the pyrogallic solution until fairly visible, then washed in water and in honey and water, and set aside like the previous one, as also one developed by the ferro-sulphate of magnesia. They darkened only in a trifling degree. After five days they were each put in hypo solution, and I now forward these with others.

Continuing the experiments with Japan vegetable-wax, I tried the effect of lamplight to print by. Prepared paper was placed under the previously-named negative, and exposed for twenty minutes near a moderator lamp: no image visible. It was left all night in previously used gallic acid solution, and you will find it amongst the rest of fair intensity. Indeed, to prepare many of the papers by candle-light, I fear I have to attribute a considerable number of apparently overdone pictures, though generally the light was protected by yellow paper.

The question is still open as to the best solvent for the Japan vegetable-wax, which by Sthaner is said to differ considerably from bees'-wax—"double the quantity of oxygen and palmitic acid combined with the oxide of glycocyle." I have papers prepared with it in other solvents combined with paraffine oil, but hitherto have not found the sensitiveness equal to those prepared by the plan given above; nor have I found free iodine of much use in the solution, nor sensitising both sides.

It appears that the papers, when compared with bees'-wax prepared papers, are more readily impressed by light both in time and quality; and I believe that vegetable-wax greatly assists in carrying on the molecular change first determined by the action of light, though how much may be due to the paraffine oil I cannot say; for from former experiments on silver solutions with paraffine oil, connected with the reduction of metallic silver, I was induced to continue its use in combination with some hydro-carbon in the paper process. It seems worth further trial. I have not yet used

the papers damp, but purpose doing so—also after treatment with honey or some deliquescent salts. The papers unfortunately thus prepared are very stiff and parchment like, especially when albumenised, and require close pressing to the glass of slide.

Trusting your superior knowledge in matters of photography may suggest some useful modification, I leave the subject in your hands for such remarks as you may think valuable or necessary. In conclusion, allow me to thank you for the assistance you have already rendered by calling attention to the subject, with the addition of very useful hints in the pages of The Photographic Journal.

September 19, 1859.

[With regard to the use of honey and water for the purpose of continuing the slow development which appeared in the manner described by the author of the preceding paper, it does not appear from his account of the operation that he added any free *nitrate of silver* thereto; that we consider absolutely requisite, in order to obtain an adequate effect—though a very small quantity should be sufficient — probably a drop or two of a twenty or thirty grain solution.—Ed.]

WOODWARD'S SOLAR CAMERA.

We are always ready to afford every opportunity of expressing their sentiments to those who differ from us in opinion, and are not over particular about allowing personalities directed solely against ourself to appear — consequently we readily give admission to the following :—

WOODWARD'S SOLAR CAMERA.

To the Editor.

Sir,—Having read your long and disparaging account of the above-named instrument, wherein you give your own ideas and plans how something better may be constructed, allow me to say some little on the same subject.

There are numbers in this country who have made contrivances to enlarge photographs. Six or seven years back I made an instrument by which I could considerably increase the size of a photograph, and from all I have read or seen, it is the nearest approach to Mr. Woodward's solar camera. This instrument I sold to an artist in this town, who has used it ever since, until he saw the American camera, which he pronounced perfection, and now uses no other.

The arrangements you describe I have tried long since (?), excepting with an orthoscopic lens: those who may be induced to try that, with any other of your arrangements, will (like me) experience expense, loss of time, and certain disappointment.

You seem disposed to write it down simply because Mr. Woodward has patented it. You cannot have the slightest knowledge of the scientific construction, or wherein it outsteps all other contrivances.

This instrument took Mr. Woodward, not days or weeks, but years to perfect it, as it now is given to us. This useful and beautiful instrument well deserves to be protected by a patent. It certainly met with similar opposition in America; many claimed to be the inventor, but, like me, they knew nothing of its construction or worth. The result is, in America every respectable artist has Woodward's solar camera. So it will be in this country ere long. I can give you a host of names that will certify to its usefulness and perfection. Even young as it is here, many who were hostile now possess it.

You say you saw Mr. Kilburn's instrument, and the pictures taken by it, which you pronounce inferior to those by Mr. Wenham. All this is possible. We all consider Mr. Kilburn a very clever artist, and would expect something good from him. An allowance must be made—Mr. Kilburn has but just received his camera, and, from his other business, he may not have had time to perfect himself in the working of it. It will be seen yet that he can produce good and satisfactory pictures. I know what I can do myself, and I am confident he can and will do the same. I am able to produce life-size pictures, with a quarter-plate portrait lens in connection with the solar camera, by sun-light, in two minutes, such as require no artist to retouch. I will increase in length a straight line on the edge of a half-plate picture to twelve or more feet, free from the slightest distortion. I cannot believe that any of the plans you have given on Mr. Wenham's method can come near this.

I challenge all the photographic world to produce a picture that can bear the slightest comparison to one I can produce by Woodward's solar camera.—I am, sir, yours respectfully, JOHN ATKINSON,

Liverpool.

With regard to our correspondent's observations relative to Mr. Kilburn, we have only to assert that the latter is quite able to use *effectually* either the camera in question or any other photographic instrument.

As to whether a portrait requires touching by an artist or not before a purchaser would be content with it — is it not a matter of opinion?

Our correspondent seems to ignore the fact that we take exception to Mr. Woodward's camera because it is *identical* with Mr. Wenham's method, and consequently *not new*. If the one can produce a perfect picture, why so must the other.

We of course pass by without remark the charge of our alleged want of knowledge of the principle of Mr. Woodward's camera; but take leave to remind Mr. Atkinson that our comments upon the subject were elicited by his own and Mr. Woodward's previous letters. We had purposely avoided going into the question from a fear lest we should be called on to condemn—a fear arising from what we had read of the construction of the camera in the pages of some of our contemporaries; but as the subject was brought prominently under our notice, we could not do otherwise than we have done. So long as we have the honour of conducting this or any other periodical, we mean to express our honest convictions without favour or affection. We will not go out of our way to express an unfavourable opinion; but when invited or otherwise called upon to express one, it must be an honest one.

We now append the following on Mr. Atkinson's side of the argument.

A COLOSSAL PHOTOGRAPH.

To the Editor.

Sir,—My first trial for a photograph of large dimensions has been successful.

I have printed by the developing process, on Saturday, September 10th, a full length and "sharp" image (portrait) on an entire piece of calico, of eight-and-a-half by five-and-a-half feet. I was obliged to stop the printing three times, as the sky was cloudy and the sun not strong, but finished the printing in about ten minutes.

I have printed about forty in the last fortnight, all on large-sized smooth Whatman's paper; they are nearly all successful, and are now exhibited in my new gallery for life-size pictures.—I am, yours, &c.

Havelock Buildings, Bold Street, P. C. STORTZ.
Liverpool, September 19*th*, 1859.

We have yet more to add — but enough for the present.

British Association.

Aberdeen Meeting, September, 1859.

(From our Special Reporter.)

As this Journal is essentially a photographic organ, it is not our province to notice the papers on general Science brought before the various Sections. The scope of our art lay within the proceedings of Section A (Mathematical and Physical Science), and Section B (Chemical Science).

One or two circumstances, however, gave special interest to the Aberdeen Meeting, to which we may devote a small space before passing on to the strictly photographic part of the subject.

In the first place, the presidency of H.R.H. the Prince Consort gave an *eclât* to that meeting that in a pecuniary sense made it the most successful one in the history of the British Association, the members and associates numbering nearly 2600 (a number unprecedented in its now long career), embracing the high-born in station and the distinguished in Science, Art, and Commerce. The Continent of Europe was ably represented in its men of genius, and America sent some of her most distinguished *savans*. Even Syria had its representative in Mr. Antonius Ameuney, who delighted Section E with a paper *On the Arab Speaking Population of the World*—no less by the broad and enlightened views which he enunciated than by his thorough knowledge of our language, which enabled him to lay his statements before his auditory in a perfectly clear manner, while his finished style and ready wit gave point to his address.

Another source of more local interest which marked the late meeting was the inauguration of the very elegant Music Hall, in which took place the *conversazioni* and general lectures. Among the many fine buildings of which the "Granite City" can boast the new County Buildings, to which is attached the Music Hall, will take high rank—not only for the chasteness of the architectural style, exterior and interior, but for their perfect adaptability to the special purposes for which the whole have been designed. The acoustic properties of the great hall reflect the highest credit on the architect, and its appearance upon the late occasion, when filled with the rank and beauty of the surrounding country, was light, elegant, and graceful. Nor has the important point of ventilation been overlooked, as was proved by the moderate temperature of the building when filled to overflowing during the

recent meetings. The possession of this noble Hall and the splendid suite of rooms attached, gave to the local authorities and officers of the Association "ample room and verge enough" for the purposes indicated above, which the British Association we believe nowhere else enjoyed to the same extent, except in St. George's Hall, Liverpool. The meetings of the various Sections took place in the Marischal College, which was temporarily vacated for the time being. The accommodation thus afforded was excellent.

On the general sectional proceedings we shall make no comment, except on the mode of preparing the business of the meeting, which, as at present practised, we think objectionable.

The present method of arranging the proceedings day by day during the meeting necessitates haste and a want of method in the conduct of the business, which result in important papers being only half read and a precipitancy in the closing of discussions which is detrimental to advancement in Science, and not courteous to the gentlemen whose papers have cost much thought, labour, and anxiety. How often, as "iron sharpeneth iron," does the contact of thought and the abrasion of mind evolve important truths, give more point and consistency to the paper read, and *advance* in a true sense the knowledge of the world! As twelve months elapse between this meeting and its successor, there is time for those gentlemen having experiments in progress, and others to whose mind subjects of interest present themselves ere the next meeting at Oxford, to prepare carefully—and not hurriedly as is too much the system at present—to bring certain definite questions before the Association in its various departments. The system of receiving papers up to almost the last hour of the Association's meeting encourages procrastination, which is not only the thief of the author's time but of the members who take an interest in the subjects brought before the sections. We would suggest, therefore, in order to economise the short time to which the annual meetings of the British Association is confined, that a precise period *before* each yearly meeting be fixed for receiving papers (not the *names* of papers), and that none be received after such date. That all papers should be *complete*, both in the text and the diagrams, to prevent the evil (of which we have too much reason to complain in connexion with the late meeting) of gentlemen of even high scientific position apologising for unfinished papers and not fully digested thought upon their subjects. Our plan would enable the proper officials to have printed and ready for circulation among the members and associates, on the first day of meeting, the *Journal of Sectional Proceedings*, containing the business of the *whole week* methodically and carefully arranged for each day, thus giving some time for the preparation and discussion of every subject brought forward.

We confess we have an opinion that a properly conducted discussion frequently brings out more important facts relative to a given subject than is contained in the paper which provokes it. Some better system for the conduct of the discussions than at present exists should be adopted, in order to prevent the time of the sections being frittered away, as happened in many cases at the Aberdeen meeting. We would only allude to one instance which occurred on the last day of the sectional meetings. In section A no fewer than *thirty* papers were put down to be read on that day. The opinion of a certain learned professor was challenged on an important point, and the gentleman (to whose opinion all reflective minds pay deference) proposed to occupy the section only a few minutes; but, notwithstanding his own promise and the known amount of business for the day, the worthy professor spoke for more than an hour on his pet subject. Similar instances of useless loquacity (in which speakers repeated themselves frequently) might be adduced. Enough has been said, however, to illustrate our opinion that a fixed period should be given to each speaker, who ought to come to the section prepared (owing to the method we have proposed of giving due notice of the subjects to be brought forward each day) to condense his address so as to keep within the specified time for all who take part in the discussions.

It would perhaps be advantageous that the authorities of the British Association should discourage the scientific discursiveness of its members. Pope says, "one science only can one genius fit." There may be mathematical minds of sufficient magnitude to prepare subjects in more than one department of general knowledge, but the instances are few. One carefully-prepared and well-digested paper on *the* subject of science or art to which the life and solicitude of the writer has been specially devoted, would be more likely to add to our stock of knowledge, and *advance* the cause of science, than numerous crudely-prepared papers on various subjects, as in the late meeting were eliminated from the mental *manufactories* of some learned gentlemen, foreign and English.

Lastly we would suggest that the Council of the British Association should discourage at its meetings the growing evil of allowing any gentleman — be he English or foreign — bringing indiscriminately and prominently forward *patented* articles of little value, with the sole view of *advertising*, with the apparent sanction of the Association, perhaps worthless inventions. If such patented inventions are really valuable there are legitimate modes of advertising them other than in the section rooms of a learned society. Certainly great caution at least ought to be exercised in their admission at the Association meetings.

To turn to other and more pleasant subjects connected with the Aberdeen Meeting, we may say that the opening address of the Royal President took the audience by surprise; and if he omitted to review, as is usually the case in such addresses, the advance of Science during the past year—bringing prominently before the members the more salient points of progress in the various departments of human knowledge during that period—yet there was so much force and truth in the address, that the vast assembly was astonished and delighted at the wide range of his Royal Highness's knowledge, and that he could in our language place the conceptions of his mind so faultlessly before his audience. The Royal Consort of our beloved and gracious Sovereign has raised himself by his able address on this occasion in the estimation of the thoughtful portion of her Majesty's subjects.

Supplementary to the intellectual treat provided by the Association in the Sections and in the Music Hall, local bodies had opened at the same time, for the delectation and amusement of the visitors to the city and of the general public, photographic, archæological, and horticultural exhibitions, an exhibition of historical portraits and objects of antiquity, and collections illustrating the geology, &c., of the North of Scotland—to all of which the members of the British Association were admitted on showing their tickets. The admirable manner in which these various collections and exhibitions were organised by the gentlemen to whom the arrangements were intrusted, exhibited great taste, judgment, and intelligence, which reflected much honour on their native city. In the excellent Photographic Exhibition we took of course especial interest, and elsewhere will be found an estimate of the principal pictures.

At both the *conversazioni* many objects of high interest were arranged around the great hall, and the music of the organ (though the instrument was unfinished) lent its influence to enhance the pleasure of the crowded assemblies. The appearance of the hall filled by company was brilliant in the extreme. If the assemblage present on each of those occasions — mainly drawn from the northern counties as no doubt it would be (Aberdeenshire of course being best represented) — can be taken as a type of the womanly beauty and manly proportion and strength of the North of Scotland, it would compare most favourably with that of any other city or town in her Majesty's dominions. The idea of holding these *soirées* is a happy one, for at them grave men of science can unbend and fraternise with the less cultivated portion of the public. On the evenings of these assemblies the interior of the hall was a study for an artist. The varied colours of the ladies' costumes — the stream of black-coated and white-neckclothed gentlemen almost vainly endeavouring to effect locomotion among the wilderness of crinoline — here and there a Highland costume or foreign dress giving variety to our English attire—the delightful babel of tongues, foreign and domestic (among which could be detected the peculiar accents of Belfast, Kilkenny, Cork, and Dublin, the more musical though not less varied sounds from southern counties, the broken English of some French, German, or Russian *savant*, mixed up faintly with the predominating utterances of our Scottish friends)—all conduced to render the scene at once animated and pleasant to both eye and ear.

We must not omit to add that Messrs. Smith, Beck, and Beck, of London, exhibited at the *soirées* some of their educational, one of their students', and one of their most complete achromatic microscopes, combining the highest magnifying power with the greatest delicacy of mechanical arrangement. The light used with them was their improved belmontine lamp. Whilst these instruments received a very large share of attention, those which attracted the greatest notice were their achromatic stereoscopes, in which were exhibited Mr. Warren de la Rue's photographic views of the Sun, Moon, and Saturn. In the first advantage having been taken (for the production of the stereoscopic effect) of the rotation on the sun's axis, and the consequent change in the position of the spots. Whilst in the last the same effect was produced by combining photographs from two lithographic views, drawn from micrometrical measurement, taken at an interval of three years, the result being obtained from the difference in the plane of the orbit as

viewed from the earth. The stereoscopic effect produced by all of them was most satisfactory, and showed the advantage of this mode of examining the form of the celestial bodies.

The admirable arrangements made by the local officers of the Association, aided by the hearty co-operation of the Lord Provost, tended greatly to the success of the meeting at Aberdeen. To Mr. White, one of the local secretaries, we are indebted for much assistance, and we take this opportunity of acknowledging his kind aid.

We shall now proceed to give those papers connected with the art of photography which we were enabled to procure or report, with some portions of the discussions which followed the reading of them.

The following is extracted from the Report of the Kew Committee:—

"Since the last Meeting of the Association, the unfortunate death of Mr. Welsh has retarded the experiments with the Photoheliograph, but from time to time they have been gone on with, at first by Mr. Chambers, who obtained some very fair results, and latterly by Mr. Beckley, as his other duties have permitted; and in order that they might be prosecuted more continuously, the Committee have fitted up a photographic room in close contiguity to the instrument. This addition to the photographic establishment has been attended with the most promising results; and the Committee have satisfaction in reporting that the difficulties which have hitherto presented themselves in the way of a daily photographic record of the sun appear to be almost entirely surmounted. Since the erection of the photographic room, Mr. Beckley has been enabled to make a series of experiments, and has turned his attention to the exact determination of the chemical focus of the Photoheliograph, which there was reason to suspect did not correspond precisely with the visual focus; for although the chromatic aberrations of the object-glass had been specially corrected in order to obtain that result, the secondary-glass, which magnified the image, was not so corrected. It has been found, after repeated trials, that the best photographic definition is obtained when the sensitised plate is situated from 1-10th to 1-8th of an inch beyond the visual focus in the case of a 4-inch picture; and that when this adjustment is made, beautiful pictures are obtained of the sun, four inches in diameter, which still bear magnifying with a lens of low power, and show considerable detail on the sun's surfaces besides the spots, which are well defined. Mr. De la Rue, by combining two pictures obtained by the Photoheliograph at an interval of three days, has produced a stereoscopic image of our luminary, which presents to the mind the idea of sphericity. Under Mr. De la Rue's direction, Mr. Beckley is making special experiments, having for their object the determination of the kind of sensitive surface best suited for obtaining perfect pictures; for it has been found that the plates are more liable to stains of various kinds, known to photographers, under the circumstance of exposure to intense sun-light, than they would be if employed in taking ordinary pictures in the camera. Now that the photographic apparatus has been brought to a workable state, Mr. De la Rue and Mr. Carrington, joint Secretaries of the Astronomical Society, propose to devote their attention to the best means of registering and reducing the results obtained by the instrument, provided the funds which may be necessary are placed at their disposal. The difficulties which have stood in the way of bringing the Photoheliograph into an efficient state of work were such as it required no ordinary degree of perseverance to surmount; and the Committee have therefore the greater satisfaction in reporting that these have been overcome, in so far as to render the Photoheliograph a valuable recording instrument:—the minor improvements still contemplated have for their object the production of pictures as free as possible from the spots and blemishes to which all photographs are liable, and sun-pictures in particular."

Friday, September 16th.

SECTION A.

Mr. A. Claudet, F.R.S., read short papers *On the Stereoscopic Angle; On the Focus of Object Glasses; On the Stereomonoscope;* and *On a Changing Diaphragm for Double Achromatic Combinations.*

Our reporter was unfortunately engaged in another section when these papers were read. Mr. Claudet not having quite completed his MS. in time for the meeting, was unable to furnish us with abstracts, but has promised them in time for our next publication.

Saturday, September 17th.

SECTION A.

ON A NEW PHOTOGRAPHIC LENS.

By Thomas Sutton.

Up to the present time no lens which has been used by photographers for the purpose of copying architectural subjects has been capable of rendering correctly the image of a straight line in the margin of the picture. When the common form of the photographic view lens is used, which consists of an achromatic meniscus, placed with its concave side towards the object, and with a stop at some distance in front, the marginal lines of the picture which should be straight are rendered concave towards the centre of the picture; and when the Petzval view lens is used, which consists of an achromatic meniscus, placed with its convex side to the view, and a much smaller achromatic concave lens placed at a certain distance behind it, and having a stop in contact with it, the marginal lines of the picture which should be straight are rendered convex towards the centre of the picture. In fact no photograph of an architectural subject taken with the lenses in common use will bear the test of a straight edge applied to the marginal lines, which are always curved either inwards or outwards.

In the present paper I will describe a combination which I have invented, by which the above effects of distortion are totally obviated, and which gives an image that is mathematically perfect. I may add that this lens was recently tested by a Committee of the Photographic Society of Scotland against the best forms of the common lenses, made by the most celebrated makers, Voigtlander, Ross, Goddard, &c., and it was pronounced to be the only lens which gave an undistorted image — at the same time that it satisfied all the conditions of a good lens.

The conditions for obtaining an image free from distortion are these:—

1st. The axis of every pencil must emerge from the combination in a direction parallel to that of incidence.

2nd. The axis of every pencil must pass through a certain fixed point.

3rd. The image of every luminous point of the object must be formed at the point where the axis of the pencil meets the focussing screen.

These conditions are rigorously fulfilled by the lens which I have invented and will now describe.

The combination is a symmetrical triplet, consisting of two equal achromatic plano-convex lenses, one at each end of a tube, placed with its convex side outwards — and a small double concave lens of equal radii placed exactly midway between them. In contact with the double concave lens a small stop is placed.

It is evident that in this combination a small oblique pencil is incident excentrically upon the front convex lens — that its axis after suffering deviation passes centrically through the concave lens without suffering further deviation — and that it is then incident excentrically upon the posterior convex lens, from which it emerges in a direction parallel to that of incidence.

The above is true of every oblique pencil, and their axes all pass through a common point, which is the centre of the symmetrical combination — and which point I will call C.

The 1st and 2nd conditions are therefore fulfilled.

The proof that the 3rd condition is also fulfilled is as follows:—

The focus of an oblique pencil is in every optical instrument a disc of light, and not an exact point. The size of this disc is reduced by using a small stop. When it is sufficiently reduced by using a sufficiently small stop the focus upon the screen is said to be good. In that state the ray which passes through C (and which I have called the axis of the pencil) is one of the rays which compose the small disc or good focus, because C is at the centre of the stop. The focus is therefore at the point where the axis of the pencil meets the focussing screen; and therefore the 3rd condition is fulfilled.

It is necessary in every kind of photographic view-lens to use a small stop, because the objects of a view are at different distances from the lens, and a good focus cannot be obtained in any other way. The use of a small stop is not therefore confined to my triplet; and when the image is rendered sharp and distinct by the use of a small stop, it is also totally free from distortion.

By a fortunate circumstance the triplet gives an image which is equally illuminated in every part, because the area or base of the oblique excentrical pencil upon the front lens is greater than that of the direct central pencil, and in this way the loss of light from obliquity is counteracted

Spherical aberration in the direct central pencil is totally corrected, because the negative aberration of the concave lens counteracts the positive aberration of the convex lenses. There is consequently brilliant definition in the centre. At the same time the marginal definition is as good and the field as flat as that of any lens now in use.

In order to get good marginal definition and the proper flatness of field, the distance between the convex lenses should be about one-sixth of their focal length, and the focus of the concave lens should bear to that of the convex lenses the ratio of about 13 : 8.

SECTION B.

ABSTRACT OF REPORT ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.

By Professor MASKELYNE, J. D. LLEWELLYN, F.R.S., T. F. HARDWICH, and E. HADOW.

IN this report the authors confine themselves to the results obtained with salts of silver; and the question first considered is the chemical condition in which the silver remains when light has completed the decomposition of the chloride as far as it can go. Is the result a sub-chloride of silver, or one where escaping, the chlorine and silver are completely dissevered, the gaseous element and the metal remaining mixed with, or rather incrusting particles of unaltered chloride?

The paper then proceeds to detail certain experiments with reference to the determination of the question, bearing in mind that in the photographic processes which require chloride of silver that substance is not used by itself, but always in conjunction with nitrate of silver and also with organic substances, among which the paper and the size upon it are prominent. The authors considered that they were justified in drawing the following conclusions:—

1. That the action of light on chloride of silver, is to reduce it in so far as it is able to penetrate its substance to the state of a sub-chloride.

2. That in the presence of nitrate of silver this deposit of sub-chloride is necessarily more plentiful, but that in both cases, moisture being present, some part of the liberated chlorine passes into an oxide, which in the latter case prevents a portion of the chlorine set free from conducing to the formation of fresh sub-chloride.

From this point they proceed to the discussion of the photographic image in more complex, but for the photographist more available, forms. And in doing so, they point out that the image varies in its character in different stages of the photographic process. The first result obtained by the light, even if it be the same in all stages of the insolation, is not the result which is in many cases left after the fixing solution has performed its work, while this is again frequently succeeded by another variety of image by the employment of the methods called toning.

The results at which they conceived that photographic chemistry may be said to have now arrived, in respect to the direct processes involving the use of silver salts, may be thus stated:—

The materials employed perform various functions—

1st. One of these is that of supporting the picture as a mechanical material or basis for holding the chemical bodies. Of the substances so employed, the tissue of the paper is one. Pyroxyline is spread on glass to afford another; the latter appears to be inert, the former, on the other hand, seems to aid in producing the chemical results.

2nd. The silver salts employed, whereof the chloride (for which other salts may be substituted, each with a specific effect), appears to act by imparting *sensitiveness;* the nitrate, on the other hand, is present in excess to keep up a constant succession of sensitive material, and so to give *vigour* and *intensity* to the image.

3rd. Gelatine as a size, or albumen as a glaze, and various other substitutes for these, but little linked together by any chemical analogy amongst them, co-operate by conferring *rich tints* and deep tones, while they impart to the image formed on them an immunity from the destroying action of the fixing process, and form a mechanical service more or less impenetrable, which prevents the other sensitive compounds from sinking into the paper.

With reference to photographs produced by development, the several causes which determine the deposit of the images in their several states appear to be these:—

1st. *Materials forming the sensitive film.*—Pyroxyline in chemical purity has no tendency to form the darker image. Albumen and the heterogenous substances (including decomposed collodions), which we have had to yoke in the same class with it have this tendency. In general the tendency to produce the darker image is found to be in something like an inverse ratio, *cæteris paribus*, with the sensitiveness. The use of bromide of silver with iodide imparts to a collodion film a tendency to deposit the metallic image, at the same time that the sensitiveness is much impaired, and a very powerful reducing agent is needed to develop it. With albumen the influence is not felt, for with albumen, bromide of silver is held to increase the opacity of the image

2nd. *The nature of the developing agent.*—The substances used to develop the latent image, besides the free nitrate of silver invariably necessary, embraces also without exception one ingredient the character and the purpose of which is to reduce the salts of silver.

3rd. *The character of the light* has also a remarkable influence in inducing a grey or a dark character on the developed image. If the picture has been produced by an intense light, as by a lens of large aperture, or as in the case of an exterior as contrasted with an interior view of a building, or as on a dull misty day in contrast with a bright and sunny one, it will be found that, *cæteris paribus*, the tendency of the shorter action of the light is to allow the reduction of the silver in the metallic form. On the other hand, more intense light has given to the molecules of the sensitive film a controlling energy, which they exercise on the deposit, and which appears analogous to that of the light in the direct process in its modifying the reduction, and giving it the form of a production of an argentous compound. As though the iodine compound became in a certain sense phosphorescent to the chemical rays of the light, and operated upon the mixed silver salt and the reducing agent, as they float over it, in the manner that the direct light might be supposed to do.

The PRESIDENT (Dr. Lyon Playfair) said—A report upon the subject of the chemical character of the photographic image has long been desired; and although we are unable, on account of the length of the report, to do full justice to it on this occasion, no doubt, when we have an opportunity of reading it at leisure, we shall find that many useful deductions have been made, and apparently with great caution. Unfortunately our ignorance of what the true chemical character of the photographic image is, is at present very great. As it was, one or two little points which have occurred to many chemists made it desirable to go into them more particularly; and there is one experiment which I may mention, as I happen to know it, and as it is a very striking one, that would give some indication of the nature of the photographic image. If you take any calotype, and dip it into a solution of bichloride of mercury, it becomes perfectly white, and no vestige of the image remains; but afterwards, if it be placed in hydrosulphate of soda, it becomes completely restored. The mode in which the chloride of mercury acts in rendering the image latent, has as yet, as far as I am aware, received no satisfactory development.

ON A PHOTOGRAPH OF FLUORESCENT SUBSTANCES.

By Dr. GLADSTONE.

IT is well known that the rays of light which are effective in producing photographic images are not the most luminous—that they are those which have the most refrangibility, as the violet, or what have been called the lavender rays, and others invisible to the eye, but which are extremely active upon the chemical substances.

It is known also, especially through the researches of Professor Stokes, that many bodies have the power of altering the refrangibility of light—that disulphate of quinine, for instance, is a body which in solution transmits all the visible rays of light; but that there are certain of those invisible rays which are effective in producing photographic images, which by the disulphate of quinine are altered in their refrangibility, and become blue, so that we actually see a peculiar blue upon the surface of the liquid when they come in contact with it. It has occurred to me very frequently, that if we had a photograph thus prepared, we should very probably find that the chemical rays, being altered in their refrangibility, were removed from the field of action, and that they gave no image. Dr. Wilson brought similar ideas before the Photographic Society of Scotland, and they were published; but it appeared to me that no one was actually performing the experiment; so a short time ago I prepared these two pieces of paper. [Dr. Gladstone referred to the two pieces of paper he had used in his experiment, and which he exhibited]. On the first sheet I have written something in a thick solution of mixed ditartrate and disulphate of quinine. On the other paper I have made a little drawing with ink of a branch, and drawn the leaves in chlorophyll. The way in which it was prepared was this:—take tea-leaves which have been exhausted with water till all the colouring matter is removed, steep them in alcohol, and you have a solution of very little colour, but highly fluorescent; and this is the substance which I have employed in drawing the leaves with. I had a photograph taken of these papers: I did not know whether the conditions were right to produce the effect, but I find that there is no mistake whatever as to the effect. When I looked at the image of

these papers in the photographic camera, so as to obtain the focus, I could not see the slightest trace of anything on this paper. I noticed this especially in the second experiment. The image came out perfectly distinct when it was developed. [The photographs were handed round the room]. I have no doubt that more striking results still may be obtained, by using different substances, and using them in different proportions. I can easily imagine, for instance, that we might, instead of producing a varied image from a paper on which nothing is visible, obtain a result the actual reverse of that which is presented to the eye. Thus, there are many papers of a blue or purple colour which give a very great photographic effect; and I can easily imagine that by taking such a paper as that, and writing upon it with disulphate of quinine, putting it on thick, so as to cause the writing to be white, and the paper to be of a deep colour, when the image was developed the paper would come out white, and the writing upon it dark in colour. I have merely brought forward this experiment to show that what theory rendered probable is really the fact.

M. Abbé Moigno then exhibited *Two Photo-Chemical Experiments, by M. Nièpce de St. Victor.* He accompanied the exhibition with an address in French.

The President subsequently detailed the substance of the Abbé Moigno's remarks in English, which we append.

The President said—For those who did not understand the Abbé's remarks, I may repeat what he has said. A solution is made of oxalic acid and salt of uranium. Oxalic acid is placed in the solution, and in the dark nothing happens, but when it is exposed to light, the light coming upon the oxalic acid decomposes the latter, producing carbonic oxide and carbonic acid. By the tube which is used we are able to measure the intensity of light, so that it is a kind of photometer. The other experiment is similar to the first. In this solution there is placed a galvanic coil (connected so as to form a complete circuit). In the dark there is very little deflection of the attached galvanometer, but when exposed to the light there is a great deflection, and by the amount of this deflection it is possible to measure the intensity of the light. The photometer seems to me to be exceedingly ingenious, and likely to produce very useful results.

Dr. Gladstone: I have been very much interested in the matters which have been brought forward. You are all aware that Professor Bunsen and Dr. Roscoe have brought forward and used a photometer of great delicacy and beauty. Unfortunately, however, it is so complicated, that I fear very few except those manipulators themselves will be able to make use of that instrument. We want a good and practical photometer, and this may be the one that is required. I remember that at the last meeting of the British Association, at Leeds, a young man, Mr. Fowler, brought forward a paper which struck me as being a very excellent one for this subject. He had employed a mixture containing oxalate of mercury, if I remember rightly, and had obtained results of very great interest, showing the influence of time upon the action of the sun on these substances. I hope he has been going on with his experiments and that we soon shall hear more of his results.

Abbé Moigno then made an interesting communication in French in regard to *a Collection of Photographs in Charcoal and Metallic Powder, and Photographic Enamels,* which he exhibited. We again avail ourselves of Dr. Lyon Playfair's explanation.

[A number of beautiful photographs in charcoal, principally executed by M. Lafon de Camarnac, the inventor, as well as several fine enamels on the new principle explained by M. l'Abbé, were handed round and examined by the Section. Some of the photographs were coloured with dragon's blood].

The President said—The first process which has been brought before us by M. l'Abbé Moigno is a very important one, and has been apparently brought to great perfection in France. It is the method of having charcoal photographs instead of the ordinary silver ones. The process consists in using—first a mixture of gelatine and bichromate of potash; the parts of the gelatine on which the light falls become insoluble in water, and more or less soluble according as the light falls with more or less intensity. The photographs are then exposed to the action of the vapour of water, and the portions which have not been acted upon by light become capable of removal, and then charcoal powder is dusted over the photograph thus prepared, and you see it produces calotypes of great beauty, and of a substance which is quite indestructible, either as regards the chemical action of oxygen or that of light. The other photographs, such as those of different colours, are produced in the same way; only instead of charcoal powder, coloured materials are used. The second part of the Abbé's communication was still more curious; and that was the production of enamel by a similar photographic process. In the same way the material used was a mixture of gelatine and bichromate of potash, and then the pulverised oxide in a fine state of powder is sifted over it. Then it is melted in the ordinary enamel furnace, and it becomes a true enamel. The last part of his communication was to the effect, that various chemical agents, which produce different colours, such as Prussian blue, cobalt, iron, and so on, may be employed to obtain colours of different degrees of brightness; in fact such as we have seen presented lately by Mr. Mercer to the Chemical Society.

The President having invited discussion on the various photographic papers of Dr. Gladstone and the Abbé Moigno,

Dr. George Wilson, Professor of Technology, Edinburgh, said:—I ask the attention of the Section to the very distinct communication which was first laid before us, on the possibility of producing a positive effect from a seemingly invisible line drawn in sulphate of quinine. Dr. Gladstone referred to a communication which I made to the Photographic Society of Edinburgh some years ago, but I may say the credit of that belongs to him, for I went no farther than perhaps most would have done. When light falls on a fluorescent surface, and then is reflected from it, Mr. Stokes explained then the effect of the fluorescent body is to convert a ray of a certain refrangibility into one of a lower refrangibility. If we acknowledge the fundamental principle of the co-relation of forces, then we cannot expect to change an invisible chemical ray into a ray of light, and retain the same chemical power. It now appears from Dr. Gladstone's observations that a fluorescent surface, such as one of quinine, appearing to the eye equally white with a surface of paper, reflects a ray of considerably less chemical power; and certainly the fact is one of very great interest, and I presume may be generalised to all fluorescent substances.

Now, there are several points of interest connected with this beautiful observation. It would be very curious to know if it be possible to convert a ray originally taken from beyond the violet, and having a very high actinic power, into a ray deprived of chemical action altogether, as so far as Dr. Gladstone's observations have gone we have not reached the decision of that question one way or another. In regard to a perfect photograph, plainly two surfaces of paper, to the eye seemingly equally white and equally suitable for being made the recipients of a positive photograph, may in reality differ very much in their fitness for that purpose, as the one is more highly fluorescent than the other. Let me point out in what way this is an object of interest. We have copies now taken largely of coloured pictures of oil paintings or water colours, by the camera obscura, as photographs. We are in the habit of speaking of certain effects as admitting of being obtained from certain colours; and we lay down a rule in regard to that. But suppose, for example, we had an oil painting where much red occurred, and that the red used by the oil painter was vermilion; that a copy is made in water colour, and that the red used there is carmine, and to make the case very striking, that a third copy is made where the colour used is the red bichromate of lead, or the iodide of mercury. You may have these copies with the red equally pleasing to the eye. We should, according to the canons at present laid down as to the copying of colours in the camera obscura, expect to find all the reds of the three pictures come out, *cæteris paribus*, equally good or equally bad; but when we observe this result of Dr. Gladstone's, and remember that carmine is a decidedly fluorescent body, whilst vermilion and the iodine of mercury are not, it is plain we should have a difference in the results of the photograph, altogether apart from the effect of colour. The colours may be indistinguishable by the eye: the eye cannot detect invisible fluorescence, but the moment the photograph of the copy is taken it will betray itself. I cannot help suggesting, especially as we have standing committees reporting to us on the chemistry of photography, that their attention should be particularly directed to this matter. Sooner or later this would lead us to a law regarding it. Let me point out a very curious example which was brought before my notice by a well known active member of the Edinburgh Photographic Society, a clergyman, who has taken many photographs in the Pyrenees. He had occasion to copy a photograph of a sloop. He obtained the device of it on a sheet of paper prepared in the ordinary manner for a positive impression. This he put into a frame of glass and exposed it to light, but owing to the thinness of the paper not quite filling up the case, a plain sheet of paper, merely for the sake of thickness, was put in to make up, and the

whole exposed in the ordinary way to the action of light. By and bye this was removed, the copy being made. He again had occasion to make a similar copy this time of a ship. He arranged matters as before, and as it chanced took the former plain sheet of paper and placed it as before, and copied the second subject in the same way. He had occasion afterwards, I do not know for what reason, to charge this same plain sheet of paper with a silver salt and expose it to light, and was astonished to see come out the image both of a sloop and of a ship. He has given me one of the impressions, where in fact, lying at the back, in a very strange way, the most prominent parts of the picture have made an impression which remained there for days, and became permanent when a silver salt was employed. I hope my suggestions in regard to coloured photographs will not be lost sight of by the photographic committee.

Mr. Taylor: There is one fact in regard to the ordinary silver photographs which I have never seen mentioned, and that is, that unless great care is taken it is exceedingly likely that chlorine may find its way into the operation and produce bad results.

The President remarked that now very generally means are taken of removing any traces of chlorine.

Monday, September 19th.

Section A.

CELESTIAL PHOTOGRAPHY.

By Warren de la Rue, F.R.S.

Professor Bond, of Cambridge, in the United States, was, so far as I know, the first to make a photographic picture of a celestial body. By placing a daguerreotype in the focus of the great refractor of the observatory of Cambridge, of fifteen inches aperture, he obtained a daguerreotype of our satellite. This was, I believe, about the year 1850; as I remember seeing one of these pictures in the Exhibition of 1851, and was so charmed with it that I determined to try and do the like at the first opportunity.

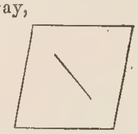
At the latter end of 1852 or the beginning of 1853 (the exact period I cannot now fix), I made some successful positive lunar photographs on a collodion film, by means of an equatorially-mounted reflecting telescope of thirteen inches aperture, and ten feet focal length, cast and polished by myself; and I believe I was the first to use the then newly-discovered collodion in celestial photography. In taking these early photographs I was assisted by my friend Mr. Thornthwaite, who was familiar with the employment of that new medium. At that period I had not applied any mechanical driving motion to the telescope, so that I was constrained to contrive some other means of following the moon's apparent motion. This I accomplished by hand, by means of a sliding frame. The motion of the slide being adjusted to suit the apparent motion of our satellite, the pictorial image of the moon could be seen through the collodion film, and could be rendered immovable as regards the collodion plate, by causing one of the craters to remain always in contact with a broad wire, placed in the focus of a compound microscope, affixed at the back of the little camera-box which held the plate. Although the photographs were taken under the disadvantage referred to, namely, the want of a driving motion, nevertheless the excellent results obtained showed how perfectly the hand may be made to obey the eye.

I could not, however, proceed in taking photographs of the moon in this way alone, but required always the aid of an experienced coadjutor, willing to lose the greater part of his night's rest, and often to be disappointed — failures resulting from the passage of clouds, and numberless impediments sufficient to damp the ardour of the most enthusiastic. For some months Mr. Thornthwaite was so good as to continue his invaluable aid, and several good pictures were obtained by us; but the difficulties we had to contend with were so great, that, after taking a certain number of pictures, it was at last resolved to discontinue my experiments until such time as I had applied a driving motion to my telescope. This was done early in 1857, since which period I have unremittingly followed up the subject whenever my occupation and the state of the atmosphere has permitted me to do so. With what results, the Association will have an opportunity of judging by the examples now on the table. [Mr. de la Rue exhibited several very fine lunar photographs, largely magnified, which were examined and much admired by not a few of those present].

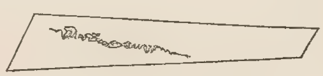
Some time after I had discontinued my experiments in 1853, Mr. Hartnup, of Liverpool, by himself, and aided by Mr. Crookes and other photographers, took some good pictures of the moon, as did also our excellent officer, Professor Phillips. Father Secchi at Rome, Mr. Fry, at Brighton, Mr. Hoggins, near London, have also produced lunar pictures. It is almost needless to say that Professor Bond, of America, continued to follow up his researches in celestial photography with the great refractor; but I may mention how, that before his death he applied his process with promise of a fruitful future, in measuring the distances and angle of position of double stars, and in the determination of their magnitudes; and that of late years this new application appeared to have engaged his attention more than lunar photography.

The mention of photography — one of the last applications of our art — reminds me that the image of such a heavenly body being of the most simple form, it would render what I shall hereafter have to say more easily understood if I were at once to introduce to your notice what happens in applying photography to sidereal astronomy. The optical image of a fixed star, be it remembered, is an optical point, which in consequence of the properties of light is seen in the telescope as a very minute disc surrounded by certain rings, which become fainter and fainter as they enlarge, these rings being always more or less broken up according to the state of the atmosphere; the photographic image, on the other hand, is a mere speck, difficult to find among other specks present in the most perfect collodion film, when viewed with a high magnifying power.

Let us now suppose we have a telescope to be turned upon α Lyræ, which is conveniently situated, from its great altitude on the meridian, for photography, and is moreover sufficiently brilliant to give an instantaneous picture. If the telescope be steadily supported at rest, the star will, in consequence of the earth's rotation, come along the field of the telescope in a line parallel to the earth's equator; and as it produces an instantaneous picture, the image obtained is a line indicating the path of the star, thus, for example. [Mr. De La Rue indicated the form of the image on the black board in this way,



and continued.] We should be led to expect, *à priori*, that the line for the short distance it is made would appear straight; but so far from this being the case, the line is much broken up and disturbed, and consists of an immense number of points, crowded in some places and scattered in others, thus —



This arises from disturbances in our own atmosphere, which cause the optical image to flit before the eye, which nevertheless can make out the proper figure of the image, although it dances before it several times in a second, and the mind is able to select and remember only the states of most perfect definition. The photographic plate, however, remembers and records all the disturbances, and hence presents as a result a number of positions of the point of light, and consequently a less beautiful picture than we see optically.

In the foregoing remarks it was supposed that the telescope was at rest; but now let us suppose that the telescope is mounted on an axis parallel with the earth's axis, and provided with a driving apparatus, capable of carrying the telescope round in the direction of the star's apparent path, so equally, that if viewed by a micrometer eyepiece, the star would remain in contact with one of the wires of the eyepiece. The photographic image of a star obtained by a telescope, under these conditions, after some seconds' exposure, is not one clear disc or point, but a conglomeration of points, extending over a greater or less surface, according as the atmosphere produces a greater or less flickering.

A photographic image of a star, after an exposure of some seconds, is consequently a disc of comparatively large dimensions in comparison with the true image which can be really seen on the plate. It will readily be seen, that as a single point like a fixed star acquires comparatively large dimensions on a sensitised plate exposed for some seconds to its action, so must every optical point in an image of other celestial objects from the same cause occupy a space of greater or less dimensions; hence the photographic image will never be so perfect as the optical image given by the same telescope until we can produce pictures of all objects instantaneously, and we are a long way from this desirable end at present.

Notwithstanding, however, the disadvantages under which the photographer labours, I have obtained pictures of celestial objects, showing details which occupy a space less than two seconds in each dimension—I might, I think, say even one second. Now one second $= \frac{1}{800}$ of an inch on the collodion plate, and a second on the lunar surface at the moon's mean distance, being about one mile. The lunar picture in the focus of my telescope is about $1\frac{1}{10}$ inch diameter, but this varies of course with the distance of our satellite from the earth. It will be conceded much valuable work has already been done, and that if the photographs are taken for a number of years, silenological disturbances will not escape detection if they take place.

With regard to the size of focus stated, it might be suggested that it would be better to enlarge the size; but this would prolong the time, and allow greater disturbance to take place. Thus the result would not be so good. It is by magnifying them afterwards we get good copies. One of these on the table is about eight inches diameter; that is to say, it is magnified about seven and a-half times.

Occasionally I take photographs of the fixed stars, and have made pictures of the double star, Castor, and others, but, as a general rule, I devote my attention chiefly to the moon.

As in the production of the lunar pictures some few seconds of exposure are required, it is essential to have a clock-work driver to the telescope, capable of adjustment to lunar time, which differs from sidereal time. In my own telescope this is at present effected by altering the length of the conical pendulum or friction governor, thus altering the time of its notation (or double beat). And this plan, or some modification of it, is universal. My experience, however, has pointed out several inconveniences in thus changing the speed of the governor or pendulum, and it is my intention to make such alterations in the construction of the clock as will enable me to alter the going of the telescope without changing the rate of the pendulum. This I propose to do by substituting what is known as the disc and plate in mechanics for the wheel work now immediately connecting the machinery of the clock with the pendulum,—the disc and plate being capable of producing a variable motion according as the disc is nearer to or farther from the centre of the plate. The pendulum will, by the proposed plan, be driven by frictional contact, and having employed this system in other machinery, I feel persuaded that its application to the clock-driver will not be attended with difficulty.

Until very lately my lunar pictures were obtained by placing the sensitised plate at the side of the tube, opposite the diagonal reflector of my Newtonian telescope, and hence the light before it reached the plate had been twice reflected. I would remark that it requires a very firm support for the diagonal mirror of even a 13-inch mirror; hence the arm carrying this mirror was firmly screwed to the side of the telescope tube, and being immovable I could not make experiments in taking the pictures direct; that is to say with the light only once reflected. I have however within the last few months contrived a proper apparatus, and I now take celestial pictures at will, either direct or reflected, at the side of the tube, and it does not require more than a minute to change the apparatus to produce either result. So that I can make experiments to determine the relative actinic intensity of the light after one or two reflections. The experiments are still in progress, and have been began so recently that it is scarcely advisable to hazard a conjecture as to the result; but I may say that I am disappointed as to the increased rapidity of the production of a lunar picture by the direct method over the twice reflection method. And I am inclined to infer that Steenheil's result, as to the loss by reflection of the luminous ray, does not hold as regards the actinic ray.

The reflecting telescope has considerable advantage over the refracting one for celestial photography, on account of all the rays coming to a focus at the same place, which is not the case with the refractor; hence the focus having been adjusted for the luminous image, it is correct for the chemical image, and has not to be disturbed as with the refractor. I attributed much of my success to the employment of a reflector, while my fellow-labourers in the same field have used refractors.

The time occupied in taking lunar pictures varies considerably. It depends on the sensitiveness of the collodion, on the altitude of the moon and her phase. I have recently produced an instantaneous picture of the full moon, and usually get strong pictures of the full moon in from two to five seconds. Of course it is important to have the collodion in a right state, and to be prepared to operate with clean hands and not with dusty apparatus—the moon as a crescent under like circumstances would require about 20 to 30 seconds, in order to obtain a picture of all the parts visible at the dark limb.

Portraits of the moon equally bright optically, are by no means equally bright chemically; hence the light and shade in the photograph do not correspond with the light and shade in the picture; and hence the photograph frequently renders visible details which escape optically. Those portions of the moon, near the dark limb, are copied photographically with great difficulty, and it frequently requires an exposure five or six times as long to bring out those portions illumined, by a very oblique ray, as others apparently not more bright when more favourably illuminated. The high ground in the neighbourhood of the southern portion of the moon is more easily copied than the low ground, usually called seas, and I ventured in another place to suggest that the moon may have an atmosphere of great density, but of small extent; and this idea has, I imagine, received some confirmation from a recent observation of Father Secchi's, of the lunar surface polarising light more in the great low-lands, and in the bottoms of the craters, and not appreciably on the summits of the mountain ridges.

Photography brings out palpably to our senses several facts, which are of course well known, but we do not always think of them — for example, every 29 days we talk of the full moon. Now there is never a full moon visible except before or just after a lunar eclipse. At all other periods of the full moon we are unfavourably situated for seeing the whole of the illuminated hemisphere. The different apparent diameter of the moon at different times, dependent on her distance from the earth, comes out in unmistakable prominence. We are familiar with the moon's diurnal libration, in latitude and longitude, yet we fail to realise the great amount of disturbance unless aided by photography, when we see it palpably before us. Taking advantage of the libration of the moon, we get stereoscopic pictures which present to the eye what the Astronomer-Royal has said was the only experimental proof of the rotundity of our satellite. Mr. Claudet has told us that a dispute has been going on between photographers as to the proper angle for taking photographic pictures, and I infer that one side of the disputants would call my arrangement of the moon pictures to produce photographs unnatural. But, to use Sir John Herschel's words, the view is such as would be seen by a giant with eyes thousands of miles apart.

I have succeeded also in taking views of the planets. Excellent views of Jupiter and Saturn were taken. Amongst the views of Saturn exhibited, there was one taken at the period of the late occultation of Saturn by the moon, and on the photographic plate were delineated the planet and the moon — the former as just emerging from the moon's bright limb. The views of Jupiter were sufficiently large to give stereographic pictures. [With respect to Saturn, the pictures were so small as not to be visible in an ordinary stereoscope; but there was exhibited on the table a stereoscopic view of Saturn, composed of two photographic reductions from the original drawings of Mr. De La Rue, made with great accuracy in 1854 and 1856 respectively — the body of the planet standing out as a spheroid enclosed by a ring.]

Mr. De La Rue proceeded to give a description of the work performed at Kew Observatory (under the British Association), where, at the suggestion of Sir John Herschel, a photoheliograph had been erected, under the direction of Mr. De La Rue, at the request of the Royal Society. Many obstacles, which have been overcome only by repeated experiments, stood in the way of obtaining good pictures of the sun; and these difficulties arose in a great measure from the extreme brilliancy of the sun's image. Mr. De La Rue described the photoheliograph as follows:—[The illustration on the black board we of course cannot give, but Mr. De La Rue's description will be quite intelligible.] The instrument consists of a three-inch object-glass (made by the late Mr. Ross), corrected specially to insure coincidence of the chemical and visual ray. The image is not received directly on the sensitive plate, as is the case in taking lunar and planetary photographs, but is enlarged before it reaches the plate, by means of a secondary lens, which magnifies the sun's image to about four inches in diameter. The time of exposure is so short, that there is a necessity for a special contrivance for regulating the time of exposure. This is effected by means of a sliding plate placed just before the secondary lens. In this plate is a slit which is adjustable in width. The plate before taking the picture is held up by means of a thread. In this position the light is shut off from the sensitive plate. When the picture is about to be taken the retaining thread is set fire to and a spring pulls the plate rapidly across the secondary lens. The time of exposure depends on the rapidity of passage of the sliding plate before the secondary lens.

There have been recently some remarkable spots on the sun; and several views of that luminary were exhibited by Mr. De La Rue,

which showed the progress of these spots across the sun's disc, and the remarkable changes they had undergone during the intervals. The photographs also rendered evident the *faculæ* or bright spots on the sun. By taking advantage of the change of position of the sun's spots in the interval of one day, Mr. De La Rue had produced some stereoscopic views of the sun, by grouping together two photographs taken at that interval.

The PRESIDENT of the Section, Lord ROSSE, added some observations on the method of obtaining lunar photographs; and in relation to experiments made by himself, remarked that the results, so far as he had gone, were not nearly equal to those produced by Mr. De La Rue. He agreed entirely with Mr. De La Rue as to his use of a reflecting telescope; and also felt sure he had hit upon the right method of procedure in many of the very nice contrivances he had described to them.

The Rev. T. CHEVALIER remarked upon the interesting question of how to get rid of the great inconvenience of excess of light in taking photographs of the sun; and alluded to the experiments of M. Porro to overcome this difficulty by the application of polarised light for the purpose of getting the image.

There being a great deal of business for that day before the Section the discussion had to be broken off.

We find in one of the daily newspapers the following:—

"CHINESE INGENUITY.

"In the section of Mathematical and Physical Science, Sir D. Brewster exhibited a very curious specimen of chalcedony, in the interior of which was a landscape minutely depicted. The landscape was produced by the action of nitrate of silver, which had been insinuated into the interior of the chalcedony. It appeared that if this chalcedony was laid up in a dark room for four hours the picture would entirely disappear, and that upon its being exposed to the sun for ten minutes the picture would again revive—consequently that in this specimen there was not only evidence that a landscape might be insinuated into its interior, but also that light might be stored up for a time and again brought out.

"The specimen was shown to the members of the section, who examined it with much interest.

"The Earl of Rosse said that this was one of the many specimens of Chinese ingenuity which they seem to devise for the purpose of puzzling philosophers. Some time ago a Chinese mirror was sent to him by Mr. Emerson Tennent, on the back of which there was a landscape, which, by reflection, was exhibited clearly on the paper. He consulted books on the subject, the explanations given in which were not satisfactory to his mind. He proceeded to test the matter by examination, and found various inequalities on the surface, which had been made with a punch, and the surface again polished over, leaving it apparently smooth and plain.

"The specimen shown to the section belonged to the family of the late Lord Saltoun, and subsequently came into the possession of the lady by whom it was handed to Sir David Brewster. She at first imagined it was simply a piece of chalcedony such as might be employed in mounting a brooch. But on closely examining it, she observed the landscape. It was laid by for four years, by which time the picture had entirely disappeared; but, on being brought to light, in the space of ten minutes the landscape became again apparent."

[The opinion here expressed, that the phenomenon noticed evinces any proof "that light may be stored up for a time and then brought out," appears to be rather a singular *non sequitur*.—ED.]

NOTES ON THE PHOTOGRAPHIC EXHIBITION AT ABERDEEN.

[By a TRAVELLING PHOTOGRAPHER.]

As is my wont, I am about to supply you with some notes picked up at Aberdeen on my ambulatory professional circuit, which I know is a species of pabulum much to your liking. The photographic exhibition was held in a good-sized room, lighted by a large cupola by day and by gas during the evening. The walls were covered to the height of about eighteen feet and a-half with claret-coloured calico, which was stretched on laths. In addition to this wall space there were two screens running up and down the room, on both sides of which pictures were hung. A considerable number of unframed photographs were hung and glazed in the simple way adopted last year at Leeds.

The exhibition took place rather unfortunately at the season of the year when photographers are working in the field rather than exhibiting; still the collection was large, and contained many new pictures by our best photographers, including Rejlander, H. P. Robinson, Wilson, &c. Foremost may be mentioned the beautiful little pictures by Mr. Wilson, of Aberdeen, which for beauty and effect are not to be surpassed. Mr. W.'s instantaneous views would delight a Turner or a Claude. They are really pictures, not simple photographs. There is an atmosphere and breadth about them which is joined to great precision and clearness; and the vigour and tone of purity are admirable. The scenes from the Loch of Park may be considered as masterpieces of the art.

In taking a general survey of the whole collection, comprising 469 separate frames, the most striking impression is received from the bulky pictures, such as the *Cartoons of Raphael* and M'Pherson's *Rome*. Both have been exhibited elsewhere, and criticised in your Journal on former occasions. Although the cartoons, by Caldesi and Montecchi, attract considerable attention from their size and vigour of expression, I fear they are not generally appreciated by the casual visitor. Indeed it is impossible to see them at a single glance; they require to be made the object of a minute and careful study individually, and this cannot be done in the crowd of an exhibition room. I fear they are, like Milton's poetry, more praised than read or studied by the provincial public, especially those of them who have never seen the originals at Hampton Court Palace. Such expressions as—"Oh! ah! Raphael's Cartoons! wonderful things! pass on!" Of course *I* form a much higher estimate of these works than such critics, and do not mean to detract from the merit of these reproductions, about which so much has been already written.

No. 148, M'Pherson's *Rome*, is the next great attraction, both from its size and subject. It is a splendid photographic panorama of the Eternal City. This picture has also been formerly noticed by you.

Bisson Frères exhibit a series of beautiful Alpine views, being Nos. 170 to 175; and while looking at foreign photography, I must not omit to mention those by Ponti, of Venice. They are *Pallazzo Ducale, Venice* (339); *Bronze Gates to Campanile, Venice* (343); *St. Marco, Venice* (342); and *S. S. Giovanni e Paolo, Venice* (338). These are all characterised by extreme delicacy and sharpness.

I must now, after this general survey, return and go over the catalogue a little more particularly to notice what is new. The first that I come to are Nos. 12 to 16, a series of excellent views of that far-famed and beautiful ruin, *Elgin Cathedral*, by John Lamb, of Aberdeen.—Nos. 21 and 22 are interesting rock scenes about Peterhead, and the *Coast of Buchan* (stereographic), by George Dawson, of London. *Rubislaw Quarries* (218), by G. W. Wilson; ditto (104), by John Lamb, form intensely interesting geological studies for those interested in that branch of science.—No. 24 is a frame of stereographs, by A. Adams, of Aberdeen; two of them instantaneous views of the *Market Place, Aberdeen*, with crowds of people laying in their week's stock of provisions, such as eggs, butter, &c., and very well photographed. When I say instantaneous, I don't mean that they are done in the $\frac{1}{1000000}$ part of a second, which space of time a contemporary of yours desiderates as that occupied in taking an instantaneous picture. (?) It is to me nearly as difficult to grasp or get an idea of this infinitesimal space as to reach to eternity. Both are beyond the comprehension of man.—*Lavinia* (26), and *Nearing Home* (27), by H. P. Robinson, Leamington, are not quite so successful as the compositions of Rejlander, but deserving of notice by artists especially, who do not appear to take so much advantage yet of the photograph's assistance as they might, and will do by-and-bye.—No. 45 is a series of very beautiful stereographs by Ernest Edwards, with more half tone and delicacy than are usually met with in this class of subjects.—*The Old Mill* (54) and *View on the Don* (55) are by the waxed-paper process, by J. F. White, Aberdeen. The latter especially is fine in composition.—Nos. 65 to 69 are foreground studies by Messrs. Ross and Thomson, Edinburgh. They are by the wet collodion process. *Cupid* (69) is a beautiful boy, sweetly posed, with fine expression and delicately caught, a perfect model for such a picture. These gentlemen do not exhibit in Edinburgh, their local *habitat*, but they have abundant material, and of the first water, both as regards splendid composition, excellent manipulatory skill, fine tone, and exquisite detail. Their quota is quite superb. Nos. 106 to 135 are also their productions (eighteen or twenty of which were taken this season), consisting of bramble, furze, nettles, dock-leaves, fox-glove, and other wild flowers; as also studies of stems, with and without branches, of the sycamore, lime, larch, beech, ash, and willow trees; mountains and glens of Caledonia, &c. Pity that such a collection should be lost to the Edinburgh public by the mal-arrangements of the Photographic Society of Scotland! These productions have a peculiar softness, not matched by any other single figure studies in the room. The nearest approach to them is perhaps by Mr. Rae, of Banff, in his portrait of the *Countess of Fife* (327), which has been placed in the centre of one of the screens, and is really a beautiful and successful photograph.

In No. 74 there is a capital sample of photography in a path not hitherto much trodden, where its aid will be of incalculable service. It is a portion (so to speak) of a *Locomotive Engine and Tender*

constructed for the Viceroy of Egypt, and gives an excellent idea of its covering and ornaments — almost of its colour. "*Puffing Billy*," *the first locomotive used in the north of England* (72), is also worthy of notice. Both are by T. Worden, Newcastle. — Nos. 96 to 99 are small vignettes of castles in Banffshire, by A. Rae, printed with great taste.

The *Bridge of Feugh* (153), and *Reach of the Dee* (155), are the only two I notice of R. Fenton's, and I am sorry to see they look a little yellow and faded. The same remark applies to a very interesting panorama of Algiers; but now that old hypo' has been thrown to old Harry, I am confident that we shall have fewer complaints on this subject in future.

Nos. 176 to 185 are some interesting subjects from Orkney, by the Earl of Caithness; and although the negatives appear to have been *rather* thin if anything, still for *a Lord* they are very creditable productions.

Nos. 230 to 242 are enlarged photographs from microscopic objects. To unscientific persons these appear to be of great interest, and more instructive and useful than the micro-photographs taken by the other end of the instrument. I marvel that this branch of photography has not been more largely cultivated, especially by amateurs.

Next in the catalogue comes a long list of portraits of public men, by Maull and Polyblank, which do not call for any remarks, as they have been all previously exhibited. The shrewd intelligent look of Sir D. Brewster has been beautifully caught, and the quiet dignity of the Earl of Rosse—not a King-made Peer, but every inch a Lord in the proper sense of the term.

There are also some good portraits by J. Valentine, Dundee, especially Dr. Nimmo (276), which is good in tone and successfully posed.

Two groups, each containing about a hundred heads of canny Aberdonians, are by G. W. Wilson, of Aberdeen, whose stereographic slides are so much admired by the editor, and well they may be, for they are peerless in this region of the globe, and far eclipse all the misty, muddled, waxed-paper be-medalled productions of the Scottish Society. — There is a frame of excellent portraits by Mr. Moffat, Edinburgh, which have been previously exhibited and favourably noticed by you on a former occasion.

None of the great London limners — as Claudet, Williams, or Kilburn — have sent any specimens of their productions.

Nos. 294 to 299 are *Sea and Cloud Views*, by G. W. Wilson, which more profitably occupy the space than a row of heads which have little interest but to those who know them. These were specially noticed by you in January last, and maintain their superiority to any in the same line yet produced.

Old Tom, the Highland Gaberlunzie (303), by Horatio Ross, is a very quaint successful sketch of a picturesque Highlander.

The Wayfarer, by Rejlander, is a large figure study, posed as Rejlander *only* can do it. The detail of this picture is exquisite — the veiny hand, the wrinkled forehead, the plaited smock, are perfection, while the general tone of the picture I think surpasses anything he has done before. The figure is seated by the wayside, in the attitude of eating fruit, while the hat is reverently laid aside, and the head bared during the scanty meal, and is a good representation of Walter Scott's "Old Mortality." The brown felt hat reclines on the bundle, while the staff — his travelling companion — is hooked through the loop of the tie. — "*Speed him well*" is another composition from the same hand.*

Nos. 315, 316, 331, 334 are views in Edinburgh, by Taupenot's process, by W. D. Clark. These were exhibited previously in Edinburgh, and are the finest photographs I have seen by that process, having nearly all the softness and delicacy of wet collodion.

No. 410 is a series of portraits taken in 1842, and fixed by immersion in weak water of ammonia, by R. Adamson, St. Andrew's, and are not the least interesting portion of the Exhibition. There are also some portraits taken by Fox Talbot's original process, and after *seventeen* years they are as fresh as if they had only been done a week ago.

In another room there are some pieces of apparatus exhibited, in the shape of cameras, baths, &c., by Murray and Heath, Skaife's pistol camera, as well as some of De la Rue's wonderful photographs of the moon, and some excellent achromatic stereoscopes by Smith, Beck, and Beck, of Coleman Street, London. It is quite a treat to look at one of Wilson's fine stereo views in one of these.

But I must now finish, as my notes are already too long, and if I have missed any thing worthy of peculiar notice, you must blame the crowd and not me.

SEL D'OR.

* These two productions of Mr. Rejlander have very recently been noticed by us at length. — Ed.

Meetings of Societies.

LIVERPOOL PHOTOGRAPHIC CLUB.

The ordinary meeting for the month was held at the rooms of the Liverpool Photographic Institute on Tuesday evening last.

Mr. Keith exhibited the proofs of twelve exceedingly fine views that he had taken of that majestic ruin, Furness Abbey, in company with two friends, in the previous week. Though so numerous, and taken in only two days, and several of them by means of unusual exposure, it would be impossible to particularise which was of most singular beauty, — even up to the edges of the plates, though so large as twelve by ten inches.

A remarkable peculiarity was elicited during the taking of these views, namely, the prolonged exposure that wet plates were capable of without the haloide salts crystallising on their surface. As the light gradually faded, the exposure was so much extended that the later pictures were fifteen minutes in the camera, beside the time occupied in coming and going through the grounds from the operating tent (in this case a very cleverly contrived barrow) to the camera.

Mr. Keith also submitted to the members several pieces of paper from the mills of Messrs. Pirie, of Aberdeen, which had been expressly manufactured for this Society. It was exceedingly fine in its surface and equable in its texture, but pronounced not to be so free from spots nor so nearly what is required as some that was shown by Mr. Corey, from the mills of Messrs. Hollingsworth, also prepared for this meeting. Pieces of each were distributed for the ultimate judgment of the members.

At a previous meeting Mr. Burgess, a former member of this Society, gave an animated description of the experiences he had had in a recent voyage round the Cape, in the *Imperatriz*, for the purpose of laying the Red Sea cable, the major part of which had been successfully performed under his direction, as the sole electrician on board that ship. After describing his departure, and many experiments subsequent to his sailing from hence, he says:—

"At Madeira the results were much the same as in this country, but I found no one at Funchal practising photography on our outward voyage, though one made his way there before we returned. A few days after leaving the Island light was much quicker in action, and a good negative might be taken in two or three seconds in the shade.

"At the Cape of Good Hope (Cape Town) the light was to all appearance very good, but the time required was nearly one minute with single lens. Here I found it very difficult to get large plates 10×12 free from spots. Filtering the bath did not much improve it. The contrast of light and shade is very marked, for a great number of the buildings have flat dull roofs and white walls, and the mountain tops were enveloped to some extent in mist. I found here a number practising the art — one an English chemist, who gave me every information. From the Cape we proceeded to Aden. Here the contrast of I may say everything was considerable—from a fine, rich, and beautiful place, to a bare, barren, volcanic soil, nothing but sand and rock, with intense heat, and a dazzling sunshine, in which you might say fifteen seconds would be sufficient exposure. From the accounts of photographing in the east, I expected a minute would be sufficient in the bath, the thermometer being about 100°, but I found five minutes quite little enough. Then came the exposure: I gave thirty seconds but found scarcely a trace of anything upon developing; the next I exposed one minute and found not so bad a positive, but when I attempted to wash it the result was a plate covered with chloride of silver. After a few trials I found it of no use to proceed, as the water was so salt I could do nothing. There is no water here but what is condensed from the sea, and very bad it is. It is quite impossible to get any rain water, for the most rational of all reasons, it never rains in this place. I had to return to the ship and bring water the next day. Our own from the ship was salt water condensed, but it was very good.

"On getting to work next day I found two minutes with a large stop in rather little enough time for exposure; the light acts very slowly, from the angle of reflection being nearly vertical. It is very yellow, and the sand does not add to the reflection. The buildings are much the same as the sand, so it is difficult to discern a distinct outline, even with the eye. I also found here a countryman, a photographer. His experiences exactly agreed with what I found. The best negatives were taken late in the day; and early or late, I have no doubt, would give the best pictures. Proceeding up the Red Sea as far as Suez the results were much the same, with Thomas's collodion, Ross's lens, new bath and collodion, which

came overland. I found by adding oxide of silver to my bath, as formerly recommended by Mr. Glover, it in a great measure prevented specks or spots. I had made my own collodion, and I liked it better than any other; but you here see pictures taken with both. On returning home I found that several things were affected by the sea. Test papers were quite red; gun-cotton would neither dissolve nor burn; printing paper was also to an extent spoiled. I do not think collodion suited for such very hot places; I believe albumen would be much better. It is very difficult to get apparatus to stand on board of ship, where agitation is constant and damp prevails. On land every place is hot, thermometer 100 to 130 deg., and everything is roasted."

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE first meeting of this Society after the summer vacation was held at the Chorlton Town Hall, on Wednesday, the 14th ultimo, Mr. HOOPER in the chair.

The minutes of the last meeting having been read and confirmed,

The SECRETARY said he had received from Mr. Keene two photographs as a contribution to the Society. He begged to move "That the best thanks of this meeting be given to Mr. Keene for them."

This was seconded by Mr. WARDLEY and carried unanimously.

The CHAIRMAN said the photographs were very remarkable for clearness and absence from stains in the negatives, and were as good specimens as he had seen by the Fothergill process. He would ask the members to contribute to the portfolio of the Society any good prints that they might have negatives of.

Some members complained of the difficulty of working this process with certainty, and said they could depend better on collodio-albumen; others thought it only required care to succeed.

Mr. NOTON exhibited a machine for frothing albumen, which would be very useful where a quantity was required. He said the albumen when well beaten was much more limpid than when that operation was only partially done; and any gentleman was at liberty to try the machine for himself at his own house. Mr. Noton also exhibited several photographs, taken on dry albumen, which were very well defined, he said they had received a long exposure. He also showed to the meeting an arrangement for altering the stops in the lens from outside the tube; the stops were square, but produced no effect different from circular ones.

Mr. WARDLEY exhibited a new camera, with folding body, very compact and portable, lately introduced by Mr. Mudd; also a photograph taken by it, with an orthoscopic lens, exceedingly sharp to the edges and the lines very perpendicular.

Some conversation on the strength of the printing bath resulted in a general opinion that sixty to eighty grains of nitrate of silver to the ounce, kept up to the original quantity by additions of a 100 grains solution to the ounce, gave as good results as any stronger solution, but might not print so quickly.

Some members having seen the waxed-paper negatives taken by the Chairman, and feeling that it is desirable to work larger pictures than the stereoscopic ones, which are exhibited of all kinds in such profusion, requested that gentleman to state his mode of manipulation.

The CHAIRMAN said that he should be glad to read a paper on the subject at the next meeting of the Society.

The usual vote of thanks to the Chairman concluded the business.

PHOTOGRAPHS TAKEN FOR GOVERNMENT INSTITUTIONS.—To enable the public to derive full advantage from the photographic negatives made officially for the Science and Art Department, from rare and valuable objects in public and other collections, British and foreign, the Committee of Council on Education has caused an office for the sale of photographic impressions from such negatives to be established at the South Kensington Museum, which will be opened on the 3rd of October. Photographic negatives, made by order of the trustees of the British Museum, and for the War and other Government offices, will also be sold. The tariff for unmounted impressions will be as follows:—A single impression, the dimensions of which contain less than 40 square inches — *e. g.*, 5 inches by 7, or 4 inches by 8 — 5d. Above 40 square inches, 2½d. should be added for every 20 square inches or under. A detailed list of the objects photographed is printed, price 2d. The department does not charge itself with the mounting of impressions, as the public is able to do this for itself.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. VI.

A FEW days ago we rode down to Jericho and the Jordan by the road over the Mount of Olives, through Bethany, and thence among wild hills. This seems to be the ancient road, and I cannot in my rides find another which would throw doubt on this idea. Doubtless this is the path which the Saviour alluded to when he related the parable of the Good Samaritan, and which he often passed over.

Travelling in the Holy Land must be done entirely in the saddle. The pace is always a walk, and the distance travelled in a day is seldom more than twenty miles. This is when women and children are concerned. For my part I cannot submit to this snail's pace, but like to fly as swiftly as the swiftest of Arabian horses can carry me. A free rein, a knee pressed firmly in the saddle, a keen eye and a cool head, are all that is required to make me equal to a Bedouin Arab on horseback.

I came here under the idea that I should taste freedom, the freedom of the desert, and I turn my horse's head as it suits me, now here, now there, taking my chance of finding a bed, or at least sleep in the Arab's tents, and I can even take my rest when the black tent is inaccessible.

I started off early in the morning. Our tents were struck at daybreak. The Valley of Jehosaphat had a deserted appearance, desolate and mournful, as it usually is, when I looked into it from the winding road that goes around the eastern side of Mount Olivet, and I missed the familiar home that I had occupied so many days. We went through Bethany at a gallop, and were soon in a dark ravine among the hills, down which our course lay. We got lost, but how it happened I know not; but we did get lost, and that too in the worst of roads, celebrated for its thieves now as of old.

We passed the night in a queer place. I think it must have been once a castle of the Crusaders. It is a fine ruin, crowning a lofty hill, and commanding a vast prospect. No foot of civilised man can have been in it, except it be of wanderers like ourselves, for centuries. Seeing it from a distance, I pressed forward to it as the night fell, crossing three of the deepest ravines and as many sharp ridges before I reached it.

In the grand court of this old castle we found a pile of dry brushwood, to which we helped ourselves. It had doubtless been collected by the Bedouin women. If ever I meet them I will pay them. In a little while we had a blazing fire in the chief room of the old building. I call it room, for such it once was, though now the floor is turf and the roof is sky. The scene would do to paint but would make nothing as a photograph. I slept soundly under the side of a rock, a long stone which had once done duty in the wall, but now served as a wind breaker to a houseless wanderer. John grumbled occasionally, but upon the whole we did well. I have seen worse quarters.

In the morning we found the road, striking it near a ruined khan, and in three hours' time opened that splendid landscape, the Valley of the Jordan and the Dead Sea. Far down below us it smiled like a valley of heaven, rather than the deep sunken place of the curse of God.

The solitary tower which marked the site of the village of E'Rihah, the sole representative of old Jericho, was visible in the plain. The gorge of the brook Cherith on our left went plunging down and down to the valley, where it was spanned by two ruined stone bridges of ancient days. All was grand, magnificent, and solemn around us; all was exceedingly beautiful, calm, and glorious beyond, even to the mountains of Moab, that rose majestic across the Jordan.

We descended rapidly to the plain, emerging from the gorge of the brook on a high platform, which occupied the western side of the valley. This let us slowly down to the true valley level, and a gallop of half-a-mile to the northward brought us to the Fountain of the Sultan, where we pitched our tents.

The fountain, a noble gushing stream, is doubtless that healed by Elisha, when its waters were bitter. It lies a mile or more from the modern village, the representative of ancient Jericho. I think it probable, however, that the ancient city was near the fountain; for ruins of old buildings lie scattered here and there all along the hillside. The high bluff of the mountains which overlook the fountain is dignified by tradition as the place of the termination of the forty days' temptation in the wilderness, and the high hill whence the Saviour saw the kingdoms of the world and the glory thereof.

Jericho is a desolation. It lies as prostrate as when the walls fell before the trumpets of the children of Israel; nor from that fall to the present day has any man, king or slave, prevailed to

build again the accursed city. Herod's city was not on the site of the ancient Jericho, but nearer the mountains. The plain is four or five miles broad between the hills and the Jordan.

Early in the afternoon we were in the saddle, and rode at a gallop across the plain to the sacred river, reaching it at the spot where the pilgrims come annually to bathe and wash away their sins. It is a sight well worth coming thus far to see.

The pilgrims who throng Jerusalem at Easter are chiefly Armenians, though there are many Latins and Greeks. They form a vast assembly, and one of the requirements of the pilgrimage is a bath in the Jordan, and a dipping therein of certain garments wherein they expect to be buried. Indeed this is the great end of the pilgrimage. Hence the camp-ground of the pilgrims and the scene at the river are among the most interesting views that a travelling artist can take away with him.

If the Jordan could so wash away sin, I am a clean man, soul and body; for I have bathed seven times in its icy water. It comes down cold and fierce from Lebanon and the Sea of Galilee, and its waves are as chilly as the waves of that river it is so often made to typify.

Perhaps I have lost the blessings of the Jordan by my many dips in the Sea of Death. I cannot now stop to describe the Jordan Valley nor the Dead Sea. We rode down to the shore of the sea in the twilight: Hassan was anxious lest the Bedouins of the Ghor should take the night to attack us, for we had paid no tribute, and were therefore proper prey. I had invited the Sheik of the Ghor, however, to meet me in the evening, intending to pacify him with an appropriate backsheesh; but he might be impatient, and it was hardly safe to trust ourselves out after dark in the valley.

We flew like lightning across the dry dusty plain, over which the Jordan had but lately swept in its spring overflow — pausing on the shore of the Sea of Death only long enough to taste its bitter waters, and to see the long black shadows of the mountains of Engeddi stealing over and taking possession of the sea, with a pomp that signified how totally it was given over to darkness and the powers thereof — over the plain to our tents by the Fountain of Elisha.

The Sheik of the Ghor Bedouins and a dozen of his tribe were waiting for us at the camp fire. Wild, fierce, and fiendish did they verily appear in the flickering light. But the Jordan Arabs have not had such a feast for years as I gave them. I had a sheep killed, and they ate like lords (lords eat only mutton in the East); and when they were filled to satisfaction, I made a compact with them, then and there, swearing eternal amity between all the Bedouins who inhabit the Valley of the Jordan and all the followers of the high and glorious Sheik of Lancashire who shall henceforth visit the valley aforesaid. Much good may it do you, oh traveller! But be warned: if you do not make treaties on your own account with mutton and with money, the hounds of Ishmaelites will take no evidence that you are included in former treaties, except such evidence as you may be able to give out of the muzzles of your revolvers.

The next day I loitered around the head of the Dead Sea. Shall I repeat to you the often-told stories of its strange character? How it floated me high up when I bathed, and stung me furiously in my eyes, and in every pore of my skin with its sharp acrid salts? I was glad to wash off the glistening salt which a morning bath left on my skin, by dipping myself for the eighth time in the Jordan.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER V. *(continued)*.

THE HANDS.

A little white, to strengthen the shining lights upon the knuckles, is first used; then a little carmine for the nails, knuckles, and other pinky portions; and then a little pale blue for the veins, leaving the other tints for the present.

DRAPERIES.

Begin with the lighter folds and darken as you soften into the shadows; in silks and glossy fabrics put in the highest or whitest lights with a tint very little removed from white, by which the effect will be much enhanced in the finished picture.

BACKGROUNDS.

If your picture is small, a plain background with a light about the head to secure breadth is best. (See Maxims No. 16 and 52). If a larger picture you may introduce a background of clouds, sky, and distance, with very good effect; curtains and architectural objects are also frequently introduced. (See Maxims 50, 51).

SKY AND DISTANCE.

If the positive has a darkish grey background, it will with a few touches of various greys (greenish, brownish, and bluish), be converted into a very artistic "bit of distance," the horizon tint being used to form its boundary. Work this tint (the horizon) upwards into a pale warmish grey, and this again into the high lights of warm white, or small fleecy streaks of fleshy clouds, or into the azure. If desirable, the sky may be composed entirely of pale and dark, warm and cold greys, which form a very effective background to a vigorously-marked head or military costume. Curtains are seldom nicely managed; but architectural objects may be touched in with greys and browns, leaving the surface of the plate (if dark enough) to form the shadows. Having finished the first colouring, take a clean well-pointed pencil and remove any stray colour which during your progress may have obscured the shadows or outlines.

THE SECOND COLOURING.

If you are using the new absorbent colours, breathing over the plate and permitting the moisture to evaporate is sufficient preparation; but if not, your next step is to varnish the picture, as the first colouring is on the collodion itself — for which reason, by the bye, great care should be used to avoid scratching the plate by rubbing it too hard, or suffering the quill or tin ferule of the brush to touch the surface.

The varnish having dried, or the moisture evaporated, as the case may be, the carmine — strong or faint as may be necessary — is then applied upon the cheeks; and will most probably also be required, more or less, upon the nostrils, bridge of the nose, lower portion of the brow, and the chin. If a faint blush of colour be required for a very delicate complexion, use a little of pink No. 1, with or without a touch of carmine; or should the pure carmine be too bright and powerful, combine with it a little of flesh No. 3; or again, should it approach scarlet, add a very slight touch of pure orange. Take the colour labelled "horizon," and with white, mix a warm pale tint to strengthen the high lights, making it more or less white, or more or less yellow, as may be most consistent with the local colour of the flesh; and this done, the retiring shadows may be slightly and carefully touched with a warm grey, compounded of flesh No. 3 and green No. 2. Finish the hands with flesh No. 1 and pink. Repeat the colouring of your drapery, avoiding the darkest shades — using, however, a pale tint of the local colour for the highest lights instead of the light tint recommended as a ground to strengthen their effect in the first colouring.

TO COLOUR A VERY DELICATE FAIR FACE.

Use white for the high lights, place the pale horizon tint next to this; then blend this into a third tint, compounded with the second and a little carmine; and this again into a fourth tint, composed of flesh No. 1 and a little blue. This treatment should also be adopted for ladies' hands, necks, and bosoms.

TO COLOUR A VERY DARK FACE.

Use for the high lights a strong tint of orange and white, blend this into a second tint of orange and carmine, and this into a third, of warm brown, orange, and carmine, reducing the whole, if too brilliant, with a tint composed of carmine and green.

THE EFFECT OF VARNISHING

Is to modify and subdue the first colouring — which should therefore be more brilliant than the second — and according to the quality of the varnish, to lower the whites, which consequently require some few light touches of white to indicate (as the photograph itself seldom does) the high lights of linen or white drapery. Certain colours, also, are affected to no small extent by the varnishing, some being rendered very much too strong, others being almost destroyed. Those least affected are the yellows, reds, and greens. A little practice will however best explain this difficulty.

SCARLET COATS AND JEWELLERY.

In colouring a scarlet coat with powder colours, your great difficulty will be found in preserving its folds and roundness, the opaque nature of your pigments* destroying the half-tints and shadows in the same degree as they produce the force and brilliancy damanded for a truthful effect. In this case, therefore, more than common care is requisite. Select a colour for your high lights first. This should be a scarlet of a somewhat orange tone; and be

* To claim transparency for powder colours, in themselves, is a common mistake. When ground to an impalpable powder and slightly applied, they, by the mere fineness of their particles, *seem* almost transparent, but of course cannot be really so.

careful that in obtaining it you use *no white*, which would effectually destroy the purity of your colour. The next colour is the local one, viz., scarlet, the next carmine; and the shadows are coloured with crimson, which upon *the darkest shades* should be applied *before varnishing only*. You will find that the local scarlet is a colour somewhat difficult to meet with. I obtained a set of very excellent scarlets in a box of the new colours introduced by Messrs. Reeves & Sons.

Jewellery is too generally touched with the gold and silver sold in shells, which, unless used with no little skill, produces a very coarse and untruthful appearance. The simple fact of the jewellery thus touched having lights and shadows of its own continually varying with the light in which the picture may be placed, and perfectly independent of the light and shade upon the image itself, should denounce the vulgar taste displayed in its use, and confine it to the studios of a class of "photographic artists" who laud the fact of its being "real gold" to their sitters as an inducement for the outlay of "tuppence" more for a ring, or "sixpence" for "a gold chain." I have seen a minute touch of the silver applied with singularly good effect to the spark of light in the eye, but it perishes as the silver blackens. *Gold* is best executed with water or oil colours. In this case take Naples yellow No. 2 for the high lights, yellow ochre for the local colour, bistre and burnt sienna for the shadows, and orange chrome for the reflected lights. *Diamonds* are best represented by a vividly bright touch of pure white (water colour), and coloured stones by the same upon the local colour, opposite a touch of this local colour mixed with white, to represent their transparency. For *silver* use white for the lights upon a ground of warm pale grey, with somewhat warmer shadows. For *pearls* use a brilliant touch of white, very minute, diagonally opposite another similar touch of white and Naples yellow. *Coral* may be painted in with lake and vermilion for the local colour—pure lake for the shadows and pure vermilion for the lights, the highest lights with the same and a little white.

Letters to a Young Photographer.

No. XX.

MY DEAR EUSEBIUS,

Not every bird that sings is a nightingale, nor is every one who paints an artist. I wish particularly to draw that distinction. In most boarding schools, young ladies are taught to draw and paint, with what result, in an artistic point of view, I need not stop to dwell upon: their productions fitly rank with those other artistic results of young ladies' ingenuity — crochet, samplers, and Berlin wool. I cannot recognise a man to be an artist unless he possess a natural genius for his vocation: we may produce any number of painters as we can adepts in any other calling, be they tailors, carpenters, or shoemakers, by "sticking to it" for seven years or more. Take any boy of average talent, and teach him to draw and paint, and he will, by diligent plodding, manage to eke out a subsistance. Every year his crude productions will help to cover the walls of the exhibition room, and if the subject be "taking," may sell; but shall we profane the word by calling him artist?

I have been a regular attendant upon the Royal Academy Exhibitions for a quarter of a century, and I am lost in wonder when I reflect that, of the many thousands of pictures I have seen there, how few have excited more than a passing tribute of admiration—how few have taken hold of the imagination, or left a strong impression on the memory. One exhibition is so like another that when you have removed the productions of the few who are worthy to be called artists, the rest is mere manufacture, the production of painters who, because they paint, arrogate to themselves the title of artists, a title to which they have as little claim as the author of "Hoop de dooden doo" has to be called poet.

Not every rhymster is worthy to be called poet, neither is every painter artist. I maintain that the true artist, like the poet, is born, not made. Culture is, of course, required to develop and perfect both; but no amount of culture will supply the place of natural genius. We value a picture or a statue for the thought it utters; the execution is a secondary consideration. Some of the greatest artists that ever lived have lacked the power to employ the highest mechanical resources of their art; but an idea extensively prevails now-a-days that execution is everything, hence the excessive mannerism of most of our artists, and one-half the time of many painters is spent in searching for the "lost medium" of the old masters. In their simplicity they think it was by some mechanical agent, some oil or pigment, that Titian, or Reubens, or Rembrandt, became as great as they were.

I have instanced Gainsborough as one of whom the British School of Art has great reason to be proud. His execution may be objected to, but that is of little account in connection with my subject; I maintain that, in all the intellectual qualities that constitute the true artist, he is worthy to rank with the greatest of any country or period of history. It is not in his landscapes or rustic subjects that his peculiar excellence is shown, but in his portraits: he is one of the very few that could portray the soul as well as the body of his subject, the spirit that informed the features, the character, the everything that animates and gives life to matter. I think I have never seen this quality so strongly exhibited in any other artist, besides Raphael. Gainsborough fell upon evil times, when the pursuit of art was a mercenary calling, and his genius, in consequence, never had fair play.

The painter's inspiration, like the poet's, comes from within. He can utter only the thoughts that lie within, and his works speak to us, and command our attention, in proportion to the depth, power, and extent of his thought. Now it is easy to produce any given number of pictures which utter no thought whatever — which are of the earth, earthy; but let not such works be ranked among the productions of true artists.

We have thoughtful artists among us, whom it would be invidious to name: whose works are prized at their true worth; but then, again, there are others as highly esteemed by the connoisseur and the public whose chief merit lies not in the thought, but in the dexterity, the sleight of hand, the execution, of their works. The latter enjoy only an ephemeral popularity, and must in due time find their proper level. The former have had to wait patiently for their merit to be recognised.

Art is a representation: it represents by means of outline, form, or relief, and colour. The power and resources of outline, as a means of communicating the thought or idea, is shown in great perfection in the pure classicism of Flaxman, and in the romanticism of Retzsch and the American Darley.

In the outline illustrations to "Margaret" the power of expression by outline is carried to a degree of perfection which leaves nothing to be desired in delicacy and completeness of representation. They place Mr. Darley in the foremost rank among living artists.

In the representation of form or relief, apart from colour, we have rare examples in the works of Kaulbach. Witness his "Battle of the Huns," his "Fall of Jerusalem," his "Prime of Greece," his "Reynard the Fox," which would gain nothing in expression by the addition of colour.

An eye for colour cannot be acquired any more than an ear for music: it is a natural gift which in part supplies the place of the knowledge of nature's laws. Where this faculty, or eye for colour, is deficient, the painter, guided by a knowledge of the laws of the harmony and contrast of colour, may attain very satisfactory results, although he may never become distinguished as a colourist, like Titian or our own Turner. This subject of colour is so vast and profound that I must defer its consideration till my next. It is governed by laws of its own, but these laws were never investigated until within a few years; you will find the result in the excellent work of M. Chevreul.

I promised to speak of *chiaroscuro* in this epistle, so I must bid adieu to digression. By *chiaroscuro* we understand the complete representation of all the lights and shades existing in the model. This is the most complex and difficult branch of the painter's art; as it not only embraces the variations of white light and shade, but also the reciprocal action of coloured lights upon the local colour and upon each other. It is so difficult that few painters have sufficient patience to study it. Most of the Exhibition pictures are deficient in it. You will find the *chiaroscuro* in the various figures composing a picture treated as if each figure were isolated, and the reciprocal action of the reflections upon each other neglected. Without the aid of *chiaroscuro* art would be powerless to represent light. The most luminous pigment is but mud in comparison with the brilliant light reflected from a body illuminated by the sun's rays. You may exhaust your stock of whites and yellows, but you will never succeed in producing light. But paint in *chiaroscuro* all the delicate and obscure reflections suggested by art, and you immediately inundate your picture with light.

In this branch of art Rembrandt is the master *par excellence*. He preferred to represent its effects because he felt them better than any one else; and by uniting study to feeling, and practise to inclination, he has hitherto remained inimitable in *chiaroscuro*.

Chiaroscuro is the principal source of light in the art of painting—the rich mine which the Flemish painters have so skilfully worked; painters who were as great in light as in colour; the first painters

in the world in these respects. It is also of itself a source of poetry; it reveals the hour of the day, its hue, and physiognomy. It enlarges the scene beyond its natural limits. It enlivens the shade and reveals the mysteries of darkness. It is the chief quality in interiors, and an important resource in every kind of scene.

Modern art has greatly cultivated *chiaroscuro*, its resources and effects. Witness the wonderful results in the *diorama*, and in scene painting. It is in the representation of *chiaroscuro* that the photographic art excels and triumphs.

Compare the most finished drawing you can obtain of any object or scene with a good photograph of the same, and you will see how immeasurably superior the photograph is in representing all the various delicate features that constitute *chiaroscuro*. Of course the subject must be suitably selected with regard to colour, else the accuracy of the effect may be marred. The complexities of *chiaroscuro* are so great as sometimes to lead the artist to despair of representing them. *Chiaroscuro* is not regulated by uniform laws like simple relief. An object can be drawn from memory, and very accurately too, by one possessing a knowledge of the laws of relief; but not so in *chiaroscuro*, when all the effects of reflection from surrounding objects influence the model, and render it necessary to study it on the spot.

Suppose the model to be a sphere submitted to these influences, its relief will always express a sphere, but its *chiaroscuro* will vary as you move different bodies around it or move it among them.

If you paint two strips or bands in different colours in flat tints, and place them in contact, an effect in *chiaroscuro* is produced—the bands do not appear flat, but graduated from the line of contact, where there is a contrast of tone or of intensity as well as a contrast of colour, heightened by contact also.

Photographic Glossary.

Thermometer—An instrument for measuring the temperature of bodies. It consists of a slender glass tube, hermetically sealed, having at one end an enlarged receptacle for containing the fluid, mercury or alcohol, with which it is filled, and which is acted upon by heat.

Thermometer Scale—Two points are marked upon the thermometer tube, one at the temperature of freezing water, the other at its boiling point. This space is variously divided: in the centigrade scale, that used in France, it is divided into one hundred degrees; in Fahrenheit's scale, that used in England, this space is divided into one hundred and eighty degrees. The zero of the centigrade scale is the freezing point of water; that point on the Fahrenheit scale is marked 32°.

Tinctures—Solutions of various substances in alcohol or spirits of wine are called tinctures.

Toning—A photographic process by which the image formed by chloride of silver is coloured of various hues of violet and purple by chloride of gold, &c. Numerous formulæ have been at various times given in this Journal, the best of which is that proposed by Mr. Maxwell Lyte.

Tripod—A piece of apparatus constructed for supporting the camera obscura. It is of various forms and patterns, but the principle is the same in each. Any three-legged support may be called a tripod.

Tripoli: Tripoli Powder—Fossil infusoriæ used for polishing daguerreotype plates, glass plates, &c. It appears to consist principally of silex.

Turpentine—An exudation from the pine tree. By distillation and rectification it assumes the form of a white, transparent, volatile liquid, of a peculiar odour. It is very inflammable. It dissolves wax, the resins, &c., and is a useful ingredient in varnishes. When submitted to a higher rectification it becomes lighter and more volatile, and is called camphine.

Foreign Correspondence.

Paris, September 27, 1859.

On a former occasion I mentioned that some very curious and unexpected results had been arrived at in M. Nièpce's experiments on the chemical influence of light upon solutions of starch, &c. In conjunction with M. Corvisart, he has published a report of these experiments, which, it appears to me, are of sufficient interest and importance to form the subject of a communication to you. They state the following propositions, and some of the conclusions derivable from them:—

Solar light, by its own peculiar action, modifies and transforms certain amylaceous substances and some of their educts.

The sole but prolonged action of light transforms starch, pure and dissolved, into dextrine and even sugar. But light first profoundly modifies the nature of starch, and changes it into a substance resembling inuline—which, when cold, is quite insensible to the action of iodine—but which otherwise differs from it in not reducing the salts of copper and silver in presence of ammonia, and it does not turn the plane of polarisation. This change may be produced in a solution of starch after a solarisation of six hours in the month of July or August; but it often requires fifteen hours' solarisation to produce a complete effect. Starch, protected from the solar influence, but exposed the same length of time and in the same place, undergoes no change, but immediately becomes blue by the action of iodine.

This transforming action is impeded by the lactates, and by citrate of iron: it is entirely prevented by bichloride of mercury.

The potasso-ferrié-tartrate augments the transformation, both in the light and in the shade, but at least one-third more in the light.

Nitrate of uranium powerfully favours the action of solar light, which becomes five, six, and even seven times greater: it is also more rapid, and the quantity of starch transformed is greater. The three kinds of transformation of starch indicated above take place:—First, iodine ceases to colour the cold solution of starch, but there is no polarimetric deviation, less appearance of sugar, and very little dextrine. The same amylaceous substances, protected from light but exposed in the same place, remain unaltered.

The acids of the preceding salts in feeble solution (two per cent), *i. e.* nitric and tartaric acids, prevent the light from exercising its usual transforming action. Oxalic acid has the property of accelerating and rendering more intense the change in the starch (as shown by the action of iodine) under the influence of light. Its action is comparatively *nil* in the shade.

Whatever it be, unique or primordial, primary or secondary, the cause of the changes described is light.

Dextrine is rather a product of art than of nature. Dextrine obtained by diastase does not reduce Bareswill and Fehling's reagent, and undergoes no transforming action from solar light. None of the bodies studied appear to develop this influence. Yet these same bodies, without light but with the presence of heat, are suitable to profoundly modify this same dextrine, as much as ordinary heat differs from solar light in its effects upon organic bodies.

Cane-sugar undergoes no transformation from the action of solar light: substances like hydrochloric acid and nitric acid, which modify it profoundly, act as well in the dark as in the light. Nitrate of uranium effects no more change upon it in the light than in the dark.

With concentrated sulphuric acid it requires a boiling temperature to decompose oxalic acid, one of the educts of starch: without concentrated sulphuric acid, it requires a temperature of 248° F. to 375° F. to disengage the oxide of carbon. Oxalic acid diluted to one twenty-fifth, in presence of nitrate of uranium one per cent, boiled or kept in a stove for forty hours at a temperature of 104° F. does not disengage a bubble of gas, if it is kept in the dark.

When it is exposed to the light, even diffused, upon raising the cover of the stove, the mixture remaining at 60° F. or 68° F., the decomposition begins. An hour's good solarisation furnishes an abundance of inflammable carbonic oxide gas.

Direct experiments show that animal fecula (glycogene) is transformed into sugar more rapidly and abundantly under the influence of light than in the dark. But nitrate of uranium hinders, not accelerates the solar influence upon animal fecula.

Animal fecula, like vegetable fecula, remains in the liver of frogs during winter without becoming sugar. The period of greatest richness of sugar in the liver of these animals exactly corresponds with the period of the maturity of fruits: the end of June, July and August. The glycogene may remain unaffected in the liver (like starch in the tubercules of grain): if the frogs are entirely protected from light then they produce no sugar.

We can now explain how the abundant presence of glycogene in the cutaneous tissue of the fœtus disappears from that tissue immediately after birth, by the sudden transition from darkness to light.

The actions of light sketched above are generally slow. We know also how this action of light, daily feeble, in time effects the formation of corn and the ripening of fruits, &c., nevertheless, it is powerful, as a whole. Therefore if, without augmenting the light,

certain substances double, treble, or sextuple the effects of the solar action—for example, in the formation of animal or vegetable sugar —and if, on the other, without diminishing the solar intensity, other substances annihilate or hinder its effects, as, for example, starch under the solar action—we cannot doubt that analytical studies in this direction must be very serviceable both to agriculture and to vegetable physiology, and perhaps even to medicine. It is only necessary to refer to the influence of solarisation upon scrofula and diabetes. We know very little, for instance, of the phenomena of nutrition. An experimentalist on these phenomena met with the following curious incident:—He took some starch saturated with iodine and placed it in his garden in a pot imperfectly covered with a piece of wood, where it remained for three months exposed to the sun. Upon opening the vase he was astonished to find in it some scores of snails attracted from all parts of the garden. Continuing the experiment, he saw during even the greatest heats of summer the snails daily travelling towards the pot. They were attracted by the iodine and not by the starch. He is of opinion that if a quantity of sawdust be saturated with a weak solution of iodine, it might be made the means of attracting these pests of the garden to their own destruction. The process is not costly, as the iodine, notwithstanding its volatility, retains its efficacy for years. Snails and slugs are a popular remedy for consumptive patients, may it not be from the iodine that they, probably, eliminate from the soil and certain plants? J. P.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

"AUDI ALTERAM PARTEM."

A FEW WORDS IN FAVOUR OF BRITISH ART AND ARTISTS.

To the Editor.

Sir,—Will you permit me to offer some few remarks in connection with the two last letters addressed to the Young Photographer, "Eusebius," who being pulled up so suddenly and unexpectedly when in the midst of a successful career in pursuit of a favourite art, to listen to a prosy lecture about a "sixth sense," and the present fallen and unhappy state of "British Art" and Artists, is, I am sure, a fit object for our sympathising pity.

I, sir, am a member, unfortunately, of that degenerate race "mostly slaves of convention," who worship the "golden calf, Art," and are called "artists;" but, alas! I must lay down the brush, relinquish my dear old palette, and turn with a sigh from the tempting canvas, for I have only five senses—only five!—and consequently cannot be an "artist born." It is certainly true that I don't know what this "sixth sense" is, or how its existence is demonstrated, as I innocently imagined that the cultivation of my mind generally, and the education of my imitative and perceptive organs more particularly, were the origin of the feelings which took possession of my heart when in the presence of nature's glowing beauties, and of the power I have acquired in expressing them.

With regard to the missing "bump" not "mapped down by phrenologists," and several times refered to as the "art faculty," a phrenologist would inform the writer of these letters, doubtless with a smile, that the perception of the beautiful is a perfectly distinct thing from its imitation, and that what he terms a "faculty for art" has its origin in the combined powers of certain organs or "bumps," called respectively ideality, imitation, form, and colour, aided by the reflective and perceptive faculties. Thus it is that many possessing certain of these qualities and wanting others "enjoy the beauties of nature" thoroughly, but cannot "utter what they feel, either by pen or pencil;" and others, copying nature with the fidelity of a machine, devoid of all feeling, yet arouse by their productions lofty sentiments and poetical feelings in others differently organised.

Is not this "letter writer" *rather* too bold, if, as he says, he "cannot arrogate to himself any special knowledge" to make the sweeping assertions, that *he* has generally found "art teachers to be blind leaders of the blind," and that "the British school of art in this middle (has it any other?) of the nineteenth century, has no better representatives to hold up to the admiration of posterity than the so-called pre-Raphaelites." I think there are some artists belonging to "this middle of the nineteenth century" *not pre-Raphaelites*, to whom "the admiration of posterity" will be very probably awarded, viz., Turner, Stanfield, Maclise, Landseer, Mulready, Creswick, Harding, Leslie, Frith, and others painters who as readily threw aside the eccentricities of morbid novelty as they did the glaring conventionalities which deface the pictures of that lover of attractive "shams" and idle method, *Gainsborough*—an artist who, with nature at his elbow, could compound a landscape with a little earth, bits of stick, some weeds, stones, and a piece of looking glass, and *paint from these*—many parts of whose pictures are about as true to nature as the conventionally antique and formally stiff outlines of *Flaxman* are to beauty.

In the last epistle I find it asserted that "nature is dumb and inert matter," and that (the golden calf) art clothes it in thoughts, and gives it a language. Nature *dumb!* Oh! Shakspeare! how mistaken you were in supposing there were "tongues in trees, books in the running brooks, and sermons in stones!"

In conclusion, I must just say something in favour of colour, which, without disparagement of its twin sisters, outline and relief, is by no means the least of the three.

We have many excellent draughtsmen, very few good colourists; this is a well known fact. Now how do we account for this, that colour, a picture's most popular and attractive quality—as witness the desperate attempt to supply cheap coloured prints, and the success which has rewarded the most feeble steps in that direction—should be in its comparative perfection the rarest acquirement of the most gifted artists? Is it because it is easiest or most difficult, most attractive or least attractive? I will give you what, if I mistake not, is the reason. The art student begins to draw, and from every quarter is assistance proffered. Here are minute and accurate measurements, treatises without end, systems innumerable, and whole libraries of books to assist him. Thus aided, and with moderate ability, he succeeds; outline and relief are mastered, and he turns eagerly to the crowning glory, the poetry of his art—*colour.* But now he looks in vain for aid: no figures, no clearly defined principles, no easily acquired systems wait his beck or come at his call; he is alone. Severe thought, indomitable perseverance, long and tedious practice—these are now the only roads to the goal of a successful colourist—a goal which most probably he never reaches. Well, you know the old fable of the fox and the grapes. Nothing is easier than to decry the merit we do not possess. The old Roman artists, who could draw grandly but coloured villanously, of course scorned colour, saying design and drawing (*their best qualities*) were everything, colour (*their worst*) nothing; that the latter was useless without the former, &c., in short, just what the master of "Eusebius" says in his last epistle.

In attempting to defend British art and modern artists from what I think injustice, I would not be understood to deny the ability displayed by the author of these letters in his reasoning and deducements relative to outline and *chiarooscuro*, but simply to express a contrary opinion relative to the present state of art in this country, as compared with the conventionalities displayed in the works of two examples so highly lauded in his letter, and to show why I think he has not been quite just to the important aid of colour. Some of this writer's remarks deserve high praise, but others aroused in me a warm feeling of indignation, under the impulse of which I confess that I write the present letter.

Apologising for the time I have occupied, I am, yours, &c.

AN ARTIST.

[Upon the principle of giving *both sides* of an argument a fair hearing, we usually insert anything which we receive questioning our own judgment: we can do no less with regard to that of one of our *collaborateurs.*—Ed.]

FADING OF NEGATIVES.

To the Editor.

Sir,—Whilst much has been written on the fading of paper pictures, I can find little or nothing on the fading of those on glass; yet in my experience I am sorry to say I have lost many choice ones, negative and positive, in that manner—indeed, nearly all that I have had any time are thus more or less spoiled. They become spotted and streaked, from the margins gradually over the whole plate, though sometimes stains appear in the centre first. The film likewise often cracks in several places, as if cut with a knife; and the varnish sometimes comes off as a fine powder.

I endeavour to take every care in the manipulation. The chemicals are of the best. The varnish is amber and chloroform, not applied until the plate is thoroughly dried. The hyposulphite is well washed off after fixing: in short, I cannot find any cause, unless it be a hygrometric state of the glass, which is always damp, though kept in a deal or walnut wood box, in a warm room. If I dry the back at any time, it becomes damp again very shortly, and this, I conceive, takes place on the other side as well, and thus affects the film.

It is very vexatious to lose one's best negatives in this way; and I shall feel much obliged by any explanation and remedy, and should like to know if others suffer in the same manner.—I am, yours, &c.

Bristol, September 16, 1859. MEDICUS.

[You have not mentioned what kind of glass you employ; but if, as you state, it becomes damp shortly after wiping in a warm room, it is quite unfit for photographic purposes. To say that we have *never* lost a negative by fading would be untrue, but when we have done so it has always arisen from *pure carelessness.* Exposure to damp, even when properly varnished, will affect them sooner or later.

Positives on glass are liable to deterioration in brilliancy, if not varnished, from noxious vapours; and if varnished, the varnish itself often degrades the tone.

We are almost tempted to fancy that your trouble may be due to the pyroxiline of which your collodion is made being insufficiently washed before use, or else improperly made. Have you tried varieties of collodion? —Ed.]

CHEAP CAMERAS FOR DEROGY'S LENSES.

To the Editor.

Sir,—As you have been kind enough to give photographers a clear account of what they may expect from the performance of Derogy's lenses, I am induced to ask if you could confer the additional favour of telling us how or where we can get cheap or serviceable cameras with sufficient focal range for the various combinations of these lenses. In addition to the usual collodion frames, they should (I think) have double paper slides for the larger-sized pictures.

M. Derogy's price list says nothing on the subject, and the ordinary cameras of the shops are of no use in this case, while a suitable camera, capable of taking large and small pictures, made to order, would probably be so costly as in great measure to deprive amateurs of the benefit to be derived from a good cheap lens for large pictures.

I am, Sir, yours, &c. ?

[The cheapest cameras with which we are acquainted are the French walnut-wood ones, costing about 35s. to 40s. for what they call a whole plate size: these answer very well for portraits, but having a tail-board, and being heavy, they are not so well adapted for landscape purposes.

We no not think it politic to endeavour to make the same camera answer for portraits and landscapes, as in using it for either purpose you must always bear some inconveniences, in consequence of its adaptation for the other. In having two or more cameras it is a good plan to make the plate frames fit them all, and also to have sliding fronts removable and fitting each of the cameras.

We shall be glad of suggestions to solve the problem propounded by our correspondent. Our own notion lies in favour of cameras made of yellow pine, well oiled with boiled linseed oil and varnished. We want however some cheaper and more easily made plate frame than now exists to work with the above. Some short time back Mr. Hughes suggested vulcanite for this purpose, and we consider the idea a very happy one, as if made in quantities they could probably in this material be produced at a moderate price. We shall possibly give a further hint or two in our next.—Ed.]

PRACTICAL DETAILS.

To the Editor.

Sir,—I constantly notice in your interesting Journal answers and questions which I dare say to you are in a great measure foolish, therefore I am emboldened to propose some of the same description. I should still hesitate but that I know you are always willing to help those who are in difficulties. I shall be extremely obliged by your answering any or all of my propositions, and shall, with your numerous engagements, consider myself not hardly dealt with if you take no notice of this communication.

1. Is it necessary for developing solutions to use pure alcohol, or will good naphtha or methylated spirits do?

2. Would you be kind enough to give me a good formula for negative developing mixture?

3. Is it best to develop with iron and then strengthen with pyrogallic acid, before or after fixing with cyanide; or is it advisable to complete the whole with pyrogallic acid at one operation?

4. For a portrait background in the open air, what colour is the best?

5. For landscape stereoscopic work is it desirable to have one or two lenses?

6. Will twin portrait lenses answer equally well for view work, when one glass from each lens is removed and a diaphragm inserted?

Your kind attention will oblige.—Yours, &c.

Liverpool, September 26th, 1859. VERY GREEN.

[1. It would not do to use wood naphtha, and methylated spirits are decidedly objectionable in a proportionate degree. It is bad economy to use any but the pure alcohol, though it is not necessary to be of very great strength.

2. *a.* Pyrogallic acid one grain, distilled water six-and-a-half drachms, Beaufoy's acetic acid one-and-a-half drachms; or, *b.* pyrogallic acid one grain, distilled water seven-and-a-half drachms, glacial acetic acid half a drachm; or, *c.* pyrogallic acid one-and-a-half grains, distilled water seven drachms, citric acid one grain, alcohol one drachm.

3. In *cold weather* develop with iron, clear with cyanide, and strengthen with pyrogallic solution. In hot weather the iron is not necessary—in moderate weather do as you like.

4. For a light ground, a blanket; for a dark one, a piece of red baize; or grey for medium.

5. Two decidedly.

6. No.—Ed.]

THE ARCHITECTURAL LENS.—INSERTION OF PHOTOGRAPHS IN TOMBSTONES.

To the Editor.

Sir,—In reply to "T. S.," who writes privately, wishing to know if the defining quality of Sutton's triplet is as good—size of stop considered—as that of the Petzval combination, and if it answers as well for general landscapes as this latter, I would remark, that while the Sutton lens which we (the testing committee) submitted to trial gave absolute straightness of lines, it required a very much smaller stop than any of the others to get definition. This may have arisen from some slight imperfection in the individual lens tried, which I think was one of the earliest made; and without seeing some more "triplets," I would not venture to assert that, in definition, this is not equal to the Petzval form. Further experience in their manufacture may eventually lead to the attainment of good definition with as large a stop as that required by others; but in the meantime the very small stop required will be a bar to its popularity, except for architectural purposes. The want of definition in the triplet which we tried may perhaps be accounted for in the fact of the front lens having been a non-achromatic meniscus of crown, the correction of which would be effected by the biconcave centre lens of flint. Mr. Sutton, I think, recommends the front lens to be achromatic as well as the back one, and the small central concave to be of rock crystal.

With respect to the "New Use for Photography," at page 226 in your last number, I am really sorry to have to displace the laurels from the brow of Mr. Murray, but in justice to Edinburgh it must be stated that photography has been applied here for some time past in the way he suggests. It is at least a year since Mr. Tunny erected, in Warriston Cemetery, a handsome monument at the grave of his wife, in which is inserted a photograph on porcelain. This has been seen by thousands.—Yours, &c. J. T. TAYLOR.

81, *South Bridge, Edinburgh.*

[We do not think that a lens constructed as described would do justice to the principle upon which it is founded.

Opticians have an objection, based upon experience, to transmitting an *uncorrected* ray for any distance; were it not for this circumstance the two meniscus lenses might just as well be made of simple crown glass, and be *both* corrected by a simple biconcave of flint glass between them.

The term "triplet" is not usually applied to such combinations as the above named; but generally indicates a compound lens of three pieces with the continguous surfaces in contact.—Ed.]

THE POSITION OF THE DIAPHRAGM.

To the Editor.

Sir,—May I beg the favour of a reply to the following query in the forthcoming number of The Photographic Journal?

Which is the proper position for a diaphragm or stop in a double combination lens when used for landscapes or groups—midway between the anterior and posterior combinations, or immediately before the anterior?

Opinions are so divided on the subject, I greatly wish to have the weight of your authority to settle the question.—I am, yours, &c.

GEORGE HAYDON.

Eccles, September 23rd, 1856.

[For landscapes, the diaphragm to a double combination lens should be unquestionably *between* the components—not quite midway, but rather nearer to the front lens, that having usually the shorter focus of the two.

By this arrangement the illumination is rendered more even and the distortion of marginal line obviated.

Why not try for yourself? Glue together two or three thicknesses of brown paper, and cut out diaphragms to suit each place, and take pictures under both circumstances. With the diaphragm between the lenses you will find a *larger field* is covered than with the same in contact with the anterior portion.—Ed.]

ANSWERS TO CORRESPONDENTS.

Samuel. R.—The first on your list.

Pax.—Never too late to mend: try more acetic acid.

Thos. Gulliver.—We shall be happy to receive the communications named.

Purblind.—If you cannot clearly *see* your way, resort to *feeling*, and hand out the subscription solicited to the Archer fund at once.

C. Prettyman.—You will find a full description of our *orthographic camera* in a recent number of the Journal, published 15th June last.

M. S. D.—*Ten* grains of chloride of *ammonium* will produce as much effect as *twenty grains* of chloride of *barium*, consequently your experiment proves nothing relative to the point you aimed at.

Subscriber (Colchester).—In our last, a portion of our reply to you was inadvertently separated from the rest by the printer in "making up" the form, he having mistaken the word *rationale* for the pseudonym of another correspondent.

Geo. K.—We have seen the article for which you ask advertised lately for sale—we believe by J. Solomon, Red Lion Square, London. You may very likely be able to make some that will answer well enough by coating paper with Bates's black varnish.

Amateur. Henry Robertson. B. L. Ignotus.—We let "the other side" speak this time—besides, we have *no room* to do as you request in the present number, even if we had the time. We shall probably do so in our next—but at any rate in an early number.

Received.—"D. L."—"C. J. B."—"Ak.",

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 104, Vol. VI.—OCTOBER 15, 1859.

In our last we were enabled to lay before our readers a tolerably elaborate account of the proceedings and the various papers connected with the art of photography that were read at the recent meeting of the British Association for the Advancement of Science at Aberdeen. The great length to which our report extended, and the near approach to the time of publication before we got the whole before us precluded the possibility of our making many comments on the subjects brought under notice. We therefore propose to touch upon some of them on the present occasion.

First in importance *to photographers* appears to be the "Report" by Professor Maskelyne, and Messrs. Llewellyn, Hardwich, and Hadow, *On the Constitution of the Photographic Image;* and we think it but fair to remark that we were only enabled to obtain, in time for our last, a reporter's *abstract* of the paper, consequently that many of the most important data upon which the conclusions arrived at were formed are not as yet before us. It would perhaps be impossible to select men better qualified to undertake the requisite investigations than the gentlemen who are responsible for the report; we are, therefore willing at once to conclude that they have very strong grounds for the opinions they have expressed, although they differ *in toto* from those of the eminent French savans who have employed themselves with a similar inquiry. We have before now expressed our dissent from some of the views put forth by the latter, but we are certainly somewhat surprised at those of our own countrymen—not because we have any reason to question their soundness, but inasmuch as they are somewhat unexpected. We shall look forward with considerable interest to an opportunity of studying the paper *in extenso.*

One point of marked disagreement with the conclusions of our continental brethren will be found in the view taken relative to the first action of light reducing the argentiferous compound to a state of sub-oxide—an idea which our foreign friends strenuously oppose.

We cannot help fancying that there must be some mistake in the report of the observations of the President of the Chemical Section after the reading of the paper just noticed. He is quoted as having remarked as follows, viz.:—

> "If you take any calotype and dip it into a solution of bichloride of mercury it becomes perfectly white, *and no vestige of the image remains;* but afterwards, if it be placed in hyposulphite of soda, it becomes completely restored. The mode in which the chloride of mercury acts in rendering the image latent has, as yet, as far as I am aware, received no satisfactory development" (explanation?).

We certainly were not aware that any *mystery* connected with this simple matter existed. The explanation appears to us clear enough. In the first place, the image after the action of the perchloride of mercury is *not latent,* and only invisible when the paper upon which it rests is perfectly white and colourless; and in the second, it is not only by the action of hydrosulphate of soda that the image may again be made apparent; hydrosulphate of ammonia, hyposulphite of soda, liquid ammonia, &c., or any analagous agents, can be employed to reinstate the image.

The explanation is this:—the bichloride of mercury is decomposed, one atom of chlorine uniting with the silver of the image, causes a deposit of proto-chloride of mercury (calomel) in the form of a white powder, to be formed, with an intensity exactly proportionate to the amount of silver previously there. The image is therefore accurately depicted in *white,* and, if the supporting layer were black, would appear as a negative. On the addition of a compound containing sulphur, the mercury becomes released from the chlorine, and uniting with the sulphur forms a dark brown sulphide of mercury, and consequently upon a white ground the image again becomes visible. In a similar manner the action of ammonia gives rise to the production of protoxide of mercury of a black colour, and of course in this case also the image is restored to the eye. There may be something more mysterious than we have stated above, and if so, we shall be obliged to any one who will kindly indicate in what it consists.

Some specimens exhibited by Dr. Gladstone, illustrative of the actinic inactivity of light reflected from fluorescent substances, are highly interesting, as in part explaining why *colours alone* are not to be taken as a criterion of the probable amount of actinic influence of which the light reflected therefrom may be possessed. This is a subject of peculiar interest to us, and one to which we drew attention formally about fifteen months ago, as may be verified on reference to our last volume, pages 174 and 175, in a paper entitled "Suggestions relative to testing qualities of glass intended for Photographic Operating Rooms," and casually on several previons occasions. If we remember correctly, also, an illustration of a similar matter was exhibited not long since at a meeting of the Blackheath Photographic Society, where slabs of porcelain, tinted of various hues by metallic oxides, &c., and similar hues by different agents exhibited, on being photographed, the fact that colour alone could not be relied on for predicting the result.

The experiments of Dr. Gladstone are striking, and certainly suggest the probability of a satisfactory explanation of the phenomena. It must not, however, yet be recognised as *un fait accompli,* until those coloured surfaces which are inactive in reflecting the chemical rays have been extensively examined, and pretty generally found to possess more or less the quality of fluorescence.

There is one fact that occurs to us at the moment of writing which appears to militate against the phenomenon of fluorescence being of itself sufficient in all cases to account for the want of actinic energy, and this is, that in copying a painting in many colours the effect produced in the photograph differs materially according to the inclination of incidence of the illuminating rays—a fact which would seem to point to *polarisation of the light,* as also influencing the result; and, furthermore, the character of the light employed also affects it.

We really cannot help feeling sorry at having to throw even the shadow of a doubt upon the satisfactory nature of the fluorescent theoretical explanation, it seems so perfect; and, as Dr. Wilson observed, "If we acknowledge the fundamental principle of the co-relation of forces, then we cannot expect to change an invisible chemical ray into a ray of light, and retain the same chemical power." The force of this observation applies, in all its integrity, to the photographic phenomena influenced by fluorescence, even if it should eventually appear that fluorescence

alone is not sufficient to account for all cases in which the variation of effect from colours alike to the eye occur. Here is a wide field of usefulness open to any zealous photographer in search of a direction in which to expend his energy.

Perhaps the most generally interesting paper of all that were read at the late British Association Meeting upon photographic matters, in a popular point of view, was that of Mr. Warren De la Rue *On Celestial Photography.* We say popular, not because it was any the less scientific than the others — as we regret to say is the case with most attempts to render science popular — but because it is one in which everybody can feel an interest, whether photographers or not. Some of the most striking facts to which our attention has been directed in this paper are:— the much greater difficulty experienced by the delineator of celestial objects than falls to the lot of one who operates only upon those terrestrial; the ingenious arrangement proposed to vary the rate of motion of the clock movement to the telescope at will, viz. — the introduction of the disc and plate motion; and a fact that we regard as of considerable importance to photographers, the much smaller loss of actinic power by reflection than we should be led to anticipate from a knowledge of the amount of deterioration of the visible rays. This should not be lost sight of, as it may be useful to remember when contriving certain pieces of apparatus hereafter. That the full moon should be capable of impressing its image photographically more rapidly than when in part illuminated, might of course be anticipated by any one who considers the subject, because in the latter case the solar rays fall upon the satellite obliquely to the spectator, instead of perpendicularly, as in the former; but how few of us are likely to have thought about it until we had tried the experiment and wanted an explanation for the phenomenon observed!

Lastly the description of the photo-heliograph employed at the Kew Observatory for recording, by means of photography, the appearance of the sun's disc and the progress of the spots across it, will no doubt have been of interest to every reader.

We are desirous of correcting a slight error into which we had fallen relative to the late Mr. Andrew Ross, whom we stated in our obituary to have received the Gold Isis Medal and the sum of fifty guineas from the Society of Arts, for the *microscope* made by him for Mr. Valentine, and from that gentleman's design. We find that it was for the *Dividing Engine* that Mr. Ross received the above-named prize, and that Mr. Valentine himself received the silver medal for the design of the microscope. While on this subject, we may also mention that the late Mr. Ross was educated at the Bluecoat School, and that before setting up in business on his own account as an optician, he worked for two years in the shop of an engineer; and he used to affirm that he acquired more information there relative to practical mechanics than he could ever have obtained amongst the opticians.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

It is with no small amount of pleasure that we have felt called upon to notice from time to time, under the above heading, some very meritorious productions of photographic skill. Every week now furnishes fresh evidence of the important aid afforded by it towards the development of art, and we will cite one or two instances that have recently come under observation.

In the Suffolk Street Gallery there was exhibited a painting called *The Mother's Hope.* It was not difficult to see that the artist had been "ploughing with another man's heifer." It may perhaps be borne in mind that a series of groups, illustrative of *The Seven Ages*, by Mr. Rejlander, was exhibited in the last collection of the Photographic Society (in the same locality by the way), one of the groups being, "*The infant mewling and puking in the nurse's arms,*" a group which, if we remember rightly, was laid under heavy condemnation by a bashful critic, upon the ground of its having offended the sense of propriety of a prudish old maid at the *soirée* held in the exhibition room. Now "The Mother's Hope" is drawn precisely after the model of this group; the general arrangement, the baby in the lap, &c., all being exactly the same, the chief variation consisting in the infant smiling instead of playing the part that Shakspeare had set down for him.

Would any of our readers like to have ocular demonstration, let them procure a copy of the *Illustrated London News* for the 27th August last, and they will find therein a woodcut taken from the painting.

We are not asserting that the application of the idea is not legitimate, any more than if the artist had seen the group in nature and reproduced it; but we do assert emphatically that it is a convincing proof of the valuable aid that artists may derive from photography, and we must put in a claim for a small share of the credit being justly due to Mr. Rejlander.

While on this subject we may remark, *en passant*, that the attempted reproduction by woodcuts are not always so happy as in the present instance; witness the awful caricature of Mr. Robinson's *Fading Away* which was perpetrated some time back without the consent or knowledge of the artist.

We have also heard of another painting having been sold early in the present year, which was *copied altogether* from one of Mr. Rejlander's photographs, being *a Gamekeeper and a Peasant*, with basket and other accessories.

These facts speak for themselves, and Mr. Rejlander, like a sensible man as he is, instead of grumbling at being made useful to others without his permission being first obtained, has turned his attention to the means of affording a supply of his compositions at a very cheap rate, while still maintaining their original excellence. In order to accomplish this object he has been making experiments in copying his original compositions by means of his Petzval lens, and with such success that few, if any, would find out that they were copies at all, as they possess all the roundness and brilliancy of the originals.

There are many, very many, who would be delighted to possess a good specimen of the first proof from many negatives exhibited by this artist — the *Two Ways of Life* — but who are unable to afford the luxury of a large proof, while the smaller copies as heretofore produced, though possessing all the same grouping and outline, were far below the larger ones in brilliancy. Now, however, they may freely indulge their desire, for Mr. Rejlander has succeeded in producing from his *best original* a minature negative retaining all the beauty and exhibiting none of the grain of the paper. The result is truly beautiful, and we strongly advise all lovers of our art to send for a copy, which will cost but a trifle, and well satisfy them.

The Wayfarer and *God Speed Him* have been treated in like manner, and should the public appreciate the efforts thus made to meet their wants, no doubt other compositions will be forthcoming also.

PHOTOGRAPHERS THEIR OWN ARTIFICERS.
No. 1. PORTABLE TENT.

By Thomas Gulliver.

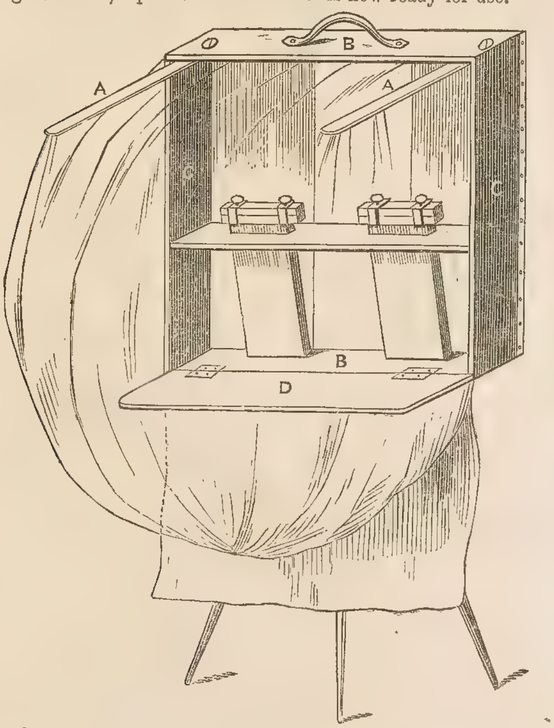
Enclosed I send a sketch of a portable tent that has proved to me a real treasure in working the wet collodion process in the open air. I formerly worked with a tent fitting over the camera stand, and have tried a host of developing boxes, and lost much money, time, and temper, in constructing and trying to work these uncertain contrivances. Photographic barrows and carriages may be well enough in some places, but not very well suited to take into a railway carriage, or over steep hills and through valleys, where sometimes the wandering photographer is bound to go. My tent is not more cumbersome or unsightly than a carpet-bag, and the weight a mere trifle. Any one can make it with little trouble or cost. The following is all that is wanted for it:—

A	2 pieces of ash,		$18\frac{1}{2} \times 1 \times \frac{3}{4}$ inches.	
B	2 pieces of yellow pine wood,		21×5 inches.	
C	2 ditto	ditto	$19\frac{1}{2} \times 5$	"
	2 ditto	ditto	21×5	"
D	1 piece ditto	ditto	$19\frac{1}{2} \times 6$	"

3 screws and nuts, a few strips of red leather, and some brass tacks.

6 yards black casban or silesia,* and 4 or 5 of yellow calico.

A square frame is to be made first, 20 × 19 × 5 inches. A shelf is then fixed across, to support the nitrate bath and the washing bath. An upright is then to be affixed, not quite in centre, to keep the frame firm. A shelf is now united to the frame with hinges, so as to fall down, and with the bottom of the box form a small table to develop on. The frame is now complete, and must be covered in front with the black casban (double), having a strip of yellow calico, four plys thick, sewn down the centre for a window. The rest of the black and yellow material is now formed into a sort of bag, which is tied round the operator's waist; and the apron in front being tucked in, a perfect dark chamber is now ready for use.



In fastening the black casban round the frame-work, it will be best to strain it over the edge of the wood-work, and then tack it neatly to, using the strips of red leather and brass tacks. The wood-work must be brushed over twice with a varnish, composed of

Shellac	2 ounces.
Wood naphtha	6 "

Mix and dissolve.

This will give it a nice appearance, and with the red leather binding and brass nails, it will be such a parcel as few will object to carry. The fittings required inside are a gutta percha bath for silver solution, with tight top, a wooden washing bath, also with tight top, two 2oz. bottles for collodion, two 4oz. bottles for developer, a developing tray, two plate boxes, and small sponge. The manipulation will slightly differ from the usual mode in order to suit the internal arrangements of the tent that I propose to explain in your next number, and to give directions for making deal cameras, camera stands, plate boxes, dark slide, developing trays, water-tight top washing bath, dippers, &c. All the above have stood the trial of the heat of last summer, and are now as good as ever if varnished over with the shellac varnish. The changes of weather do not affect them, and the saving of weight and cost is considerable. With the tent I started yesterday to photograph Oystemouth Church, "about to be rebuilt;" arrived there by two o'clock, and left by half-past four o'clock, with five negatives, three whole plates, two stereos, out of six glasses taken. Prints from one or two I will send next week, also a photograph of the tent. The deal camera I am now using weighs no more than two double dark slides of old make.

* Used for backs of waistcoats.

THE SOLAR CAMERA.

In order that our antagonists upon the question raised relative to the alleged novelty of the above-named instrument might have the utmost advantage for stating their own case, we abstained in our last issue from entering as fully into it as we had intended on our side of the argument; but as we find from correspondence that there are some of our readers who desire further information, we now purpose continuing the discussion. On reference to our article in No. 102, p. 223, we perceive that we inadvertently omitted to state the fact that, although we inspected Mr. Wenham's specimens privately at first, *they were publicly exhibited to the members present at the Meeting of the Photographic Society held on the 1st December*, 1853, when his paper was read; and, as the meeting was well attended, there are plenty of individuals enabled to give evidence of the fact, if there be those who are inclined to question the accuracy of our memory.

In order to let our readers know what is thought about the matter in America, we extract *verbatim* the following from the 1st September No. of a respectable periodical, *The American Journal of Photography,* reputed to be the organ of the National Photographical Society. It will be perceived that the editor does not regard us personally with favour, consequently we presume that his testimony will not be deemed partial:—

"EDITORIAL MISCELLANY.

——— "The subject of the latest nine days wonder among our foreign cotemporaries is the 'American Solar Camera.' At last our friends confess that they owe something to American genius; they have fed their eyes with the vision of a solar camera—a genuine article, all the way from America—they have imposed their hands on the machine. Eureka, cries each one, and ruthlessly assaults the dictionary for adjectives to express his laudations. Mr. Sutton expects a photographic millenium; M. l'Abbé Moigno, who in the beginning of a long article in *Cosmos* of July 22nd, boasts:—'We are certainly the first to call attention' to the solar camera, declares that the great invention has been made 'providentially' for the glory and advancement of photography.

"And in the loud chorus of praise the only notes of discord come from the Liverpool Journal. Mr. Shadbolt promising to examine the apparatus says, 'We are not sanguine about finding any novelty much less ground for a patent.' But it must be remembered that Mr. Shadbolt is notoriously severe on American affairs, delighting to print even vulgar blackguard if directed against American photography.

"Mr. Woodward, of Baltimore (our neighbours call him 'professor'), is making a photographic tour in Europe with his camera and specimens. We are not personally acquainted with Mr. Woodward; we never considered the solar camera a great or useful invention, but we are persuaded that Mr. Woodward has elements of greatness; else how could he throw dust so accurately that our English friends were blinded to the fact that *six years ago they used the same apparatus,* and that our French friends were oblivious of the fact that Chevallier has for years manufactured and figured in his catalogue and other publications the *camera solaire,* and claiming to have first constructed it in 1839; and the probable fact that the first life-size photographic portraits were made in Paris by the American Thompson. Also Mr. Woodward made our foreign editorial brethren forget that a year ago, and more, they had read in the American Journal of Photography, the mathematical principles to be observed in enlarging photographs, and a demonstration of the imperfections of Woodward's contrivance, and a description from New York papers of a photographic portrait on a scale of Twenty-Five feet correctly enlarged, and by a better intrument than the solar camera. Perhaps, indeed, at that time our foreign brethren looked with such contempt on American photographic literature, that they did not humble themselves to read what was written on the subject. Mr. Woodward deserves well of his country; he has elevated the American Eagle; we will welcome him back with outstretched arms; we will compliment him with a banquet and medal.

"But in veriest seriousness, does not the grand triumph of solar camera in Europe seem like an unsubstantial vision to our readers who understand the enlarging process.

"We venture for ourself an explanation of the whole phenomenon, which an examination of almost any foreign journal will illustrate. These journals advertise as a habit and custom, not only in their advertising columns, but editorially, what we should here call quackery. They publish constantly letters from photographic dealers and pseudo inventors puffing what they have for sale. Such practices and such habits are certainly not conducive to fair scientific criticism; what better illustration of the effect of them can we have, than the recent glorifications of Pouncy and Niepce de St. Victor? While our neighbours sneer at what they imagine the peculiar American character, let them look at home for examples of the *Yankee.* At any rate there are so many subjects abroad for a *cute* practitioner, that if we felt inclined to encourage such genius as that of the Rev. Hill, and of the inventors of collodion gilding, we should prescribe emigration.

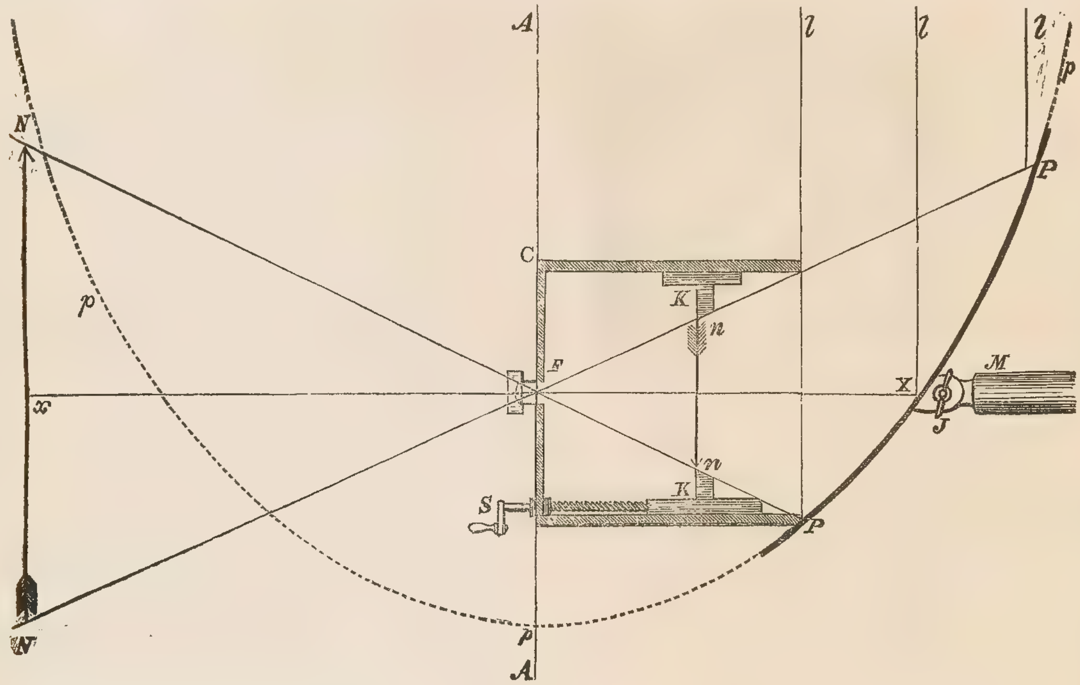
"We observe that Mr. Woodward talks about the ammonio-nitrate process in connection with solar camera. We are not aware that any of our American

sunlight has been exported to penetrate the fogs of London. Perhaps some of the purchasers of the solar camera may be induced to send for the New York *Sun*; it costs only one cent. per day, it might prove useful in an unenlightened quarter."

As our immediate object is to discuss the matter of producing enlarged proofs from small negatives, we shall not attempt *at present* to correct the false impressions of our American contemporary relative to the sentiments that he imagines us to entertain towards him; perhaps we may do so at some future time, unless indeed, what is not at all improbable, he may find out his mistake when he knows us better. We proceed therefore to explain more fully the views advanced in our former article.

Of course it is obvious that in order to obtain the maximum of effect with a minimum duration of exposure, the direct solar rays must be employed, but in bright weather, when time of exposure is not so important, we are of opinion that we might consequently employ the diffused light of day; but in order to do so we must of course avail ourselves of converging rays, and to this end we conceive that it is preferable to effect convergence by means of a concave mirror than by a lens, thus avoiding dispersion. But this is not all, for as the sun is constantly shifting its relative position, when we desire to employ its direct rays a reflector of some kind is absolutely necessary in order to avoid the inconvenience of having perpetually to shift the whole apparatus. The amount of light lost by reflection from any given area of surface, whether curved or plain, would be the same in both cases, consequently by the use of a concave reflector we obtain convergence of the rays with a direct saving of the amount of light that would otherwise be lost by reflection at both surfaces of the lens, and also by absorption in consequence of the great thickness of glass.

We have before stated that the best form of curvature to adopt would be that of a portion of paraboloid of revolution, as it is the property of such a surface to reflect parallel rays falling in the direction of the axis of revolution to a point; but inasmuch as the lens employed for effecting the enlargement of the image will only transmit a pencil of light of limited angular aperture, it is of no use to apply to our apparatus a much larger surface of the paraboloid than may be included in the segment defined by such angle having its apex in the focus of the paraboloid. This will be better understood on reference to the following diagram:—



Let the plain and dotted line $p\ P\ P\ p\ p$ represent a parabola having its axis at $A\ A$ and focus at F. All rays falling parallel to A, the axis of revolution of the paraboloid will meet accurately at the point F.

Let C represent the segment of our enlarging camera having the lens (an orthographic one by preference) situated at F, and being quite open at the back. The length of the camera should be rather more than double the solar focal length of the lens F. At $K\ K$ is a sliding plate frame, having an opening in the middle, and capable of receiving square inner frames to hold the negative $n\ n$. This piece $K\ K$ should be adjustable towards and from the lens, and may be moved by means of a screw and crank handle S.

Now if $P\ F\ P$ be the angular aperture of the lens, the portion of the paraboloid cut by the revolution of this angle about its axis $X\ x$ would be all that is requisite for our purpose, we may therefore take a little latitude in all directions, and content ourselves with the portion indicated by the thick line $P\ P$, which will consequently *represent our mirror*, and it is manifest that the greater the distance between the points F and X the larger the surface would be from which light would be reflected, and therefore the action would be more rapid, as all the rays between those marked $l\ l\ l$ in the diagram would be brought into effective service, and these would increase in number with the area of the mirror.

If solely intended for use with diffused light, the mirror might possibly be advantageously made with a spherical surface, as by a proper adjustment the light could be collected from a larger area of the heavens, though not so accurately brought to a focus as parallel rays from a parabolic surface, and though this would probably be to some extent objectionable with direct solar rays, we do not think it would materially deteriorate the result when diffused light alone should be made use of, and in this case we are of opinion that ordinary salted albumenised paper might be exposed until a faint visible impression were obtained and then further developed by gallic acid.

For printing by the direct sunlight the camera should be placed with its axis $x\ X$ pointing towards the pole star, and the mirror mounted on a centre M, around which it should be made to revolve, the sun's rays might then be collected and thrown on the point F (thus passing through the negative $n\ n$) from sunrise to sunset, without requiring any alteration in the position of the camera. In order to meet the case of the variation of obliquity in the sun's inclination between summer and winter, a cradle joint at J would admit of the necessary adjustment, which would only require to be altered, and that very slightly, about once a week. It is true that this would in a trifling degree interfere with the rigid accuracy of the convergence of the rays to an exact focus, but not enough to make any practical difference.

Of course we need hardly mention that the paper to be impressed would be located at $N\ N$, or any greater or less proportionate distance from the lens according to the desired degree of enlargement.

As regards the mirror, we do not see any reason why even a spherical surface should not afford results equal in every respect to those obtainable with a plane mirror and condensing lens, with even greater rapidity, for reasons previously given. Concave mirrors of this description are neither expensive nor difficult to be procured: there might, however, be some trouble in obtaining them of the paraboloid form if it were requisite to have this *very* accurate; but we apprehend that sufficient correctness for this purpose would be arrived at by a skilful glass-blower with very little labour, and the silvering could be performed readily enough by the use of solution of nitrate of silver and oil of cloves or honey — a mode of working in common use.

In conclusion, we may remark that in selecting the Petzval lens in preference to any other kind, we do so because we believe it to be the best for rendering a correct representation of a plane surface upon one of a like kind.

M. DE LA BLANCHERE ON COLLODION.

In order to prepare a photographic collodion that will meet all the conditions required under various circumstances, it is first necessary to prepare various sensitising solutions. These solutions are composed of alcohol, holding in solution alkaline or metallic salts, which by double decomposition yield sensitive salts of silver, which, included in the layer of collodion, receive the impression of the rays of light. As the sensitive salts of silver are formed in the bath of nitrate of silver, we shall now premise that the base or metal we put into the photographic collodion will be left in that bath, increasing in quantity with the number of plates immersed in it, and removing an increasing quantity of silver. We can at once perceive how variable the composition of the silver bath must be, and how necessary it is to keep it always in good condition. Further experience will doubtless prove that most failures arise from defects in the silver bath.

All the sensitising solutions of which we give the formulæ improve by keeping, they should therefore be mixed before they are wanted for use; we are satisfied that the longer they are kept the more they increase the sensitiveness of the collodion to which they are added.

It is a very remarkable fact that the proportions of the iodides and bromides, and of the sensitising salts generally, greatly influence the quality of the negative. We require two opposite qualities in a portrait, detail and relief, and it is by sacrificing a portion of the first that we obtain the second. Now we can obtain the desired effect by a suitable sensitising of the collodion, as well as by an appropriate lighting of the object and careful focussing.

The salts of cadmium appear to be preferable to all others for sensitising, because comparative experiments have proved to me that, while it gives a rapidity more than sufficient and quite equal to that of other similar salts, it is more stable than any other. This stability in connection with the variable and uncertain elements of pyroxiline dissolved in alcholic ether is of the highest value, as it prevents the loss of old collodion, and also admits of the sensitised collodion being allowed to repose a sufficient time without fear of its altering in quality. For it is certain that this collodion is much more sensitive two or three days after it is sensitised than on the first day, which is not the case when an iodide of potassium or ammonium is employed, as they begin to decompose immediately they are mixed.

I also prefer the salts of cadmium, because their composition renders their integrity more certain; for iodide of potassium and ammonium vary to a considerable extent, in proportion as their porosity retains more or less of the interposed material. The pearly scales of iodide of cadmium are dry, uniform, and retain no foreign matter.

SENSITISING SOLUTION, NO. I.

Quick: great detail: deep shadows: yielding a perfect negative.

Iodide of cadmium	7.50 drachms.
Bromide of cadmium	1.25 „
Chloride of cadmium	0.25 „
Alcohol, sp. gr. 0.827	100 fluid drachms.

In this solution the proportion of sensitising salts is 9 per cent.

SENSITISNG SOLUTION, NO. II.

Very quick: much detail: good shadows: negatives less harmonious.

Iodide of cadmium	6.00 drachms.
Bromide of cadmium	1.00 „
Chloride of cadmium	0.25 „
Alcohol, sp. gr. 0.827	100 fluid drachms.

In this solution the proportion of sensitising salts is 7.25 per cent.

SENSITISING SOLUTION, NO. III.

Less detail: general effect, mellower but softer: not quite so quick: proofs more harmonious and artistic.

Iodide of cadmium	5.50 drachms.
Bromide of cadmium	2.50 „
Chloride of cadmium	1.00 „
Alcohol, sp. gr. 0.827	100 fluid drachms.

In this solution the proportion of sensitising salts is 9 per cent.

According to the quality of the alcohol employed, there will be more or less difficulty in dissolving the bromide and chloride of cadmium in the formula No. 3. These salts, much less soluble in alcohol than the iodide, often require several days for their solution. The bottle must be shaken frequently, and the salts pulverised in a glass mortar with great care.

All the above solutions are added in the same proportions to the normal collodion.

To prepare photographic collodion put into a graduated glass measure —

Collodion (thick or pharmaceutical)	100 parts.
Sulphuric ether, sp. gr. 0.735	100 „
Sensitising solution	20 to 25 „

This last dosage gives for each of the formulæ: —

No. 1. Sensitising salts	1.12 or 0.99 per 100.	
2. „	0.94 „ 0.83 „	
3. „	1.12 „ 0.99 „	

But the first will almost always suffice: we begin therefore by employing it, ready to add more, if it be not sufficient. Some sensitising salts, of different manufacture, appear to have more power than others to iodise a collodion.

The proportion of ether indicated above may be considered as a mean adapted for ordinary temperatures, 55° F. to 70° F. Above this temperature the quantity may be increased, and diminished if below it; but the quantity must not vary more than within one-third of the ether added, or 20 parts. It is, however, much better not to vary the original quantity, but to accelerate or retard the pouring on the collodion to the glass plate. If, however, the plate be very large, there is no alternative but to modify the collodion according to temperature.

Beginners should especially avoid changing their formulæ, for the less they vary the sooner they will succeed. The misfortune is that few are satisfied to let well alone, but hanker after something better, which can only be arrived at by great expenditure of time, labour, and patience, and if they fail in success, they rail at the difficulties of photography. Adopt a well-tried formula, and if you obtain good results, be satisfied with it; if you do not, attribute it to your want of care and perseverance, and try till you do succeed. — *La Lumière.*

ON THE PREPARATION OF GUN-COTTON.

By M. Van Monckhoven.

If ordinary pyroxyline be placed in a glass tube or retort, and submitted to the prolonged action of ammoniacal gas, a portion of the nitric acid passes to the state of nitrate of ammonia, the pyroxyline acquires a yellowish hue, and exhibits the following composition—

Carbon	28·07
Hydrogen	3·32
Nitrogen	10·92
Oxygen	57·69
	100·00

This compound, to which M. Bechamp has given the name of *tetranitric cellulose*, is not soluble either in alcohol or in ether, but if a little ether be added to the alcohol, or a little alcohol to the ether, it dissolves rapidly. Water precipitates it in bulky flakes, which do not unite together in drying.

This variety of gun-cotton is, in a photographic point of view, very important.

A collodion has been recently introduced in which alcohol is in much greater proportion than the ether. Our experiments do not confirm the claims set up for this article by the promoters, but that says nothing. However, if our suggestion is worth any thing, we recommend those who are engaged in its manufacture to make use of a pyroxyline which has remained for an hour in ordinary strong ammonia. The alkali must not be employed in excess, it is only necessary to impregnate the cotton with it.

At the expiration of the time previously indicated, the gun-cotton must be washed in abundance of water and dried. It is then soluble in a mixture of one part ether and nine parts alcohol.

Trinitric cellulose is obtained, according to M. Bechamp, by the action of caustic potassa upon the ethero-alcoholic solution of pyroxyline. Like the other, it is insoluble in ether, but the addition of a little alcohol determines the solution. Concentrated alcohol dissolves it at ordinary temperatures. Water precipitates this solution with difficulty, and the precipitate, which is very tenacious, unites together in drying.

The solubility of gun-cotton increases with the elevation of the temperature of the acids, but it must not exceed 212°. To obtain a good pyroxyline, it is indispensably necessary to immerse the cotton in the liquid immediately the saltpetre has acquired a clear syrupy consistence with the sulphuric acid; the disengagement of heat being much more rapid in proportion to the intensity of the reaction, it is necessary to reduce the saltpetre to a very fine powder.

New Methods for the Preparation of Photographic Pyroxyline.

Theory and experiment both show, that to obtain good gun-cotton, not only soluble in alcoholised ether, but which will also give a good adherent coating on glass, there must be no excess of sulphuric acid, nor must the temperature be either too high or too low. Upon these principles the following method is based, in which we employ a mixture of nitric and sulphuric acids, but modified as shown:—

Nitric Acid—The nitric acid of commerce is a colourless liquid, of a peculiar odour, and which stains the skin yellow. Commercial nitric acid is generally pure; the impurities it may happen to contain do not usually influence the successful result of our process, which is important. It generally, however, contains foreign substances which may be seen floating in it. When left to repose, these floating matters subside, and the clear portion is decanted into a retort, and boiled until the temperature reaches 253° Fahr., using the necessary precautions familiar to chemists.

A thermometer, graduated in the tube, must be immersed in it from time to time, and when it shows that the temperature of 253° is attained, the action of the heat must be stopped, the retort removed, and allowed to cool gradually.

When at the commencement of this operation, the retort has been completely filled, more than half the liquid must be evaporated before it will attain the temperature of 253°. By adapting a receiver to the retort, the acid passing over in the state of vapour is condensed.

The object of this operation is to concentrate the nitric acid. The usual density of nitric acid is seldom more than 1·42; it then contains four equivalents of water.

Sulphuric Acid—The ordinary sulphuric acid of commerce is usually strong and pure enough for our present purpose.

Cotton—Carded cotton is the best. It is only necessary to pick out any mechanical impurities it may contain.

Gun-cotton is prepared with the above-named acids in the following manner:—Measure twelve drachms of nitric acid, specific gravity 1·45, and pour it into a suitable glass vessel: then measure twenty-four drachms of sulphuric acid, and add it to the nitric acid. As the temperature of the mixture rises suddenly, it is advisable to place the glass vessel in a porcelain dish, so that in the event of the glass breaking the acids may not be spilled.

A thermometer plunged into the acids at the time they are mixed, will show a temperature of 160° to 175°. Stir the mixture with a stout glass rod, and allow it to cool until it reaches 140°. Then put into it, five or six grains at a time, about fifty grains of cotton. Every time a portion of cotton is put into the acids it must be pressed against the sides of the vessel, in order to expel the air, and that the cotton may be thoroughly acted upon. When all the cotton is immersed, withdraw the rod and the thermometer, cover the vessel with a plate of glass, and allow it to stand ten minutes.

At the expiration of this time, transfer the acid into another vessel, squeezing out the excess of acid from the cotton with the glass rod. The acids will serve again for thirty grains of cotton if three drachms of sulphuric acid are added. The cotton is then washed in water containing one per cent. of aqua ammonia, then in pure water, and afterwards dried.

The operation must be performed quickly without interruption; the liquid should not become colder than 120°. The gun-cotton thus obtained is completely soluble in alcoholised ether, and flows freely on the glass. Its colour is yellowish white, particularly if it has been washed in ammoniacal water.—*Bulletin of the Paris Photographic Society.*

CARBON PRINTING.

By M. Alphonse de Brebisson.

Dissolve six or seven parts of fine gelatine in one hundred parts of a saturated solution of bichromate of potash, in a porcelain dish, heated by a spirit lamp. Float upon this a sheet of strong glazed paper, and suspend it by a corner to drain and dry.

When dry, place it in a printing frame under a negative. An exposure four times less than that required for chloride of silver will suffice, and diffused light answers very well. If the lights are solarised, the carbon will not adhere to these points.

When sufficiently exposed, I take the proof into a dark room, and place it, picture uppermost, upon a glass plate, and fasten it at the corners with gum. Then with a tuft of cotton dipped into carbon I cover the proof with a uniform layer of the pigment: either dry lamp-black, or black-lead, red-lead, or other pigment.

The proof is then removed from the glass-plate, and placed in a dish, and a quantity of boiling water poured into it; and by means of a tuft of cotton or soft brush passed over the whole surface, we remove the excess of carbon, and clear the lights, which is very quickly accomplished. Washing in abundance of water completes the operation.

Some operators apply the black to the paper before exposure to light, but comparative experiments have proved that this practice injures the influence of the light. These proofs are far from possessing the delicacy of those on chloride of silver. The effect of the friction of the cotton imparts a leaden aspect, very cold and disagreeable. A fine intense black carbon is necessary, the particles of which do not blend with each other like those of plumbago, which gives an unevenness and uncertainty to the outline, and deprives the pictures of sharpness. This art is as yet in its infancy, and we have everything to hope from the future.

It is a great thing to be able to obtain permanent proofs rapidly and at little expense.—*La Lumière.*

REMARKS ON THE NITRATES OF IRON.

By A. Scheurer-Kestner.

When the solution of a nitrate of iron is left to itself for a while, it sometimes becomes gelatinised and appears opaque. In diluting the solution thus modified with water, the jelly disappears, and the liquid becomes limpid by transparence and thick by reflexion, having much analogy with ferric acetate modified by heat. We know that the allotropic modification of oxide of iron has been obtained from ferric acetate, by submitting this salt to the prolonged action of heat at 212° (?). With the same object in view, I have submitted to the action of boiling water neutral nitrate of iron and the two soluble basic nitrates. These salts were enclosed in sealed tubes, and plunged into boiling water. At the expiration of some hours the colour of the two basic salts was considerably modified: it had passed from brown red to brick red—the solution, limpid by transparence, appeared thick by reflexion. Upon opening the tubes no odour of nitric acid was perceptible but the basic salts had acquired new properties. A drop of sulphuric or of hydrochloric acid, or of a solution of sulphate of soda or of potash, gave rise to a precipitate; while, before being submitted to the action of heat, these salts were precipitated only by concentrated nitric or hydrochloric acids, and not by sulphate of soda. After ten hours ebullition, a portion of the tribasic nitrate, $Fe^2\,O^3\,NO^5$ separated from the precipitate by means of sulphate of soda, yielding upon analysis the following numbers:—

12.525 grs. of the liquid produced 1.186 grs. ferric oxide, and 2.022 carbonate of lime = 2.2039 grs. NO^5, or in hundredths—

NO^5	17.60
$Fe^2\,O^3$	9.88
Water	72.52

The oxide of iron and the nitric acid are found in the relation of 1 : 1.781, while previously the relation was : : 1 : 0.68. At the end of seventy-two hours' exposure to heat, the liquid separated as before, presented the composition of nitrate of iron and three equivalents of acid. At this point the action of the heat stops: the neutral nitrate is not modified even by exposure to boiling point of water for 144 hours. Therefore, the two basic salts only are susceptible of modification.

The precipitate obtained by sulphate of soda, dried upon glazed porcelain, by means of a current of dry air, formed little black scales, insoluble in concentrated acids, but very soluble in pure water, yielding a solution thick by reflexion and limpid by transparence. This remarkable solution no longer gives, with the ferro-cyanides and the sulpho-cyanides, the characteristic reaction

of the salts of iron, and may be reprecipitated by the acids and by sulphate of soda, in reproducing anew soluble oxide of iron. By calcination this oxide has yielded the following numbers:—

0.583 of the substance produced 0.524 of oxide; or

$Fe^2 O^3$	89.88
HO	10.12

The formula $Fe^2 O^3$ HO requires

$Fe^2 O^3$	89.89
HO	10.11

Oxide precipitated after 144 *hours ebullition.*

0.682 of the substance produced 0.626 of oxide; or

$Fe^2 O^3$	91.70
HO	8.30

Thus heat exercises upon the two basic nitrates an action analogous to that it produces upon ferric acetate, but with this difference, that while the ferric acetate is completely decomposed into ferric oxide and acetic acid, the basic nitrates are decomposed into oxide and neutral nitrate, the latter salt resisting decomposition.

Light exercises the same action as heat upon these bodies, and it is to that agent we must attribute the decompositions sometimes produced in solutions exposed some time to the air. Three bottles, properly corked, and containing the three soluble nitrates, were submitted to the sun's rays for five months (from 21st December, 1858, to 21st May, 1859). The neutral nitrate of iron had preserved its limpidity and its original composition, while the two basic salts were in great part modified. Even after three months exposure the liquids had become precipitable by sulphuric acid and sulphate of soda. The same salts purposely placed in obscurity during the same period of time were perfectly preserved, without undergoing any change in their composition.

It will therefore be seen, that there exists a notable difference between the decomposition these salts undergo from the heat of boiling water, and that excited by their own ebullition: since on the one hand they are decomposed without loss of the elements, while on the other they separate into a salt more basic and free acid which is disengaged.

THE HAZE AND CHARACTER OF THE ATMOSPHERE, IN THEIR PICTORIAL, DIURNAL, AND CLIMATERIC RELATIONS, IN REFERENCE TO HELIOGRAPHY.

By Dr. Lotsky.

It is photography *itself* which may prove that apparent paradox—that scientific, industrial, and art inventions and contrivances have *reached*, or almost have reached, their culminating point, and that their universal spreading (popularisation) is *the* performance next following of that drama we call human history. However this may hold good in a general point of view, the haze and character of the atmosphere at different hours of days and seasons, and in different climates, are subjects lying, methinks, at the confines of man's indomitable and practical power.

It is not the *sky* part of Great Britain which makes her what she is in other respects; at least there is not much very artistically characteristic in the haze and glare of the hours and seasons, as they wheel round about us. As we have to discuss, in the present paper, this subject as far as it relates to three, or even four parts of the globe, we may as well leave the English part of it to those who have had an opportunity of dwelling amongst the knolls and rocks, the heather, the bays, and the mountains of old Albion. Besides, these mysteries and secrets of nature are not to be arrived at but by a close intercourse with her, by those whom some intention or other may keep enthralled, as it were, for years and years amongst what Humboldt repeatedly called "God's *free* nature."

Beginning, therefore, with the sub-alpines and meadows of Germany, extending over so vast an area, there are scenes and moments of great ideality to be met with there. I well recollect one summer sun-rise, amongst the wooded hills and rocky dales of Bohemia, where the thinnest ethereal mist extended over and burst forth, sun-gilt, from the lateral valleys of the tract over which I was travelling on foot; while the sun-throned light lies veiled somewhat above the horizon, and, in fine, burst forth in all his glory, still more superinfusing with his gold the rolling and heaving waves of the mist-like haze. Göethe, who had witnessed similar scenes, says:—

"Aus *Morgenduft* gewebet und Sonnenk larkeit."*

Such a scene given on a large plate by the collodion process would be surprising; but we have to leave it with the practical *heliographer* whether it *can* be done at all. Laying before the artist new scopes and new stand-points for exertion and performance, it is this theoretical part of the vast art-science of heliography which may incite invention, and indite new paths for improvement. The grand atmospheric phenomena of the Alps offer still grander gradations of the kind; but the difficulties for photographic seizing are also greater, and must be left to the future.

I shall not dilate here on the famous and gorgeous sunsets of Paris, as seen from the Tuilleries Gardens, &c., being familiar to most of my readers. Proceeding thence to the South of France, it is at Lyons where a notable change of light and atmosphere is observed. If one leaves Paris at the beginning of April, when everything is yet nearly hibernal, and runs down to Lyons and meets with fine weather and a complete spring, the observation of atmospheric diversity will be stricking. Looking from the windows of one of the hôtels on the Rhone on the splendid gothic edifice of the Cathedral, we perceive that we have reached another feature of European nature—the south transalpine. There is in the morning hours a certain most tender sunny haze and glare surrounding every object in view; and the shades of these many cornices, finials, &c., are projected in quite a peculiar way, very different from that in our northern climes. Göethe, who possessed the gift of the most delicate observation, alludes to this peculiar condition of Italian (southern) atmosphere in the most pointed manner, during his Italian journey, and on several occasions. He writes from Palermo:—"The vegetation presents altogether a peculiar green colour which we are not accustomed to, either more yellow or more blue than with us. But what imparted to the whole sight a most wonderful charm, was a sort of strong breath (starker Duft) or haze which was uniformly diffused over the whole, so much so, that objects even only distant a few paces from each other were separated by a light blue glare or haze, and thus their natural colours almost vanished away, or reached the eye with a peculiar blue admixture. What wonderful effect such a haze imparts to distant objects, ships, and promontories, is very remarkable to an eye experienced in the picturesque, as the distances of objects are to be calculated, nay ascertained; wherefore a walk on these heights was exceedingly charming. One does not see any more nature, but rather pictures, that the most skilful painters could not have perspectively separated by any ingenious process. [*Lasiren.*]"

It is true that Claude Lorraine, Poussin, and Turner have, in several of their pictures, endeavoured to render this peculiar, dreamy, phantastic appearance of the southern atmosphere; but I venture to express the opinion that they have never reached it. It is an object worthy of the experimentalising and thinking photographer to see, whether by any of the extant processes or any one yet feasible this peculiar climateric nature-illumination could be fully rendered or approached, always understood to be assisted and completed by some subsequent colouring and tinting process, yet *hidden* in the womb of time.

Whenever the time shall have come that *Itineraria Photographica* and similar *Pracht-Worke* (splendour-works), as the Germans call them, shall be contemplated, works illustrative of the traces of *great men* will occupy a conspicuous part of photographic literature. But nothing can ever, in sublime inland scenery, be compared with *Vaucluse*, where amongst mountain solitude Petrarch passed many years of his life. It is a valley picturesquely winding, surrounded by hills covered with all the fairness of southern vegetation; and in the back ground rises the giant rock pyramid, nearly 800 feet high, out of the spacious cavern of which issues the fountain of the *Sorgue*, then meandering through the valley. Some remains of Petrarch's dwelling-place enhance the fairness of this sight, almost constantly superfused by the sun-glare of a Provence sky. Whenever the art of tinting (and colouring!) shall have been brought to perfection, such heliographic plates will range amongst the fairest ornaments of our dwellings.—Proceeding south, in *la belle France*, the *Vista*, near Marseilles, called by some *Marseilles en Afrique*, claims our attention. It is the elevation where the sea and town are perceived first by the inland traveller—a sight so grand, that it forcibly struck the great landscape painter *Vernet*, who afterwards painted *Antibes*, with its orange-groves. There is a grand perspicuousness and pellucidity and vibration of the air, if we may say so, observable in many of those Mediterranean seasides and sea-views—an expansiveness of the sun's glare, which made them the favourite haunts of Byron, Shelley, and Keats. The view also from *Notre Dame de la Garde*, ranging over a wide expanse of the Mediterranean, which, when quiescent, is rippled and furrowed by some hitherto unexplained streaks and lines, will yield plates worthy of that approaching national and people's *art-life* and art-enjoyment we all have so much at heart. The towering rocks

* Woven out of morning perfume (?) and sun clearness.

bounding the seashore of Marseilles will be the more interesting subjects, as it were those which the Carthagenians, in times of old, skirted in their then rude yet daring crafts. In genial seasons and weather these places swim in a glare and haze of the fairest light and balm.

CELESTIAL PHOTOGRAPHY.

We have received the following note from our friend Mr. De la Rue; and though the corrections given below are rather amendments of awkward phraseology employed, consequent upon the hasty manner in which reporter's notes are of necessity taken, than upon matters of fact, we the more readily insert them because of the very interesting nature of the paper itself, which we are anxious to make as complete as possible :—

110, *Bunhill Row, London, E.C., October 3rd*, 1859.

My Dear Sir,—I have sent you by this post a copy of your Journal with corrections of your reporter's account of my communication. It is wonderfully faithful, and gives a good summary of my paper, which I curtailed considerably in reading, in order to allow of other communications being read in section A, before which there were a great many papers on the day I gave an account of my doings. Yours very sincerely,

George Shadbolt, Esq. WARREN DE LA RUE.

CORRECTIONS.

PAGE	COLUMN	LINE	FOR	READ
241	1st	last	Mr. Hoggins	Mr. Huggins.
,,	2nd	9th from top	of photography	of *stellar* photography.
,,	,,	18th ,,	rings being always	rings *are* always.
,,	,,	23rd ,,	a telescope to be turned	a *suitable* telescope turned.
,,	,,	28th ,,	come	*course*.
,,	,,	10th from bot.	which	*and*.
242	1st	4th & 5th from top	one second	*two* seconds.
,,	,,	14th from top	size	*image*.
,,	,,	16th ,,	them	*the photographs*.
,,	,,	17th ,,	good copies	good *positive* copies.
,,	,,	27th ,,	notation	rotation.
,,	,,	31st from bot.	reflected. I have however within	reflected *without some contrivance for removing the small mirror*. I have within.
,,	,,	24th ,,	began	begun.
,,	,,	20th ,,	Steenheil's	Steinheil's.
,,	,,	16th ,,	place	plane.
,,	2nd	1st from top	Portraits	*Portions*.
,,	,,	4th ,,	hence	*therefore*.
,,	,,	26th ,,	libration, in	libration, *and its librations*, in
,,	,,	40th ,,	taken	*exhibited*.
,,	,,	30th from bot.	enclosed by a ring	*encircled* by *its* rings.
243	1st	5th from top	one day	one, *two, or three* days.
,,	,,	7th ,,	the interval	*those* intervals.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The Ordinary Monthly Meeting of this Association was held at Myddelton Hall, Islington, on Wednesday the 28th ultimo.

George Shadbolt, Esq., Vice-President, in the Chair.

The minutes of the previous meeting having been read and confirmed, the Chairman stated he had received a very interesting paper from one of the members, Dr. R. L. Maddox, *On the Paraffine Paper Process*, which he then read to the meeting [see page 235], and also the following note relative to the same subject, which he also read, and exhibited many of the negatives on paper produced by the author : —

"*Woolston, September* 27, 1859.

"Dear Sir,—If on perusal you do not condemn me as trying to encumber your *embarras des richesses* for to-morrow evening, perhaps you may have an opportunity just to allude to a fact, which hitherto I am not aware of having been before noticed (on this I may be wrong), and possibly eventually assist us in perfecting some "Modified Waxed-Paper Process." Iodide of zinc I find to be soluble in belmontine : this did not surprise me, knowing that the metal combines with the alcohol-radicle, as we have zinc-methyl, ethyl, and amyl, yet I anxously waited the opportunity to test its photographic powers on paper prepared with it and *Japan vegetable wax*, on which you certainly must deem me rather favourably impressed, *n'importe*. As a comparison I tried also the Japan vegetable wax with belmontine, combined with iodide and bromide of ammonium, on papers prepared with albumen according to the plan suggested by you in the Journal for August 1st. Belmontine, six oz.; Japan vegetable wax in shreds, two drachms; iodide of ammonium, thirty grains; bromide, six grains, each crushed. Bottle set in hot water and shaken repeatedly; filtered after eight hours. Turner's albumenised paper soaked in same for twenty minutes, dried suspended, sensitised after formula in my former contributions to your Journal, floated on water, dried, exposed one and two minutes dull light, Voigtlander ⅝ central stop, and 23-36 seconds, &c. Again — belmontine, six oz.; Japan vegetable wax, 1½ drachms; iodide of zinc, twenty-seven grains; iodide cadmium, six grains. The iodide zinc dissolved readily; the cadmium appears to be much less soluble—no free iodine used to either solution. Turner's albumenised paper soaked in this twenty minutes, exposure as marked on back, *i.e.*, one minute and a-half, moderate sunlight, developed with pyrogallic acid, six grains; glacial acetic acid, one and a-half drachms; rain water, six oz.; two drachms of this—one drachm of saturated solution galic acid, with Beaufoy's acetic acid, and a few drops of twenty grains solution nitrate of silver. I am sorry that they are not better focussed, but one of my slides is not quite correct, and I have a difficulty without trial to make the proper correction if the thickness of glass used in the slide at all differs. However these are the negatives, *un fait accompli!* and as they are the first, why please look on them with indulgence. The iodide of ammonium one developed very slowly, half-an-hour, at which time the developer was not discoloured; the iodide zinc one quickly, twelve minutes, the solution slightly discoloured. It really seems worth while to run over some of the other metalic iodides, and also to try other developers, which if all be well I may ere long attempt, and trust to the pleasure of communicating the same to you. Thanking you for all past favours, and wishing hearty success to the Society and Journal under your auspices, I remain with compliments, dear sir, yours faithfully,

"R. MADDOX."

A vote of thanks was accorded to Dr. Maddox for his paper, &c., and an animated discussion eusued.

Some *very* beautiful photographic copies of prints were laid on the table by the Secretary for the inspection of the members.

Mr. Shave exhibited some superior stereoscopic pictures—scenes in North Devon, &c., taken by the Fothergill process: there was an entire absence of stains and markings, which caused much inquiry. Mr. Shave was of opinion that the cause of success was to be attributed to using a collodion specially prepared for the purpose, as he had not taken more than ordinary care in the preparation of the plate.

Mr. Hislop exhibited pictures 9 × 7, wet collodion (orthoscopic lens), taken in the neighbourhood of Edenbridge and Tonbridge. They were much admired for their beauty of detail and general artistic effect.

A large photograph was presented by Mr. Moens for the portfolio of the Association. Thanks were voted to him for his present, to the gentlemen who had exhibited pictures, and to the Chairman. The Meeting then adjourned till October 26th, when Dr. Ryley *has promised* to communicate the result of further experiments on his *Modification of the Collodio-Albumen Process.*

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Members are reminded that the first meeting of the above Society for the ensuing session will be held in the large room adjoining the Lecture Hall, Carter Street, Walworth, on Thursday the 20th inst., when gentlemen desirous of joining are requested to attend.

Letters for information respecting the exhibition of apparatus, reading of papers, or terms of admission, to be addressed to the Hon. Secretary, Mr. A. H. Wall, 11, The Terrace, Walworth. S.

Photographic Society of Scotland.—In our advertising columns will be found an advertisement announcing the fourth Annual Exhibition of this Society, which is intended to be opened at Edinburgh on the 16th December next.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. VII.

We remained four days in the Jordan Valley. On the morning of the fifth a pleasing incident occurred which is worth relating. We rode down to the Jordan at the pilgrim's bathing place—the spot where it is said Christ was baptised—and we stood on the bank, watching the flow of the river, while I described to John the amusing scene I had witnessed on my previous visit, when the pilgrims were rushing in, and bathing and dipping their shrouds in the sacred stream. The appearance of the river was different now. Its calm flow, the still and lonely banks, the soft gush of the holy water, were unlike that scene when pilgrims of all nations thronged it and sought purity in its stream.

As we stood there, lost in contemplation, a shout from across the river, in pure English, startled us.

—"Who goes there?"

Think of an Anglo Saxon salutation in the land of the Moabites! Who think you it proceeded from? From John's next door neighbour and most intimate friend. He was with a party who had come down from Jerusalem the day previous, camped at the head of the Dead Sea, and were now riding up the Valley, having forded the Jordan to say that they had been on the other side. Catching sight of us, they had hailed us in their own tongue. The

meeting was joyful, and we passed the morning together. They went back to the Holy City in the afternoon, while we struck our tents and rode over to Saint Saba's in the wilderness, where we passed the night in the ravine outside the convent walls. I had tried the inside once and that was enough for me.

The next day we rode to Bethlehem, aud slept in the convent that night, and thence came by the pools of Solomon down to Hebron.

The road from Jerusalem to Hebron lies by Bethlehem. As John desired to see the mosque of Machpelah, I of course accompanied him, and secured a good picture. Therefore I date this letter from the city of Abraham. Possibly my tent is pitched on the identical ground that was occupied by his tent, when the promises were made to him which had their fulfilment in the glorious history of his children — which are yet to have their further fulfilment in the future history of that despised but powerful race, whose children are more numerous to-day than in any former generation, and who are steadily and constantly surpassing the host of heaven in number.

Here, where my tent is pitched, the angels came. Here the patriarch began his weary travel to the hill Moriah, where Isaac was to be sacrificed. Here the story of Hagar had its origin. Here Ishmael and Isaac buried the Father of the Faithful.

The mosque of Machpelah, a Mohammedan building, is jealously closed against Christians and Jews. Rumour has it that last year three American gentlemen and a lady succeeded in effecting a partial entrance, but before they had accomplished their object the citizens, having got wind of it, assembled and surrounded the mosque with hideous shouts, bringing out the travellers, the gentlemen with revolvers in their hands, and that they escaped with their lives only by exhibiting their weapons and evincing a willingness to use them.

The cave of Machpelah is one of those places around which the most interesting of all associations linger. No race of civilised men exists to whom the burial-place of the patriarchs has not more or less interest.

That there is a cave under this great mosque on the hill side in Hebron cannot be doubted. It is a large dark cavern, described more or less minutely by two or three travellers who profess to have seen it. My own Arabs, who go in and out of the mosque freely, speak of it as a vast cavern, into which no one is allowed to enter, and they know nothing of its contents. As usual in Moslem countries there are a dozen small tumuli, like rude graves, or something of that sort, in the open court of the mosque, and nothing more. These are named after the various patriarchs and their wives, who "rest in peace."

Hebron is a scattered city, in a long and somewhat winding but very fertile valley. In the lower part of the town are two ancient pools, doubtless the same spoken of in the Bible, over one of which David hung the murderers of Saul's son.

In the city are some three or four glass-making establishments, but on a small scale, affording employment to not more than twenty hands each. Most of the labourers are employed in the fertile fields of the Valley of Eschol, whose vineyards are as rich and grand as of old. The streets are narrow, dark, and very filthy. The great mosque stands on the edge of the lower part of the city, nearly surrounded by houses.

The locality of Hebron has never been lost, and the Cave of Machpelah cannot be mistaken.

I am always falling into scrapes, and my usual luck attended me here.

Accompanied by Hassan I strolled through the town in search of eligible photographic sites. There are some parts of every city on earth into which if a stranger goes he will be likely to fall into trouble. But Hebron is all alike in this respect. My ignorance of Arabic was my protection in this as in former instances. I found myself penned literally in a corner. About thirty of the rascally Hebronites had surrounded me, and I took refuge in the sharp angle of two houses and stood at bay, with a revolver in each hand, ready to fight it out. Hassan had run out of the city gate as fast as his legs could carry him, to look for John, shouting "Howajji Yehyeh!" and soon returned with my formidable friend, running in double quick time.

One of the rascals had taken up a stone, as big as his fist, to throw at me. I immediately covered him with my revolver, when my eye caught sight of John's felt wide-awake.

"I say John, just tell that yellow-skinned rascal that if he don't drop that stone in three seconds, I'll drop him!"

The successor of Ishmael had not appreciated the danger of his position until John explained it, and then he and the stone fell together. He was utterly astounded at the danger he had escaped, and the more so when I gave them a little specimen of the man they had to deal with. John assured them that I carried in my hands and pockets the lives of half Hebron, and that he had the other half in his.

"Show them a little sharp-shooting, parson," said he, taking off a dirty tarbouche from the head of a boy, and tossing it into the air. Crack went my revolver, and down came the cap with two holes in it. "*Mashallah!*" shouted a dozen voices. John gave it back to the boy with some coppers to pay for mending the holes in it. The crowd respectfully withdrew and allowed John and myself to walk off unmolested.

"How did it happen, parson?"

"I really dont know! These dogs don't understand my tongue and I dont understand their's, and mistakes are natural. I was rambling down a street, and lost my way: hailed an old fellow with beard and turban, and when he went by me without replying I overhauled; he yelled; thought perhaps I was Satan: his townsmen came to his rescue, cornered me, and the temptation to fight it out was irresistible when you came up."

If ever you expect to visit Moslem lands, let me beg, if you value your peace of mind and sanity of body, not to go without some such stalwart champion as my friend John Weston. It is impossible to avoid getting into difficulties; and a Moslem mob is very daring in the presence of a solitary infidel, whereas two are almost as good as twenty. We never go out without two six-shot revolvers a-piece, and as we never miss aim or fire, there's a couple of dozen foes *hors de combat;* and sometimes John carries three with him, making thirty-six shots in all. Verily, eastern travellers are very much indebted to Mr. Colt for his invention.

A mile or so up the valley from Hebron is a vast tree, said to be the Oak of Abraham, whereof there are various traditions. It is a fine large terebinth tree, venerable enough looking to pass for a contemporary of the Father of the Patriarchs; but, if the truth were known, I suppose it would prove not more than four or five hundred years old. A little way from this, on the road to Jerusalem, are ruins called the house of Abraham, where the Moslems say his dwelling stood. They are probably the remains of a mediæval church or convent.

I have spoken of the glass factories of Hebron. These manufacture scarcely anything but small bottles and rude glass beads and bracelets — the latter being mere bands of coarse coloured glass, but they form a great item in the trade of Holy Land, and passing caravans distribute them from Cairo to Damascus.

As evening fell on this old valley, so soon as I had been rescued by friend John, we took our seat in our tent door, imitating the father of Isaac, and waited for angels. With the starlight they came, the angels of peace and joy — delicious memories of home!

One by one the grand events in the history of that valley of Mamre passed before us. The scenery of Abraham's life, his purchase of a grave, his death and kingly burial, the life of Isaac, the strife of Jacob and Esau, the burial of their father, the royal pageant that came up from Egypt to bury Jacob — then scenes in the life of David when he held court in Hebron, and then — even as we sat together and talked, while the stars shone on us, and a moonlight that Leah might have loved, silvered the minaret above her tomb, we grew silent and heard — I heard — the lapse along its banks of the sedgy Ouse, far away, and the voice of one beloved; and wrapping my cloak about me, and falling back on my camp bed, I slept calm, deep, and blessed sleep.

Once in the night I awoke. A low murmur of voices outside the tent had disturbed my visions of far lands. The door curtain was raised as I had left it, and I could see Hassan and his followers sitting around the camp fire, their eyes flashing in the changeful light as they watched the dark hours through. I knew that he would not sleep till I arose in the morning, so I lay back, and with my eyes fixed on the strange group, lost consciousness, and slept again. Now my dreams were troubled and I awoke at dawn.

As the sun rose I walked out on the hill back of the Quarantine Station, and breathed the fresh south air that came up from the desert. Hassan followed me, and begged me to go down to Wady Mousa and the Rock City. It is but four or five days gallop from Hebron, and we could do it easily, he said, and his people would rejoice to welcome us among the Alaween. The temptation was great, but I decided for the present to postpone a visit to the valley of Moses.

So here in the morning, on the plains of Mamre, I have added this letter to the pile in my folio, waiting an opportunity of forwarding them to you. When will the East have its Rowland Hill?

D.T.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER V. *(continued).*

The Use of Water Colours.

Upon glass positives water colours should be seldom used, as their effect upon such surfaces will always be strikingly inharmonious and offensive to good taste, although a touch or two may sometimes be carefully applied to produce the sparkling high lights of jewellery, lace, &c., as I have already stated, and are also, as I shall explain, necessary in the treatment of certain defects.

TO COLOUR AND IMPROVE AN INFERIOR POSITIVE.

To do this may very frequently (as in the case of a bad picture being the sole relic of a deceased relative or friend) be most desirable. Suppose, then, we have before us one of those leaden-hued ghostly positives, which somebody has bought very dearly at an exceedingly low price. Here it is in all its ugliness, either pallid and indefinite in a thick white fog, or sooty and begrimed in a black one. Suppose it to be the former. In the first place, if necessary, we "put in the eyes" with a fine sable pencil and a little Indian ink, carefully strengthening the line round the iris, and touching in the pupil with a neat clean touch; the eyelids and lashes may be marked with the same, and, if required, the nostrils and line dividing the lips also. This done, take a little of the powder grey, and with it strengthen the barely visible half-tints, doing the same for the lights with the powder white, being careful *not to touch the wet with the dry colours*, as the latter would adhere to the former far more strongly than to the collodion surface, and would not admit of softening. The hair may be strengthened with the Indian ink, and then the varnish can be applied; after which, proceed to colour as usual.

And now suppose we have the "under-developed" and "under-exposed" positive (the black one) to operate upon.

The sockets of the eyes are a dense black mass, in which the optics are nearly or entirely lost. To bring them out, use Indian ink and Chinese white (water colours)—the former for the markings or drawing of the eye; the latter, with very light careful touches, for the lights and the white portion of the eye. Next take your dry white and work it into the high lights, and mixed with a little grey into the half-tints, until the image begins to show some little signs of roundness, although it now appears a very coarse chalky smudge. After this, varnish and colour as usual.

But although thus much may be done to remedy these defects, *such* productions cannot be *much* improved by any process.

COLOURING GLASS POSITIVES IN OIL.

Oil colours are used with most effect and greatest ease on paper, but as they are also frequently used upon collodion, I may as well inform you that it is advisable to coat the picture with pale drying oil, and allow it to dry before commencing the colouring. Practical details may be looked for in my future chapters upon colouring in oil.

COLOURING ALABASTRINE POSITIVES.

Although these positives have a delicacy and beauty peculiarly their own, they have also a cold chalky appearance, both before and after colouring, which render them no especial favourites of mine. I doubt also if they are permanent. Although we decline taking them, myself and partner purchased the secret of producing these pictures, but we might have obtained the same for a very trifling expenditure had we known that in Archer's pamphlet on the Collodion Process, published in 1854, the method had been fully described. Positives whitened by the usual saturated solution of bichloride of mercury have a cold bluish tint and will not receive the ordinary varnish without turning deeply (but not beautifully) blue. Although it is somewhat out of my province, the reader will perhaps thank me for quoting the passage above referred to from Archer's little book:—

"Before commencing the process of whitening a picture, it should be considered whether the collodion with which it is made is strong enough to bear without injury the application of the very corrosive compound employed.

"The acid solution of corrosive sublimate would very soon destroy the little remaining tenacity of a weak collodion, and the operator would have the mortification of finding that his picture, although able to bear the application of the whitening solution, would fail altogether to resist the action of water in the after washing.

"To resist, therefore, the rough usage the picture will have to undergo, it should be made with tolerably strong collodion.

"Prepare, first, a saturated acid solution of corrosive sublimate (bichloride of mercury):—

Bichloride of mercury	2 drachms.
Muriatic acid	2 "
Water	6 "

"This will form the normal solution, to be diluted when occasion may require.

"After thoroughly washing the picture to free it from fixing solution, and while still moist, cover it rapidly at one motion with a weak solution of bichloride of mercury, made with—

Saturated solution (bichloride of mercury)	1 part.
Water	10 parts.

"After the plate is fairly and evenly covered, the greater portion of this liquid is drained back into the cup, and a drachm of the saturated solution is added to it and applied, after which the picture will rapidly whiten.

"This operation may occupy from one to three minutes and sometimes longer.*

"When the whitest effect is produced the picture is carefully washed with a stream of water; afterwards put by to drain, protected from dust, to be varnished with white lac varnish."

Such is Archer's process of producing what *he* calls simply enough "whitened" pictures, and *we* term "alabastrine."

In adition to the above I will add, that the time occupied in whitening may be shortened by putting the plate upon a gilding stand, and *gently* warming it by the application beneath of the spirit lamp — that the positive *must* be a good one — that it should not whiten too quickly — and that hot water is best to free it from the solutions, after which it may be rinsed in cold.

The lac varnish recommended should not be used for colouring upon, but in its place one compounded of benzole, gutta-percha, crystal varnish, &c., but which however can be more easily purchased than prepared;† the colouring is not commenced upon the collodion, in consequence of the metallic deposit upon the surface, but after varnishing.

The method already given is that to be adopted in the colouring, except that a general increase of warmth in the tints is desirable; the new absorbent colours answer excellently for these pictures, and, in fact, are as effective upon any of the varnishes used for colouring as upon a surface prepared with the solution more particularly intended for them. Black varnish quite destroys the beauty of alabastrine pictures, they should therefore be backed up with a rich maroon velvet. In fitting them into cases, SECURE them from the air with gummed paper.

NON-INVERTED CHROMO-PHOTOGRAPHS.

Alabastrine pictures after being coloured may be treated with a preparation, sold by Mr. Newman, of Soho-square, under the name of "penetrating varnish," which has the effect of rendering the colours visible upon the side contrary to that upon which colour has been applied. These pictures, apart from the advantage of being non-inverted, retain the minutest details of the photograph, which is in this case *on* instead of *under* the colour. It is evidently important that the whitest glass should be used, and that the tints selected should be from the more powerful, as also from those which receive the most permeating power from the "penetrating varnish." Some few experiments will best decide the latter point, as the results are variable.

The author of the preceding paper has, in order to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

G. R.—The new absorbent colours may be varnished in the same way as others. As you say, it is no small advantage to finish the colouring entirely before varnishing, for not only are the colours more permanent, but when viewed obliquely they have not the chalky smudgy effect which such colours necessarily have when unvarnished. This is one of the greatest advantages offered by Messrs. Reeves's new colours.

Miss D. (Kingsland).—Use your medium thinner or more freely, as your colour is laid on too thickly. A proper body of colour on the lights does not necessarily imply coarseness; and although mere smoothness is a quality scornfully and suspiciously regarded by critics, it pleases the general public, and is no real disadvantage. With regard to your other questions, pardon me if I refer you to the forthcoming chapters upon colouring in oil. Read the Maxims *again.*

M. (Guernsey).—For practice colour upon large heads, use less colour in your brush, and work in smaller circles. I am most happy to have been of such good service to you. A. H. Wall.

* Generally longer; much longer is I think best for the result.

† See the advertisement of Messrs. Squire & Co.

Letters to a Young Photographer.

No. XXI.

MY DEAR EUSEBIUS,

The third element in the imitation or representation of an object is *colour*. Colour is to Form what Music is to Poetry. In the poem or the statue we have the thought, and the form embodying the thought, the representation of the idea: music and colour clothe the thought in melody and harmony, and the utterance is then for the artist, now completed in the song, the symphony, and the picture.

Colour is a word that has a much wider signification than the common acceptation of the term. It is composed of three elements: of *light*, which is a condition of colour; of *tint*, which indicates its hue or quality; and of *tone*, which indicates its intensity, and is distinct from light, and independent of tint. The genius of a colourist is displayed in his knowledge of the due relation of tones.

Colour, as a means of imitation, is more complex than outline and relief. Most artists entertain the idea that colour is the principal merit in a painting. Where one aims at success and popularity by means of form, there are ten who seek it by means of colour; consequently there is at the present day a tendency and disposition to cultivate colour at the expense of the other two elements, outline and relief. The eye of the ignorant multitude is sooner attracted by the colour of a picture than by its other qualities; and imperfectly educated artists, knowing this fact, hasten to colouring long before they have learned to draw well, and even before they have scanned the rudiments of *chiaroscuro*. Our picture exhibitions are as gaudy as a tulip bed. The luminous colours so abound that the eye is dazzled and bewildered. We have a *brilliant* exhibition, it is true, where mechanical dexterity usurps the place of thought, and poverty of idea is sought to be concealed under the flimsy veil of cadmium yellow and artificial ultramarine. It is on this principle of construction that nine-tenths of our exhibition pictures are manufactured by painters who regard imitation as the end and not the means; but to whom we must, in justice to the thoughtful and conscientious, deny the title of artists.

Do not run away with the idea that I am decrying colour, my remarks apply only to the abuse of its powers and resources. Turner has no greater admirer or more devoted worshipper than myself. But I do not "cotton" to Etty. Turner was a grand experimentalist, whose every picture was a rush and a plunge into the unfathomable abyss of light, and had his rare natural instincts been governed and guided by science, he would doubtlessly have carried the art of colouring to its highest point of perfection. It is easy for any one acquainted with the laws of the harmony of colouring to see what Turner aimed at in his pictures, even in those considered the most extravagant by the uninitiated; it is also easy to see how the little knowledge he lacked would have carried him straight to a successful issue, and embodied on his canvas the aim he, in so many instances, vainly strived to attain. Like most great thinkers, Turner "swallowed all formulas," but he could not divert the laws of nature, nor apply them to his purpose without becoming acquainted with them.

Every object has its own peculiar colour, its *local* colour, as it is termed. This local colour is subject to numerous modifications, arising from the form of the object; from the nature of its surface, whether plain or polished, and from the reflexions thrown upon it from surrounding objects. If you take a cube of unpolished wood and place it in any open space upon a piece of black cloth, its local colour will be as little disturbed or modified as it is possible to be; but place it on a piece of white or coloured cloth, or carry it into a quadrangle constructed of white or coloured bricks or stone, and each side of the cube will undergo considerable modifications in its local colour, all of which would be appreciable in a photograph of the cube, much more so perhaps than to the eye. This is the simplest form of experiment. If we take a body of more complex form we shall have not only the influence of the surrounding objects in modifying the local colour, but we shall also have the reciprocal influence of these modifications upon each other; and a moment's reflection will convince you that these influences, which we call in their totality *chiaroscuro*, is a very difficult and complex affair.

Nothing is better calculated to educate the eye to a due appreciation of the resources of relief and *chiaroscuro* than photography. Its greatest achievements are attained without the adventitious aid of colour, and it has come most opportunely to rescue the public taste from its idolatry of that which only pleases but cannot inform or elevate its thought. I have before me some very fine engravings of architectural subjects, and good large photographs of the same, and I may say that it is through a long examination and careful comparison of the two modes of representation that I have arrived at a due appreciation of the complexities of *chiaroscuro*. And yet this is but half the subject: the complexities arising from colour are, in the present instance, wanting. You may appreciate the complexities arising from coloured reflexions mutually acting upon each other by the following experiment — Take a cubical box and colour the inside with differently-coloured pigments, let the bottom be blue, the two ends red and yellow respectively, one side green, and the other violet; place the violet side downwards on a table, and then cover it over with a piece of unglazed black paper, and look into the box, standing at some two or three yards distance. If the light be good you will see each side of the box modified in its local colour, not only in tone but in hue; and these modifications may be varied infinitely by substituting for the black unglazed paper, papers of other colours, and of white. It is not necessary to specify what these modifications are, but simply to observe them, so as to obtain a distinct conviction of their action and its importance.

Colour is a condition of light; without light there can be no colour. In painting we do not imitate first colour and then light, but confound them together, and produce both at the same time. We can produce the effects of light in a picture without the aid of colour, in the ordinary acceptation of that term, by means of perfect *chiaroscuro*, as may be seen in the works of Rembrandt, where the whole palette of the painter consists only of browns, and black, and white: a spot of white on the tip of the nose will bring more sunshine into one of his pictures than the richest palette Turner ever held. Therefore light can be imitated without colour, and the gaudiest colours may fail to produce the effect of light the artist aims at.

From colour as a condition of light we turn to colour as hue or tint. Our standard of colour is obtained from the decomposition of a ray of light by a prism, producing what is called the prismatic spectrum. This consists of six simple colours, three of which are termed primary, viz., blue, red, and yellow. Binary compounds of these with each other yield secondary colours, viz., green, orange, and violet. These prismatic colours are termed normal colours, that is to say, they are taken as the types or standard of colours; when we speak of blue, red, and yellow, we must understand these colours in their purity as they appear in the spectrum, and not as they are presented to us by our pigments, as Prussian blue, or gamboge, or carmine. None of our pigments, except ultramarine, are pure representatives of the colours of the spectrum. Most of our yellow pigments contain also blue or red, which gives them a green or orange hue. Most of our blue pigments contain also red or yellow, which gives them a violet or green tinge. While most of our red pigments contain also blue and yellow, which gives them a violet or orange tinge. This is a matter requiring very serious consideration in the mixing of pigments to obtain a given hue. For instance, if you wish to obtain a green, which is composed of blue and yellow only, you must be careful to mix together such pigments as contain no red, for if red be combined with blue and yellow a certain quantity of black is produced by the combination of the three primaries, which tarnishes the purity of the green. The same rule applies to the mixture of other coloured pigments. Theoretically, the union of the primary colours produces white, but the mixture of primary coloured pigments produces grey, owing to the impurity of the colours of the pigments.

The primary colours being three, the secondary colours are three also; two primaries go to form a secondary, and this secondary colour is complementary to the primary omitted from its composition, and *vice versa*. Thus blue and yellow form green, which is complementary to the omitted primary *red*, as red is complementary to green. We shall have to consider these complementaries hereafter, as they form a very important feature in the science of colouring. Although there is but one pure normal type of the three primary colours, there are many varieties of the secondary colours, green, orange, and violet which are also pure. These are *hues* depending upon the greater or lesser quantity of one of the primaries; thus blue and red will produce violet, purple, indigo, lavender, hyacinth, and other hues of violet, all equally pure, so long as yellow is kept out of the combination. Green revels in an infinite variety of hues, all equally pure. Orange being composed of two similar colours, is more limited in its range.

I do not speak of *tertiary* colours, as that word has no definite meaning. What is meant by those who speak of tertiary colours is simply the endless combination of the three primary colours in

unequal proportions, producing greys, or browns, when red predominates in the mixture.

We have now to consider the *tones* of a colour. Tone is the same as intensity; if you paint a panel with a mixture of normal grey, composed of pure black and white, commencing at one end with pure white, and gradually deepening in intensity until it reaches black at the opposite end of the panel, you will have all the tones of normal grey. If, when dry, you cover the grey with a coat of transparent colour, whether simple or compound, you will obtain all the *tones* of that colour, therefore we say that the tones of a colour consist of the modifications the pure pigment undergoes by the addition of white, which heightens its tone, and of black which lowers it.

Photographic Glossary.

Uranium—A metal obtained from *pitchblende*. It is usually obtained in the metallic state by decomposing the protochloride with sodium or potassium. In colour it is like nickel and iron, but soon tarnishes upon exposure to the air, becoming yellow. It dissolves with evolution of hydrogen in dilute acids, forming green solutions. It forms four compounds with oxygen. The specific gravity of uranium is 18.4.

Uranium, Oxides of—The combinations of uranium with oxygen are the protoxide, the sesquioxide, and two intermediate oxides, which may be regarded as compounds of the other two. *Protoxide of uranium* was for a long time mistaken for the metal itself: it appears in the form of a grey or brown earthy powder; sometimes in crystalline scales of a metallic lustre. *Sesquioxide of uranium* is used for imparting a delicate yellow hue to glass—the glass thus coloured is called *canary* glass, and completely intercepts the chemical rays of light.

Uranium, Nitrate of, is formed by the metal or either of its oxides with nitric acid. It crystallises in prisms of a lemon yellow colour. The solution of this salt possesses the power of lowering the refrangibility of rays of light which fall upon it, producing the peculiar phenomenon called *fluorescence*. Nitrate of uranium has been employed by M. Nièpce de Saint Victor, and by Mr. Burnett, as a substitute for nitrate of silver in the positive printing process.

Uranium Printing Process.—The paper used for taking the proofs must be kept several days in the dark previous to use, and handled with great care. It is floated on a bath composed of nitrate of uranium one ounce, distilled water five ounces, and then dried in a dark place. It will keep thus prepared for any length of time. To take a proof expose this paper under a negative from one to ten minutes in the sun, or from a quarter of an hour to an hour in diffused light, according to the intensity of the light. A faint impression only becomes visible, which is developed by floating the paper on a bath containing one ounce of nitrate of silver dissolved in a pint of distilled water, to which a drop of acetic acid is added. The image appears immediately. The proof is then washed in several waters. It may be immersed in the following bath, composed of water thirty-five ounces; chloride of gold thirty grains; hydrochloric acid two or three drops; this bath develops the picture more rapidly than the nitrate of silver. The prints become much more vigorous if dried at the fire. This is the original process proposed by M. Nièpce de Saint Victor: it is capable of receiving many modifications, most of which have been described in this Journal.

New Books.

Instructions for the Successful Practice of the Fothergill Dry Process; *also Remarks upon the Preservative Dry Processes Generally, &c.* By Alfred Keene, Chemist, 115, Warwick Street, Leamington.

This is one of the little pamphlets that one of our correspondents stigmatised, a short time back, as being "worth nothing, as it is to be had for nothing"—that is, to purchasers of a certain quantity of the collodion made and sold by the author.

We objected to the libel at the time, and in the present case we do so emphatically. It is not adapted to those who know nothing at all of photography, but gives very ample instructions to those acquainted with the working of ordinary moist collodion, and are desirous of mastering any of the dry processes; for though that known as Fothergill's obtains by far the largest share of notice, many, not to say most, of the details insisted on for working that satisfactorily are also more or less applicable to the others.

Mr. Keene has not confined himself to one rigid line of action, but has, in our opinion, acted most wisely in pointing out how, by strict adherence to the principle involved, much latitude in mode of manipulation may be allowed without interference with the results, and thus a considerable choice of routes is offered, all leading to the same goal.

We have also been favoured with a specimen stereograph of Warwick Castle, which gives a capital idea of that noble structure, and illustrates favourably the process advocated so strongly and so well by the pamphlet, which, by the way, we perceive, on again looking at it, is to be had for a small charge by those who are *not* purchasers of the collodion.

Foreign Correspondence.

Paris, October 12, 1859.

The return of the publishing season brings with it a fair instalment of photographic literature. Some four treatises, three of them new, and one a new edition, have already appeared, and more are promised anon. First among them is M. Chevalier's *brochure*, which is not a systematic treatise on heliography; but, like his previous publication, a collection of essays by various photographers, MM. de Brebisson, Civiale, Bacot, Adolphe Martin, Festeau, de Nostitz, and Baillieu d'Avrincourt, with notes by M. Nièpce de Saint Victor upon the colour of proofs, and two articles by M. Chevalier on photographic optics. The value of this work must be apparent, seeing that the component parts are contributed by skilled practical photographers. The next work is *L'Art du Photographie*, by M. de la Blanchère, whose reputation as a scientific photographer stands very high. His book is not an elementary treatise, but comprehends photography on paper and on glass, in which the formulæ producing the best results are given. The author has preferred to treat of the artistic and intellectual part of photography rather than of mere manipulation. The reader is presumed to be already familiar with the ordinary processes, and with sufficient knowledge of chemistry, to enable him to comprehend the philosophy of his proceedings. One merit the book possesses, which will render it invaluable to the photographer—everything in it is the fruit of the author's experience, clearly and conscientiously stated.

M. Robiquet has published his *Manuel Theorique et Pratique de Photographie*. This is an elementary work, containing numerous wood-cuts, illustrative of the chemistry of photography and of the various manipulations. The latter section occupies 107 pages. The third section comprehends the history and theory of photographic phenomena. M. D. Van Monckhoven has ready a new edition (the third) of his *Traité Général de Photographie*. The favour with which the former editions were received will doubtless be extended to the present. The author is well known as a scientific photographer, and has contributed many valuable essays to the perfection of the art. While writing this, yet another little *brochure* has been placed on my table, *Photographie Elémentarie*, by M. Georges Robert. It is intended as a first book for beginners, and treats of photography on glass and paper. I have not yet had time to examine it, but I do not expect that it will call for any lengthened notice.

M. Nièpce de Saint Victor has contrived another very ingenious and interesting chemical photometer. Into a wide-necked flask or bottle introduce a saturated solution of oxalic acid with some undissolved crystals resting on the bottom of the bottle. Into this solution throw a given quantity of a solution of nitrate of uranium, or simply of oxide of uranium. The bottle is hermetically closed by a cork, through which a straight graduated glass tube is passed through the liquid, and the upper portion of which rises a certain height above the cork. Thus arranged, if left in the dark, the bottle shows no particular phenomenon, the liquid in the tube remains at the same level as that in the bottle; but if it be exposed to diffused light, or to the direct light of the sun, the oxalic acid, under the influence of light, aided by the presence of the salt of uranium, is decomposed, with the formation of carbonic oxide, which rises in the flask, and pressing on the surface of the liquid, causes it to rise in the tube with a rapidity and abundance proportionate to the chemical intensity of the light. This simple little apparatus works remarkably well. It only remains to determine whether the proportion between the disengagement of the gas and the chemical intensity is perfectly established, and whether we can by this means accurately measure the quantity of the chemical action of light—whether it be diffused or solar at different hours of the day, and in various seasons and at various places—and if, in a word, this mixture suggested by M. Nièpce de Saint

Victor can wholly replace the sensitive gaseous mixture proposed by Messrs. Bunsen and Roscoe. The diameter of the tube, and the best mode of dividing it, must be ascertained by experiment.

In my letter of, the 10th ultimo I briefly described another photometer, under the name of the *solar pile*, invented also by M. Nièpce de Saint Victor. I am now enabled to supply a more detailed description. Through the cork of a wide-mouthed bottle we introduce two metallic plates, one of zinc the other of copper, to which are soldered two copper wires, and forming together a small simple pile. The liquid or mixture put into the bottle is the same as that of the preceding apparatus, a solution of oxalic acid and of nitrate of uranium. If we complete the circuit, even in the dark, an action commences with the evolution of a current which sensibly deflects the needle of the galvanometer. But if the bottle be exposed to the light, the action is much more energetic and vivid, and the quantity of carbonic oxide is very considerable. It may be seen to disengage itself under the form of smoke or transparent cloud. Up to a certain point the oxide or nitrate of uranium may be replaced by nitrate of perchloride of iron. J. P.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

HONOUR TO WHOM HONOUR IS DUE.

To the Editor.

Sir,—I find in the report of the meeting of the Chorlton Photographic Association it has been omitted to be mentioned that I was enabled to present the photographs through the kindness of Mr. Ebbage, from whose negatives they were printed. The insertion of this in your next will oblige.

I am, yours, &c.

ALFRED KEENE.

Leamington, Oct. 4, 1859.

WHITE POSITIVES ON GLASS.

To the Editor.

Sir,—Some time ago I sent you an account of my method of working in taking positives on glass, or rather of the materials that I was then using. I lately saw in your Journal a formula for a developing liquid, the principle of which appeared to be sound, although the formula itself, from a misprint of ounces for drachms, was impracticable. Before the correction was published, I had contrived the following modification as a means of carrying out the principle:—

1.	Protosulphate of iron	1 ounce.
	Dilute sulphuric acid (containing ten per cent. of oil of vitriol)	3 ounces.
	Water to make up to	16 „
2.	Spirit of wine	$1\frac{1}{2}$ „
	Water to make up to	16 „

When wanted, mix equal parts of these solutions. Separate they will keep in well-corked bottles for months: whether they will do so mixed I do not know; but I have never found it necessary to reject what has been mixed a week or two, provided the bottle has been corked.

This formula gives a good white not so sparkling as that produced by nitric acid, and therefore more pleasing to most persons. The proportions given answer very well; but I have not had time to try whether they may be varied with advantage. The spirit of wine may probably be reduced to one ounce without injury, its use being merely to cause the liquid to flow freely over the plate.

I am, yours &c.

G. JACKSON.

TONING—RE-DEVELOPING.

To the Editor.

Sir,—In the toning of prints with the alkaline chloride of gold I have been rather annoyed lately. The pictures have toned, to all appearance, very nicely; but, on adding the hypo', they turn red, and rather granulate, and frequently all the half-tones dissolve out. The toning I make with one grain chloride of gold, five ounces water, twenty grains carbonate of soda. Fixing—Hypo' one ounce, water five ounces. Sensitising—sixty grains nitrate of silver, water one ounce.

In the re-developing of negatives with pyrogallic acid, after using iron, I have had occasionally deep orange stains in various parts of the negative. The collodion contains bromide. If you could spare a few lines in the next number of your most useful work to help me out of these errors, I should feel obliged.—I am, yours, &c. M. A. H.

[The reddening in the hypo' shows that there has been *very little gold deposited;* perhaps your gold bath has been nearly exhausted. Have you noticed any deposit in your stock bottle, or was the bath freshly mixed? The fault, from whatever cause, is certainly insufficient deposit of gold. The granulation is most probably owing to the size (starch) being entirely removed from the paper by the strongly *alkaline* condition of the bath. We recommend you to try Maxwell Lyte's formula, in preference, for the toning bath.

The defect of orange-coloured stains, when re-developing, is due to the iron solution not being properly washed off before adding the pyrogallic acid and nitrate of silver. Wash and *drain slightly* several times between the two operations; the last washing, before using the pyrogallic acid, should be with distilled or rain water.

HINTS TO LEARNERS.

To the Editor.

Sir,—From the regular perusal of The Photographic Journal, I see that inquiries are often directed to you, asking your advice as to the purchase of apparatus, &c.; but your reply invariably is, that you cannot recommend any particular maker, lest in so doing you should be deemed partial. Of course, then you will not do so publicly.

But suppose you were yourself in want of a good lens, or you had a friend in a similar situation, there is no doubt but you would give your advice as to where he should go to procure one. If he had the means you would probably advise him to go to a first-class house, pay a first-class price, and obtain a first-class article. Perhaps you would say—go to Ross, Voigtlander, or some other of world-wide reputation. But to give £5 or £6 for a quarter-plate portrait combination, and double or treble that sum for a half-plate one, a *poor* amateur would consider paying too dearly for his whistle, when he can obtain *fair* articles at less than a quarter of the price.

I read with great interest and pleasure your report on Derogy's lenses, as not only giving the novice an insight into the features, qualities, &c., of lenses, but also useful advice for enabling him to procure a fair article at a moderate price. In that report you say that the lens examined by you was quite equal to any French one that you had hitherto tried.

I had in my short practice of the fascinating art been led to form a high opinion of Lerebour's lenses, but from your report it would seem that they have no superiority over those made by M. Derogy. I have tried a quarter plate of each of these makers, and though I am not able to state which was the better of the two, yet both of them were superior to one that I have in my possession, and with which I have always worked up to this time.

One of your correspondents, in acknowledging your kindness for the report on Derogy's lenses, asks where he might obtain a suitable camera that might be used with all its various arrangements. This is a question that took my attention, and it must strike every one that an ordinary camera will not do for all the combinations of which it is capable. It is evident that either three cameras at least will be required, or there must be one of great expansive properties.

Cameras are sometimes made of vulcanised india rubber, or some such material, which I believe would answer very well for all three portrait combinations. The price is two pounds or fifty shillings.

I possess a whole-plate camera to which I have adapted a half-plate lens. I took a piece of wood to the cooper's and had an aperture made of the size required, glued it to the inside of the front of the camera, and screwed the brass ring which receives the lens to the *inside* of the camera. I was then enabled to work with my whole-plate camera and half-plate lens. I should not forget to state that I was obliged to take out the pinion which works the combination: consequently I am obliged to focus by means of sliding the camera, or drawing out or pushing in the tube, which I do not find at all inconvenient.

As to plate frames I was sorely puzzled for a time; but taking two strips of deal, I cut out a groove on one side of each, put the strips of deal inside the dark slides, at about the distance of the breadth of the sensitive plate apart; then put the plate on the grooves, shut the door of the dark slide, and found the spring sufficient to hold the plate firmly in its position. The deal strips reach from the top to the bottom of the dark slide, resting on each end; and by sliding one to the right and the other to the left, I have what may be called an universal inner plate-frame, being adapted for all sizes, up to whole plate $8\frac{1}{2} \times 6\frac{1}{2}$.

I have various marks on the inside of the flap of the dark slide, to serve as a guide to putting the plate in the centre; and I have also corresponding marks on the focussing screen.

I can hardly suppose that there will be, *to you*, any thing new in the above: perhaps it may however be useful to some of your correspondents. But whether or not, I beg you to excuse the trouble I am giving you, and if you deem the remarks in any way useful you may use them as you think proper; at the same time, if you take no notice of them it cannot be an offence towards me.

Your remark about sliding fronts is very good. I think it would be very useful to have sliding fronts to every camera, which the amateur should make, or get made, for himself, and which he would do at a very trifling expense. Then, as you remark, he could have them all of one size, adapt-

able to each and all of his cameras. Such fronts would be very useful for testing lenses, especially such as Derogy's, with many combinations. The practitioner would then have nothing to do but to screw the brass ring to one of the sliding fronts: the lens would then be ready for any camera that he might have in his possession. Or by very little ingenuity he might use a lens occasionally without screwing to sliding front at all.

"Necessity" is said to be "the mother of invention;" and I am confident that amateurs in general might do much more for themselves than they are in the habit of doing if they would only try.

When I got one of Derogy's lenses for trial I hardly knew how it was to be attached to the cameras, for I did not at all like the idea of taking off the rings already on in order to attach Derogy's. In fact, I could not have done so, for the lens being one of the quarter-plate patent portrait combination, the aperture in the whole-plate camera was too large. So I again resorted to the cooper, got him to find me a piece of wood of the proper size (about $4\frac{1}{2} \times 6$), make an aperture through it of the required dimensions, which he did in a few minutes, charging me but threepence for it. I then adapted it to the cameras myself, being only the work of a few minutes more. I was thus enabled to take pictures with all the combinations, with one exception; for when using the lens for the smallest pictures with the portrait arrangement, my camera was not of sufficiently short range to obtain a focus. I have gone to a greater length than I intended, but for so doing I hope you will excuse me.—I am, yours &c.

Wakefield, October 5, 1859. A WOULD-BE PHOTOGRAPHER.

[It is not easy for those familiar with all the details of such an art as that of photography to know in what particular points novices are especially desirous of information; we therefore would gladly encourage the mutual interchange of correspondence in our columns, between those *in statu pupillaris*, if we may so term them. Although there is nothing *new* in the preceding letter, we have no doubt that it will be nevertheless very useful to many of our readers.—Ed.]

THE SOLAR CAMERA.

To the Editor.

Sir,—In perusing The Photographic Journal for the 1st and 15th ultimo, I think great credit is due to you for your able and candid assertions regarding *Woodward's Solar Camera:* it is by no means entitled to a *patent*.

It is now more than sixteen years since I assisted Messrs. Adamson and Hill, photographers, *Edinburgh*, in taking a few copies of magnified representations of minute objects by an achromatic solar microscope, which I had made for Mr. Octavius David Hill, Calton Stairs, Edinburgh. (At that time the calotype paper was employed, and of course the outline was not so well defined as with collodion on glass, the latter process not being then known). The objects I adopted were transvex sections of wood, about three-eighths of an *inch* in diameter. The enlarged copies or impressions taken were, so far as I recollect, about eighteen *inches* in diameter. The last time I saw the aforesaid magnified impressions, they were framed and hanging in Mr. James Bryson's shop, Princes Street, Edinburgh; and, as regards patents, Mr. Hill and Mr. Adamson had arranged to lodge a *caveat*, but the premature and lamented death of the latter prevented it.

Messrs. A. and H. already alluded to, had also a camera, about two feet square, fitted-up for taking portraits as large as life; but the imperfections in, and difficulty of, preparing paper so large were against it.

I also made a speculum, of twenty-four inches diameter and thirty inches focus, for the aforesaid, for taking smaller portraits, or to reflect light on the object; but that was never much used.

Next, in your Journal of the 15th ultimo, page 225, you write on "*Photographs of Microscopical Objects*." They are very beautiful and interesting. I have a brother here who has taken hundreds of them with the solar microscope, the greater part of the objects being sections of wood such as you recommend.

You speak of a parabolic or spherical mirror receiving incident rays at an angle of 45° (page 224, Sept. 15). This will never do, because the angle of incidence must be equal to the angle of reflection. Parallel rays, falling incident on a plane mirror at the same angle of incidence, undergo the same angle of reflection; but let the same rays fall on a concave mirror, then the central ray would be incident at an angle of 45°, while those on each side would fall at greater and less angles, and be reflected, giving a very distorted elliptical image, whatever lenses it may be refracted through afterwards.

I am perfectly aware of your capabilities as regards the theory of optics, only your mind must have been otherwise engaged at the time you wrote.

Trusting you will excuse my presumption,

I am yours, &c.

Newcastle, Oct. 6, 1859. THOMAS DAVIDSON.

[Our correspondent has misunderstood somewhat the article to which he has alluded.—He will perhaps perceive by the article in the present number what our meaning is.

We are quite aware of the aberration existing when reflection occurs from a spherical mirror; *but as this is precisely what occurs in a compound achromatic microscope*, in which the *ratio* of enlargement is greater far than would be required photographically, we are convinced that our plan would be practicable and advantageous.

We should not employ anything like such a proportion as twenty-four inches diameter and thirty inches focus, but with such diameters have the focus six feet at least. It must be borne in mind that we do *not require* an image of the source of light for illuminating, and useless rays can be cut off by a diaphragm.—Ed.]

ANSWERS TO CORRESPONDENTS.

G. T.—Pyrogallic acid 1 grain, distilled water $6\frac{1}{2}$ drachms, Beaufoy's acetic acid $1\frac{1}{2}$ drachms.

Papier Moure is not a photographic chemical, although you might have seen it at photographic chemists'.

In Memoriam.—The late Mr. Arthur Heufrey *was* the first Editor of the *Journal of the Photographic Society*.

Smellfungus.—The best disinfectant for the annoyance you describe is a solution of nitrate of lead.

Chemicus.—Sulphuric acid can be obtained economically from sulphate of lime by Mr. Shanks's process.

Walter S.—Silver is generally found in sea-water when sought for in analysis.

C. J. L.—The ounce of 480 grains is no doubt the one meant. How else would it make a forty-grain solution?

Sea-View.—The stereographs named are by Mr. Samuel Fry, of Brighton, See advertisements.

Thos. Price.—1. See the letter of Geo. Jackson in the present number. 2. Add alcohol till it flows.

A Would-be Photographer—*(Great Marlow)*.—Get Hardwich's "Photographic Chemistry." You will find it contains the *best* information that is to be had on the subject.

H. Walter.—After pouring off the varnish hold it before the fire, as well as having the plate warm beforehand. Our nerves are not so easily affected, especially by the *gun* you mention.

David.—You cannot legally sell the negative without permission of the owner of the copyright. The better your negative the less likely is it that you will obtain the permission.

Louisa A.—If you will read the advertisement by the light of common sense, you will soon perceive that, like so many others of the same sort, it promises an impossibility in return for twenty-four postage stamps!

Barnaby Rudge.—The French unit of measures of length, occupying the place of our yard, is the *mètre*, which measures 39.37 inches. It is the length of a pendulum vibrating seconds in the meridian of Paris.

H. Morton (Cambridge).—In water, at a temperature of about 54°, bromide of potassium dissolves in the proportion of 63 grains in 100 grains of water.

A. Mackae (Greenock).—If you prefer to make your own iodising solution, you will find the salts of cadmium preferable for your particular purpose to the salts of potassium or ammonium.

Augusta.—Such an outfit as you desire may be obtained for about Five Pounds. Any respectable dealer will "put up" what you require if you state your wishes clearly in writing.

J. Ford (Boston).—Carbolic acid, phenic acid, phenic alcohol, hydrate of phenyl, are but different names for the same substance. We are not surprised at your perplexity. You will find a paper on the employment of oxyphenic acid in photography on page 225 (Sept. 15th).

A Wanderer.—A treatise, of the kind you need, has not yet been published, but we learn that such an one is in a publisher's hands: it will treat photography in *all* its bearings, chemical, historical, artistical, optical, and manipulatory.

Pyro.—Fahrenheit's scale is always understood, unless otherwise expressed. As a general rule, and to remove all doubt, it is better to place F. or C. after the figures, to indicate either Fahrenheit or Centigrade.

Bandon.—Amateur.—Hy. Robertson.—B. L.—Ignotus.—Most of your inquiries will have been answered in our article on the solar camera in the present number. The tube used by the first does not allow the oblique rays to act. You may employ your portrait combination in lieu of an orthographic one; but if so, insert a diaphragm with about one-and-a-half inches of aperture between the front and back glasses. *B. L.* must give more time when he enlarges to six diameters than when he is content with four. *Ignotus* will not find an ordinary landscape lens do very well: it is too slow.

Chas. Mooreland.—The reason why one of the lenses of the given focal length and equal diameter is better than the rest in rapidity of action, and sharpness of definition, is evident enough. It is not the quality of the glass (though that might influence the result to some little extent), but the *spherical aberration* is better corrected: hence the lens will, as you have found, be deficient in what is called *depth of focus*. We regard this deficiency! as a positive advantage. Depth of focus with a large aperture is all nonsense. If you require this quality, obtain it by contracting the aperture. A good lens will even then work as quickly as one with a large aperture, possessing the so-called depth of focus.

Received.—Archd. Burns: Due notice in our next.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 105, Vol. VI.—NOVEMBER 1, 1859.

It certainly does appear to be a most extraordinary circumstance that M. Niepce de St. Victor should again have discovered a very ingenious ACTINOMETER that was very unreasonably originally contrived by Mr. Burnett, and published in our pages something like *ten months back*. The letter of our Paris correspondent, which we published in our last number, contains a description of the learned Frenchman's new (?) arrangement: will our readers kindly re-peruse the same, and then refer back to the number published on 15th December, 1858, page 319, where they will find precisely the same idea, not merely as a crude suggestion, but even more elaborately worked out by Mr. Burnett than M. St. Victor appears to have thought necessary.

Now that this subject appears to be drawing more and more attention—and deservedly so, for it is one of vast importance—and that the paper alluded to was published in our last volume, since which time the number of our readers has very greatly increased, we may be excused for reproducing that part of the paper which more immediately bears upon the point in question: we therefore give it *verbatim*,

Professor Draper, in America, has already recorded very interesting observations on the variation in spectral position of the erythroactinic influence; but we want continuous and connected series, such as can only be obtained by the employment of a set of *self-registering* apparatus in every public observatory, and in every other locality wherever an honest and not absolutely stupid person (for the attention required would be of the simplest kind) can be got to look after it.

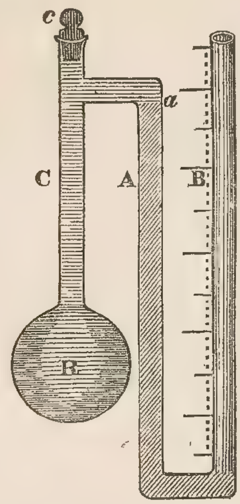
Where sensitive *paper* is used, either by itself for the registry of the strength of cyano-actinism, or as the means of recording the indications of thermometers (either of the ordinary kind or electrothermic), or of recording the indications of fluid actinometers, the uranic and ferric papers offer considerable advantages from the length of time during which they retain their sensitiveness unimpaired, much greater than that of similarly sensitive argentine papers.

In the fluid actinometers, the solutions of uranic-oxalate, ferric-oxalate, and the mixture spoken of by Mr. Fowler, at the late meeting of the British Association, and many others,* might be employed, but the *measurement ought to be made by aid of a column of mercury* connected with the bulb or other reservoir of the sensitive fluid, thus—The tube A should be filled with mercury to the point *a*, when we commence, the mercury being poured on at the upper end of the tube B, and forced back by a rod and piston made to fit it. The sensitive fluid, oxalate of uranic oxide or other, is then introduced (of measured strength) at a small opening left at Cc, and when it has filled the space left vacant by the mercury, a glass or gutta percha stopper is placed in and closes the opening. It may probably be found advisable to fill only the reservoir R, or part of it, and to leave the air in the tube C. This tube C may be of any length, and twisted in any direction for our convenience in placing the reservoir. The tube may be protected from the light by paint or red paper, and we may regulate the action, by leaving as much or as little of the surface of the reservoir uncovered as we find to be convenient.

For registering by this apparatus a sheet of sensitive paper, of the same length as the tube *b*, is made to roll off regularly so as to pass behind it, all the surface of the paper being covered up *except where it passes behind a narrow slit which is exactly closed by the tube B*. The light will thus obviously register the height of the mercury at each instant of the day on this sheet, and the diagonal line, which a uniform actinism ought to describe on the sheet, whether a straight or a curved one, in consequence of the diminution of the quantity of decomposable chemical in solution as it becomes gradually exhausted, being once ascertained, any deviation from it, upwards or downwards, will at once indicate, and be the measure of corresponding difference in actinic intensity.

* I do not say that those would all furnish the same standard however adjusted as to relative strength of solutions, different chemicals being affected in different proportions by different parts of the spectrum; though in the case of the uranic and ferric salts, the oxygen being probably the body allotropized in both, it is not improbable that the proportionate relation to different parts of the spectrum might be found to be identical. But if we find different sensitives differently affected, this only enlarges the field of observation, and offers the opportunity for the collection of *additional* and *most valuable data*.

I need hardly mention, as it must be sufficiently evident to any one possessing the slightest acquaintance with the principles of physics, that the tubes A and B must occupy a *horizontal position, side by side*, and not an upright one, when the actinometer is at work, otherwise the increasing pressure of the column of mercury forced into the tube B would make the indications given on the scale, by equal disengagements of gas, become gradually less and less.



The rough sketch is intended to give the principle only, not the form, and I have given only one mode of employing it. Another would be, to have a large number of them ready filled and in order, and then, by machinery or by hand, uncover one—say every hour, or every half hour, or ten minutes, during the day, and then record the rise of the mercury during a given fixed period of its exposure. All this may be done and registered by machinery; and it is very desirable that we should have similar registers, placed both in undecomposed sunshine, in diffused light, and in different parts of the spectrum, either prism-refracted or transmitted by different permeable media.

It will be at once seen from the preceding, not only that *oxalate of uranium* has been already employed for measuring the actinic force by confinement in a flask, but that a convenient special apparatus has also been contrived, by which the question proposed by our Paris correspondent, viz., "whether the proportion between the disengagement of the gas and the chemical intensity is perfectly established?" can be readily put to the test. We have sent him a copy of our former number. We shall be curious to know by what piece of ingenuity he will endeavour to extricate his compatriot from the dilemma in which he has placed him.

It has just occurred to us that the Abbé Moigno brought forward the same experiments at the British Association Meeting, and on reference to our report we find that such is the case, though the circumstance did not strike us at the time we were correcting the proof.

A Correspondent once accused us of "fulminating anathemas;" we have one to iterate upon the present occasion, called forth by an abuse of the patent nuisance. In the last number of the

Journal of the Photographic Society, at page 57, may be found a *Description of the New Patent Stereoscope*, the name of the author or patentee being prudently withheld — a precaution at which we certainly rejoice, inasmuch as we can make our comments undeterred by any fear of being guilty of offensive personalities.

Some ingenious gentleman appears to have discovered that many architectural subjects must be taken by "cocking up" the camera, or not taken at all; and that, when so treated, lines that should be parallel are rendered converging. In order to render such stereographs available without the observer being annoyed by the distortion, the same ingenious patentee has made the novel (!) discovery that they should be viewed in the stereoscope in a position *inclined to the observer*. Had he contented himself with announcing his discovery (!) no one would have cared about the matter — everybody is not bound to know even the most simple facts; but when such an one is foolish enough to waste his money in taking out letters patent for a stereoscope that shall permit of the stereographs being presented to the eye in an inclined position, he is not likely to meet with much sympathy for the loss of his money at all events. Our readers may think we are joking: we quote the concluding words of the article.

"The patent includes the application of the above principles to the stereoscope in whatever manner the print may be presented to the eye in an inclined position."

M. CHAS. CHEVALLIER, the well-known French optician, has recently published a new edition of his *Manual of Photography*, in which there is a passage that struck us as exquisitely comical. After describing the *modus operandi* adopted by a Russian photographer in practising the collodion process—the description appearing in the form of a letter from the Russian nobleman, who states that he has frequently operated at a temperature of 48° Reaumur (about 140° Fahr.) — the editor remarks: — "This observation is not without interest, demonstrating as it does *that collodion may be employed in hot countries*." The *naïveté* of this announcement is certainly amusing, after the experience of Roger Fenton and Robertson in the Crimea, and Frank Frith in Egypt and Nubia. We have heard Mr. Fenton state that in the Crimea the heat was at times so great that a funnel of gutta percha which he kept in his photographic van became so soft as to *slip through the hole* in a piece of wood in which it was usually kept; and when Mr. Frith was in Egypt, it was not an uncommon thing for the *collodion to boil* when poured upon the glass plate.

THE last number of the Journal of the Photographic Society contains a communication of some interest from the Rev. T. M. Raven, one of the prize-winners at the last exhibition of photography held in Edinburgh, under the auspices of the Photographic Society of Scotland. While printing some proofs in *bright* and *warm* weather, a piece of cardboard being placed between the back of the pressure-frame and the sensitive paper, on one print being sufficiently exposed, which happened in a short space of time, he *immediately* changed the negative for another, placing also a fresh sheet of sensitive paper, and replacing the piece of cardboard as before. *On to the back of the sensitive paper was almost immediately transferred the impress of the negative that had been removed from the frame*, while the opposite side of the same sheet of paper was at the same time receiving an impression from the negative with which it was then in contact. This we remember was brought under notice at the meeting at Aberdeen by Professor George Wilson; but the report which we received of the fact was too vague and incomprehensible for us to notice in our impression of the 1st ultimo.

The rev. gentleman states that the "cardboard and sensitive papers were perfectly dry," and ventures a supposition that the effect is attributable to "the combined influence of heat with light." Now, without for one moment questioning the good faith of the statement relative to the *perfect dryness* of the paper, &c., we certainly doubt the correctness of the assertion in a strict sense; and for this reason, that it is not probable that any one would voluntarily employ paper *perfectly dry* for printing upon photographically, unless he had some special object in so doing, because it not only would entail additional trouble in bringing it to that condition, but would be highly inconvenient to operate with. Few persons but those who have tried the experiment are aware of the hygroscopic properties of paper, and would be astonished to find for how short a time paper *perfectly dry* will remain so. We have no doubt that the paper and cardboard were what is conventionally termed "dry;" but this is very far indeed from a total absence of moisture.

Under any circumstances the fact mentioned is interesting, but we do not consider that *light* plays any part in the phenomenon.

In the same communication already adverted to is another interesting point, which we quote as follows:—

> An experiment I have been making with sensitive paper for the waxed-paper process has struck me as curious, as I have been under the impression that the iodide of silver in the paper could be rendered soluble by immersing it in a rather strong solution of iodide of potassium. I prepared, a few days since, several sheets of paper for the camera which the weather prevented me from using; I immersed in a bath of iodide of potassium (12 grains to the ounce), and left them covered up, excluded from the light, for three or four days, after which I hung them up to dry in a very dark room; the following day I exposed pieces of these papers to light, when they gradually changed colour, and in the course of two or three hours became a dark brown.

This last is a circumstance at which we are by no means surprised. We find in the Fothergill or Taupenot processes that all the free nitrate of silver may be converted into an analogous salt of the chloride *without destroying the sensitiveness*, and this we believe to be owing to the fact that a combination between the organic matter and the nitrate of silver has been previously accomplished, which combination is not destroyed by the action of the chloride, and which also plays a part with regard thereto that is at other times performed by the free nitrate of silver. In the case of waxed-paper precisely the same conditions may be in force.

With regard to the solubility of the iodide of silver in a strong solution of iodide of potassium we have to remark, firstly, that one of twelve grains to the ounce of water would scarcely come under this category; and secondly, that if even a saturated solution had been employed, it would not have removed the *whole* of the iodide of silver, as the small quantity of solution remaining on or in the paper would itself have contained some of this salt, while any attempt to wash the paper in water would have only resulted in re-precipitating the iodide of silver, by weakening the strength of the iodide of potassium solution.

While we regard the record of this fact as equally interesting and useful with the preceding, we cannot assent to the notion of there being anything mysterious or inexplicable therein.

IN the communications with which we have recently been favoured by Dr. Maddox, it may be noticed that his original experiments commenced with *paraffine oil*, as a means of rendering the paper transparent, instead of employing the troublesome process of waxing, though subsequently he used it as a vehicle for dissolving vegetable and animal wax, as well as availing himself of other solvents for a similar purpose.

We remarked, in connection with the first or second paper, that the samples prepared with paraffine oil appeared more transparent than those treated with belmontine, which Dr. Maddox imagined to be the same material in a purer state. We also mentioned a fact in reference to the respective qualities of these two substances as combustible bodies which led us to infer that, though allied, they were certainly different. We are

fond of collecting scraps of information from all available sources, and here follows one that we have hit upon relative to one of the substances named.

An inquiry has recently been instituted into the source of an accidental fire that occurred lately in Bucklersbury, on the premises occupied by the Patent Paraffine Light Company.

Dr. Letheby deposed he had analysed a bottle of paraffine oil. On March 13 he received from Mr. Stuchbury a sample of paraffine oil, which he had submitted to examination. He found it to be oil obtained by the destruction of the bituminous coal or shale. It was lighter than water, and gave off vapour at various temperatures, causing a peculiar smell. The vapour was inflammable at 140 degrees, and burned freely from a wick, or open saucer, at 160 degrees; by distillation it yields a very volatile oil indeed, the proportion of which is about one-fifth of the whole liquid. It was this volatile oil that gave the odour to the paraffine oil, and was the cause of its inflammability at low temperature. The other portions of the oil were of a more fixed character, and did not inflame or give off vapour under a temperature of 300 degrees. The vapour of the light volatile oil, when mixed with air, formed a very explosive compound. Its vapours were very inflammable in warm weather, especially in summer; and from the oil *not drying* like ordinary spirits, *but remaining fixed* on any absorbent matter upon which it falls, it was very liable to combustion from the falling of a lighted match.

Dr. R. D. Thompson, lecturer on chemistry at St. Thomas's Hospital, deposed—This oil could not be set on fire by a lighted match at the usual temperature. He agreed with Dr. Letheby as to the temperature at which it would ignite. According to his experiments it would not give off an inflammable vapour at the temperature of the day. He found gin boil at 190. At a temperature between 80 or 85 it was inflammable. He found with paraffine he had to heat it up to 130 degrees before ignition. He had extracted six or seven oils from it, but not volatile. The volatile part was exceedingly small in comparison to the others.

We presume that it will be conceded from the evidence given that paraffine oil contains a large proportion that is *not volatile*. We have recently been using belmontine for artificial illumination, and have several times had some spilt upon carpets, &c., but without any apparent detriment, as the whole seems to evaporate readily. This fully accounts for the superior transparency of paper treated with paraffine oil, while at the same time it points to belmontine as being probably a better medium for use as a solvent of wax, while it is much less obnoxious on account of its scent; for though it partakes somewhat of the same kind of odour, it is not nearly so offensive.

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

It is not often that we experience a greater amount of pleasure in examining any number of stereographic productions than has fallen to our lot lately, in studying a series of a dozen with which we have been favoured by Mr. Archibald Burns, of Edinburgh. Not only are they "got up" in the best style, but the printing and general manipulation leave scarcely anything to be desired, while the subjects chosen and the points of view selected are eminently good. The negatives, we are informed, have been taken by the Fothergill process, and if regarded as specimens of its capabilites they must be admitted as incontestible evidence in its favour. The intensity combined with transparency of the deepest shadows, the integrity of the high lights, and the delicate gradation of tone, ranging over every possible variation between the two, are beyond all praise, and the samples before us illustrate most happily several points of considerable interest to those in search of a dry process for adoption. Specimens of architecture, crowds of dwellings, distant hills, rugged rocks, expansive prospects, are all delineated with the most accurate fidelity. In one point alone do we think there is much room for improvement, and that is not connected with either the process or the manipulation, but with the character of the sensitive film:—the foliage, though fully impressed, exhibiting every detail, is unproportionally dark in colour compared with the rest of the subject, rendering one or two of them a little sombre in aspect. We think that by the addition of a little bromide of some kind to the iodising material the slight drawback we have indicated would be obviated.

Having pronouced judgment upon them as a whole we now proceed to deal with them in detail, and first we notice two specimens illustrative of the

Architecture of Edinburgh, viz., the *ancient* and the *modern*, the first of course being the more picturesque and interesting, represents a very characteristic portion of the *Old Town*, the view being taken from a corner where two streets unite, and exhibiting a portion of both—the post of honour being occupied by R. Turner's woollen rag store, and a horse standing with a laden waggon in the foreground. The old houses, with their quaint gable ends and varied storeys, each one projecting beyond that underneath and piled upon one another like Pelion upon Ossa, convey a capital idea of the locality. We venture to predict much popularity for this slide, and would suggest as a companion picture a view of the old Tolbooth. The illustration of the *modern* architecture is a portion of a building (not named) in the Roman style. We fancy this is the entrance to the Post Office. Though not so interesting as the preceding one it is equally well executed, the utmost amount of detail being combined with breadth of effect. Although no figures are visible, a couple of trucks, one of them containing builders' materials, are so disposed in the foreground as to hint at the existence of active life: this is in our opinion a good stroke of policy.

Holyrood Palace—A general view, taken as we judge from somewhere near the Calton Hill, is very effective. The palace itself, the ruined chapel, and the formal garden in the foreground, are backed up by a portion of Salisbury Crags, with Arthur's Seat towering above the whole. It gives an excellent notion of the spot.

The Burns' Monument, near the Calton Hill, is taken with the same background as the preceding and is very effectively rendered, the point of view being happily chosen, and the beautifully transparent shadows very artistic and telling. As an illustration of the capabilities of the process employed in taking the negative this slide is a favourable example.

Melrose Abbey—Of these ruins (which by the way are in capital preservation) there are two slides, both well executed, the characteristic effect of the masonry being admirably preserved. These will be highly valued both by architects and antiquaries.

Elgin Cathedral is a highly picturesque ruin; the general view is taken from a position which allows full effect to be given to the appearance of desolation. This slide is beautifully executed and the subject interesting. A second slide, illustrative of the same locality, is scarcely to be surpassed, whether regarded as a stereograph, a picture, or a specimen of photography. It is a view of the principal entrance, a pointed arch with its many mouldings, casting those rich shadows for which the ancient Gothic style is unrivalled. It is pierced with double pointed doorways, through which the interior is visible. The crumbling carved work of the heavy mouldings, and the general state of dilapidation everywhere painfully visible, tells but too plainly that the "light of other days is faded." This subject would be a fine study for an artist.

Roslin Chapel is a fine specimen of ancient architecture in a state of preservation, and contrasts admirably with the preceding, although the antiquary and architect will delight in it equally. The artist may object that the vew is formal; and so it is, but for all that the slide is a *perfect gem:* as a stereograph it cannot be surpassed. In the centre is an open doorway, which shows the depth beyond in spite of gloom, while above, three windows are visible, in which the effect of the ancient *quarried* glass is rendered with a perfection absolutely unique. The windows on the further side of the building are seen through those in the front, but at the same time the light is reflected from the surfaces of the panes with a truthfulness that, by any other means than by the aid of photography, is utterly and thoroughly inimitable.

Inverness from the Royal Observatory is quite in a different style. The winding river, spanned by a suspension bridge, the clustering dwellings, with here and there a "heaven-directed spire," the "eternal hills," in the far-away distance, with a castle-like building in the immediate foreground, combine to form a very picturesque whole. There is one drawback to this otherwise fine slide: it shows signs of having been produced with very short exposure (for we notice a tiny figure on the river's bank, and indications of clouds in the sky), and there is an extra degree of sombreness in the few trees visible, some of which are located rather unfortunately near to the spectator. In spite of this defect, however, the slide is a capital one.

On the Island of Inchkeith a portion of the inhospitable shore is reproduced with startling fidelity. This is a wonderful example of the application of photography to the purpose of geological illustration. The curious rocks of laminated structure, heaped together in wild and picturesque confusion, are given with marvellous accuracy of detail—the waters of the ocean being just visble in the extreme left corner of the picture. It is curious, highly interesting, and beautiful.

Nameless is the designation of a slide that presents a puzzling aspect to the beholder until assisted by the stereoscope, when it

stands revealed as a mass of lichen-covered rocks that Hunt would rejoice in as a study for his magic pencil. The grotesque and weathered rocks, some clothed with moss and lichen, are mingled with various other productions of the vegetable kingdom — here a flower, there the deeply-serrated leaves of a graceful herbaceous plant are seen; a few straggling bare stems are balanced by some downy leaves of a felt-like smoothness, and in the foreground a plant of dandelion, with its feathery tuft of seed ready to be wafted in all directions. This last is the only weak point in the slide: owing to the delicate nature of the feathery adjunct it trembles in the gentlest breath of air, and thus, though perfectly recognisable, it presents a slightly thickened appearance, which certainly deteriorates a little from its beauty.

We have dwelt at considerable length on these finely-executed and charming specimens, for we are persuaded that it would be impossible for the most undemonstrative lover of the beautiful to behold them without expressing admiration. In advising our readers to procure copies for themselves, we feel that we are putting them in the way of obtaining a treat for which we shall earn their gratitude. We do not hesitate to affirm that the specimens before us would materially enhance the value of any collection of stereographs in existence.

TRUTH IN ART ILLUSTRATED BY PHOTOGRAPHY.

By H. L. Keens, Sen.

[Read at the Meeting of the South London Photographic Society, October 20, 1859.]

After defining his meaning in the use of such terms as "art, nature, pre-Raphaelism, and photography," Mr. Keens said :—

In a court of law we are required to speak "the truth, the whole truth, and nothing but the truth;" so also in the art of painting is the same quality in all its bearings rigidly required. We will therefore direct our particular attention to this point while we endeavour to elucidate it.

We will suppose, by way of example, that an artist passing through the streets of our densely populated city has his attention arrested by the sight of a decrepid old man, apparently sick, and suffering acutely from hunger and neglect, endeavouring by the aid of a stick to drag his wasted form to some place of public observation, in the fond hope that some merciful creature may relieve him.

A young and beautiful lady, who has just stepped from the door of her home in a more public thoroughfare, has her eye attracted and her heart touched by the sight of so much accumulated misery: she stops and hastens to succour him. Now the artist who can, by a few simple materials, develop on his canvas a faithful representation of this interesting scene *in all its truthfulness*, would be deservedly worthy of our warmest gratitude. We should not be satisfied to see the beggar represented with a fine pink complexion, white linen, and smooth hair. No, let it be truthful; let him be shown with his dirty sallow skin, his hollow sunken eye, grisly beard, and ragged clothes: in short, all that which would naturally have excited the compassion of the young lady.

Her dress also, whether silk or satin, must be faithfully depicted, and with no less care than her graceful form and beauteous face; but, above all, the angel of compassion must speak eloquently from her melting eye, her expressive lip, and glowing complexion. This will serve to illustrate our view of *truth in art*. Let us now proceed to the subject of pre-Raphaelism.

Most of the pictures painted some centuries previous to Raphael were religious, executed either for churches or private oratories. The subjects were frequently single figures, representing our Lord, the apostles, or some of their successors who had signalised themselves in ecclesiastical history. In most of these subjects there have been more or less of the traditional types which artists then copied: thus, for instance, the representations of Saints Peter and Paul even now used correspond with the description given by the historian Eusebius.

In order to convey the religious feeling which the artists themselves were in possession of, they had recourse to the study of that general placidity and composure which were more or less stamped on the countenances of the ascetic and recluse of their times; consequently, so far as regards the expression of the countenance, their productions were truthful, but in every other respect they were generally untruthful.

But artists were occasionally starting up from their fellows and aiming at some nearer resemblance to nature, thinking their art was not advancing to its true goal while nothing was attempted beyond the representation, or rather communication, of some thought which, although in itself grand, pathetic, or beautiful, was but imperfectly conveyed.

As the technicalities of painting became more understood, they saw with pain and dissatisfaction that the solemnity of the subject was destroyed by shocking departures from the realities of nature, as in some pictures by Fra Angelica, in which the heads are worthy the study of a modern master, while the bodies of the same figures would excite the ridicule of the youngest tyro in the academy.

Nature *then* became the entire and exclusive study of the artist; and although it is to be lamented that the mind was so exclusively directed to a close imitation of the object as sometimes to commit itself to subjects unworthy of the pencil, while the noble and instructive themes of history or religion were laid aside; still it is satisfactory to know, that on the walls of the Vatican, Raphael portrayed forms and expressions (with some degree of excellence in colour and *chiaroscuro*) which satisfy the most critical, speaking to the heart and understanding of millions of the unlettered more powerfully than the most eloquent oration, and to the learned afford subject of reflection, developing new charms on every fresh inspection, like the oft-read poem, ever living, ever new. *And thus did truth in art extinguish pre-Raphaelism.*

Now let us imagine a traveller, who on entering a forest, finds several pathways before him, he feels utterly at a loss to know which will lead him to his place of destination, and he has reason to fear the terrible dangers attendant on the approaching night; a Will-o'-the-Wisp too has just risen, which will assuredly lead him into some marsh or bog, and no friend is near to direct his steps. Such was the position of the human mind in this country with regard to Art not many years ago; uncertain what course of study to pursue; at a loss to know whether Nature should be imitated, or the conventionalisms of fashion and fancy. One class of artists proposed the study of the Antique, another, that termed the Ideal, a third the indiscriminating imitation of Nature, while others chose a close adherence to this or that favourite master of some peculiar school or age. So unsettled was the mind of some patrons, owing to the conflicting styles and theories, that, from our own experience, many artists lost their commissions or employment. Pre-Raphaelism seemed to be the Will-o'-the-Wisp that had led astray art producers, art critics, and art patrons; when, like an angel from heaven to the benighted traveller, Photography appeared, and with a soft whisper pointed out the path which would lead us to that perfection in art we desired. To show this will be our object in the remaining portion of this paper. We shall consider it under three points:—first as to outline, second as to light and shade, third as to texture.

First, as to outline—The outlines in a good photograph are so true, that they will alone convey the most striking likensss of a face, with the precise expression of the sitter. Let an artist take a very light photographic print, and strengthen very carefully the outlines only, he will be surprised at the result. How many artists attempting to draw a face in outline, and finding themslves unequal to the task, have thrown aside the crayon and taken up the brush, hoping to succeed with shade and colour, and thus prodnced, in too many instances, an amalgamation of errors, which but scarcely pleased the ignorant and greatly disgusted the more informed. Observe the outlines in cloth drapery, how elegantly each line curves!—no disagreeable angles—no formal stiffness—all is ease and freedom. In the foreshortenings the folds appear multiplied, and to press upon each other, yet every line is clear, nothing confused, and each division and intersection worthy of study and imitation. In silk the crispness of the material breaks the lines by repeated cross-curtings and intersections; yet, notwithstanding, every break is but an introduction of smaller curves equally beautiful.

Light and shade — or, as we artists term it, *chiaroscuro* — is seen in perfection in a good photograph, whether we refer to its parts or to the whole. Observe the shadow under the nose: it is not an opaque patch of black, but an imperceptible gradation from the deep markings of the nostrils to the half-tint in which it becomes lost, showing the powerful effect of reflected light, which is also very manifest under the brows, on the lower part of the chin, nose, &c., and in general on the shadowed side of the face; but we must particularly admire the gentle gradation from the high lights to the half-tints, and thence again into the shade, until all is lost in the deepest recesses, and that so imperceptibly that there appears to be no shadow, and yet all is in full relief.

The old masters were delighted to study nature as reflected in a mirror, and learn thereby to imitate its mimicry; but could they have seen a photograph, an image fixed, that can be analysed, examined and studied, not like that in the mirror, fleeting and changeful as Nature herself, they would have been far more delighted, and as ready to profit by its suggestions as they did from those of the mirror.

How different from a good photograph are those disagreeable patches of light and colour, called pictures, which have of late so frequently disgraced the walls of our Exhibition, in which each object appears to be cut out of pasteboard and pasted on the canvas, not unlike some of those old drawings occasionally to be met with, representing playing-cards laid flat, and partially covering each other! No wonder that foreigners should have smiled with contemptuous surprise at such foolish productions.

Landscapes are beautifully portrayed by the photographic art; there is no mistaking distance in its productions although unaided by colour. Each tree in an avenue recedes from the nearer one; first, second, and third distances keep their respective places, until the extreme distance is lost in atmosphere, while the detail of the foreground is wondrous with leaf, moss, and bark in perfection. Unlike pictures of the new school, no distant hill or dark cloud in the horizon is ever there seen attaching itself to the head of some miserable figure in the foreground.

We should conclude with a few words on the subject of Texture, but that it is superfluous. Let any one examine carefully a good photograph, all is perfection — flesh, hair, silk, satin, velvet, cloth, lace, in a word, the exact texture of every object in nature, nay, it is — *Nature itself.*

> And who can paint like Nature?
> Can imagination boast such varied hues?
> And can she mix and blend them with such skill,
> And lose them in each other?

REPORT ON THE EFFECT OF CITRATE AND ARSENITE OF SODA WITH REFERENCE TO COLLODIO-ALBUMENISED PLATES.

By Alfred Rosling.

I have now tried the keeping properties of Taupenot's plates, as follows: — 1st, plain; 2nd, treated with a citrate of soda bath; 3rd, with an arsenite of soda bath, say to the extent of twenty-five days.

That is, on the 26th ultimo I excited six plates (stereoscopic) which had been previously prepared exactly alike: two plates excited as usual, two plates immersed, after exciting and washing in a bath (two grains to the ounce of rain water) of citrate of soda, and two plates in one of arsenite of soda, and again washing after the last two baths.

On Saturday the 22nd instant I exposed the said six plates. Those treated with the citrate of soda appeared *as good as fresh excited plates.* Those not treated with any bath, after exciting, showed a little decomposition around the edges of the plate; and those treated with the arsenite of soda were too far gone to make a perfect picture to the edges.

It appears to me that there is a small advantage in using a citrate of soda bath, and a decided disadvantage in using the arsenite. I am now speaking from the result of this experiment. A good deal depends, as it would seem from certain circumstances, upon the state of the collodion, possibly, as I have in some of my experiments thought the citrate bath gave a more decided advantage than I have found in my last.

Either in your Journal or in a communication somewhere, you stated that you still thought that the citrate bath after the exciting bath increased the sensitiveness, by enabling you to keep the development up longer without decomposition taking place. I have tried a much weaker developer than I usually make use of, and then I could develop two plates with the same portion of developer without decomposition having taken place to an injurious degree.

The difficulty I experience is in obtaining full definition in dark trees in shadow, without a long exposure, where light objects are also in the picture. To illustrate my theory, or what I really find in practice, I state that where, with sunshine on one side of a street and the other in shadow, I should give a considerably longer time than if the street were wholly in shadow, because in the last case I can continue the development further than in the former.

A stone house without trees — my own for instance — I could get sufficiently exposed in two minutes; but if I take trees in I should give six minutes.

At two minutes' exposure, before I could get the definition out with the tree, sthe house would be as impenetrable to the rays of light as a gutta percha tray.

If you can point out any iodiser which will attack vegetation without over-doing the high lights it would be a great desideratum.

Having heard so much in favour of the Fothergill process I have been induced to invest sixpence in Keens' book. I confess I am not enamoured with the process, having tried it several times, and produced results only similar to specimens obtained by other manipulators which I think inferior to those by Taupenot's process. I do not intend to proceed further with the process at present; but if at our next exhibition Fothergill's process carries the palm, I shall probably go into it in good earnest.

[We have no doubt that the addition of more bromide of some kind to the collodion would enable foliage to be taken with the same exposure as light-coloured objects. The paper by Mr. Heisch, published in our last volume, pp. 135 - 138, proves this very clearly. By using one part of the following iodiser to three parts of plain collodion he was enabled to obtain a *correct* impression in light and shade of *red* and *white* camelias, with *green* leaves and the meshes of a yellowish basket.

IODISER.

Iodide of ammonium	36 grains.
Bromide of ditto	12 "
Chloride of calcium	3½ "
Absolute alcohol	2 oz.

— Ed.]

PRACTICAL HINTS UPON POSITIVE PRINTING.

By Mr. Leake, Jun.

[Read at the Meeting of the South London Photographic Society, October 20, 1859.]

Mr. Leake prefaced his paper by remarking, that as it was intended solely for beginners, the gentlemen present must not expect an elaborate paper upon the theory of positive printing. He merely intended to offer a few hints which he thought might be useful at a time like the present, when most amateurs having returned from their photographic tours loaded with negatives, were anxiously considering how they might produce from them the best positive prints. To assist them in the accomplishment of their purpose, he proffered the results of his own practical experience in the following words: —

I think that to produce good and permanent prints will put all the good qualities of the operator to the test, and consequently the notion that to print a positive is the easiest thing in the world had better be at once scouted, and the idea that it will require all the care of which the operator is master be at once substituted.

I shall first notice the paper — I always use Saxony if procurable, if not I prefer Canson's. I like it of medium thickness; as I find if too thin the prints are deficient in vigour, and if too thick it is, when albumenised, very difficult to tone. As a rule the thick will give the richest print. I suppose nearly all amateurs procure their paper ready albumenised: this is the best and cheapest plan, if a small quantity only be required; the only precaution necessary being to procure it of a good maker, as an inferior paper is dear at any price, leading as it does only to disappointment and disgust.

We next notice the albumenising and salting — Enough albumen should be used to give a fair gloss, but it must be borne in mind that it is not used merely to give a glaze, but to impart a vigour and richness to the prints which cannot be obtained by any other means. I think too much albumen gives an amount of gloss which destroys the artistic effect of the proof, and no doubt retards the toning to a great degree. If, however, it can be toned without sulphuration, the resulting pictures will be of a very rich deep tone. If, on the other hand, too small a quantity be used, the pictures will tone more rapidly, but will be wanting in richness and depth, and will approach in effect prints on plain paper. In selecting a sample of albumenised paper, it will be remembered that it is not always that with the highest polish which contains the most albumen or gives the finest results, as some varieties are glazed by hot-pressing or some other method: this will soon show itself, as in the sensitising and subsequent process it will lose most of its surface. I prefer a paper with enough pure albumen to give a nice even surface without being too highly glazed. Owing to the difference in the sizing, &c., of various papers, the proportions necessary for this result can be determined only by experiment. As regards the salting when albumen is used, a less quantity will be required in solution than will be needed for plain paper, as the albumen will retain more of it on the surface. The quality and tone of the print is materially affected by the proportion of salt, a highly salted paper giving, with a proportionate quantity of silver in the sensitising bath, a richer and more brilliant print than one slightly salted. As I have not prepared any great quantity of albumenised paper myself, I cannot give any positive rules or formula for the process, but must refer the amateur to some of the many works treating of this subject. Albumenised paper cannot be used too fresh. I have no doubt that much of the trouble and

disappointment met with in positive printing is owing to the decomposition of the albumen. I once had a quantity of paper handed over for my use which, when laid on the silver bath for sensitising, left the albumen and salt floating in the solution — a disagreeable peculiarity, which I found attributable to this cause, the same bath giving perfect results with a fresh sample of paper of the same make. I think it a good plan to dry the paper gently at a distance from the fire if it seem at all damp, or if it be damp weather, immediately before placing it on the sensitising bath.

We now notice the sensitising process. — Albumenised paper should always be sensitised by floating. A hundred grains' solution is generally considered to be of sufficient strength, and no doubt is for some qualities of paper, while for others a much stronger bath will be necessary. Of course this will have to be regulated by, and adjusted to, the quantity of salt retained by the albumen; and it is much to be regretted that the manufacturers of albumenised paper do not as a rule specify the amount of salt used in its preparation. As the negatives from which I print are generally portraits, very soft without great intensity, I prefer a bath of from eighty to one hundred grains; this will give a very fine toned proof. At any rate the amount of nitrate should not be allowed to fall below sixty grains, except to print from a very hard negative.

It must be remembered that the colour of the prints is to a great extent affected by this cause — a weak bath giving a cold and faded appearance, while prints from a bath of full strength will, if from a good negative, be of a fine, deep, rich and warm tone.

You need not be afraid of having the silver bath too strong: it will weaken rapidly by use, and take a very large excess to spoil a print, though a slight deficiency will do so most effectually. Some operators recommend the addition of a small quantity of acetic acid to the sensitising bath: I consider this a most doubtful proceeding; in fact (it may be mere prejudice) I do not like acid in any part of the printing process, and always avoid it if possible. If the bath become alkaline by use, which may be known by its removing the albumen, enough acid should be added to neutralise but not acidify it. I generally keep a little kaolin at the bottom of the bottle in which the bath is kept; this keeps it a nice colour, and it *looks* cleaner if it is not. From three to five minutes will generally be found sufficiently long for floating; I think it should not be allowed a much longer time, as the solution penetrates the albumen and is absorbed by the paper, which it rapidly discolours. The paper should not be sensitised long before use if the finest results are desired, as it becomes yellow and the prints look cold when toned. I sensitise my paper the morning I intend to use it; dry gently at some distance from the fire, and place it in a folio between clean blotting paper for use.

The only precaution necessary in the exposure to light is to keep the paper in close contact with the negative. It will be found most negatives print better in the shade than in the direct rays of the sun. I sometimes think a little depth is gained by a short exposure to sunlight by way of finish. This, however, is mere supposition, and I give it for what it is worth.

We now come to the most critical and difficult part of the process, the fixing and toning. To perform this operation properly will require a great deal of care. The primary object most photographers seem to have in view is to produce black tones: black they will have by hook or by crook, and, unfortunately, whether *obtained by sulphur or gold.* The toning bath I would recommend for general use is the old one for fixing and toning in one operation, the formula for which is so well known that I need not repeat it, but will merely remark that very exact proportions are not essential. I have tried most of the new baths, but although some of them give very excellent results I think quite as good may be obtained, *with more certainty* and less trouble, by the old one. Upon removal from the printing frame the proof should be washed in common water till it ceases to flow milky, in order to remove the free nitrate. I consider this important, if *permanence* be desired, for two reasons: in the first place it prevents that sulphureting process which is invariably set up on the addition of nitrate of silver to the hyposulphite bath; and in the second it gives the alarm when the supply of gold begins to fall short, as the prints will then tone with great difficulty and slowness. The utmost care should be taken to prevent acidity of the bath, which may arise from various causes. In hot weather it will often become acid spontaneously, but more often from the chloride of gold containing free hydrochloric acid. To prevent as much as possible inconvenience from this cause, I use two toning baths on alternate days, and immediately after use replace the gold I consider to have been abstracted by the prints toned. By this method forty-eight hours are allowed to elapse between adding the gold and using the bath, thus giving time for the deposition of the sulphur and consequent neutralisation of the bath.* Some operators actually recommend the addition of a small quantity of acid to the toning bath. When this is done the bath assumes a milky appearance, and the prints being immersed in it pass rapidly to a very dark tone, though in all probability they are sulphuretted to a very high degree, and are *not permanent.* To remove any acidity which may arise I use a trace of ammonia, or, if preferred, a little chalk may be kept at the bottom of the bottle in which the bath is kept. The exact quantity of gold used has not I believe been accurately determined, but I do not think more than two prints 10 × 8 can be properly treated by each grain, and if very fine tones be desired a larger quantity may be used. To keep up the fixing power of the bath I keep a few crystals of hyposulphite at the bottom of the bottle. If this be done no further fixing of the proof will be required. It is better not to use a toning bath too long, as it will, notwithstanding every precaution, acquire toning properties, even in the absence of gold, and the accumulation of organic matter will render its use dangerous. I would recommend that the toning process be conducted as soon after exposure as possible, as the paper rapidly discolours; if, however, placed in a dish of clean water they will keep some time without much injury.

In toning albumenised prints it should be remembered that *the natural colour of the photographic image on albumen is pale red,* and that in consequence it will require a more energetic toning bath to produce black tones on *it* than on plain salted paper, and also that a very prolonged immersion in the bath is favourable to sulphuration, yellowness of the whites, and subsequent fading. I think it preferable, therefore, to be content with some of the beautiful tints to be obtained by the process before the black tones are reached, and so insure to a great extent their permanence.

Upon removal from the toning bath the proofs should be well rinsed in cold water; this process should be often repeated, as it is essential to remove the hypo as quickly and thoroughly as possible. To effect this the prints should be placed in a dish of water and turned over several times; the dish then being emptied a fresh quantity of water should be taken, and the same process repeated. They may then be placed in a large vessel, and a stream of water allowed to pass through for some hours, the water being poured entirely off several times. The water should not be turned on and the prints left to take care of themselves, but they should be frequently turned over and separated so as to insure *each picture* a thorough washing. I consider a prolonged soaking quite unnecessary, from twelve to sixteen hours being ample. Some operators recommend washing in hot water by way of finishing the process; but if proper care be taken with the cold, I think this will not be required. When properly washed the proofs may be dried at a moderate distance from the fire, ironed between sheets of blotting paper, and they will be ready for mounting. For this purpose I use a very strong solution of gum, taking care to use it freshly mixed. The prints are much improved by hot-pressing after mounting, and as it is a very cheap process I would recommend it for general adoption.

To recapitulate — I consider that in order to produce the best results by this method of positive printing, the following conditions are necessary: — The paper should be of moderate thickness, and retain a fair proportion of albumen and salt on its surface. The *exciting* bath neutral, and of full strength. The free nitrate should be removed before immersion in the toning bath. The toning bath should be kept neutral, and the supply of gold well maintained. The proofs should be well rinsed immediately on removal from the toning bath; and the operations of sensitising, exposing, and toning, performed if possible, on the same day.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. VIII.

I RETURNED to Jerusalem four days ago, for it seems impossible to tear one's self away from this hallowed spot, and I linger and linger, even while I know that the longer I stay the less inclined I shall become to depart.

The morning had scarcely broke over the high eastern hills, when a terrible hubbub among my followers startled me from my sleep. No matter how confused one's ideas are in being suddenly aroused from sleep, the instinct of self-preservation is always paramount. I seized a pair of revolvers, and without waiting to dress ran out to seek the cause of the disturbance.

* See Hardwich, page 166 (Fifth Edition), and page 162.

I have, I think, told you how John had got into trouble with some of the Pasha's soldiers, and in his summary way had pitched one of them down a vault. Out of that little episode the present adventure was born.

Three of the resident Pasha's officers with a dozen soldiers had seized on Hassan and his men, on my cook, and in fact on all my retinue they could lay hands upon. Me, you know they could not arrest, for in Turkish countries Franks are protected against it, except by their own consuls or consular agents. It was in vain for the soldier whom John had assaulted to make any complaint against my friend; but he could reach us through our servants, and the lying knave had complained of them as accessories to the assault. Hence the present hubbub. I have no doubt in my own mind that the guard had told the truth, but this arrest was an invention of an officer of the Pasha's, whose skill at extracting *backsheesh* out of travellers is well known. The plot had been hatched out during our absence. I was not precisely in the dress to appear dignified as I emerged from the tent among my captive followers; but clothing is a small matter in the East, and to an Oriental, accustomed to the various dresses of Arabs, sheiks, dervishes, and holy men, I suppose I presented as impressive an appearance in fluttering linen as I should have done in coat and trowsers.

I heard John's stentorian voice,

"Who are you? and what are you about?"

When you have heard seven Arab voices running over all the keys of the East—and there are several more octaves than you ever dreamed of—you will have some approximation of the confusion of tongues at Babel.

An insolent reply from the officer was all John got to his question, and I can scarcely venture to guess what would have followed but for my appearance with the revolvers. A significant pause ensued, for a pious horror of Frankish weapons possesses the Arab soul; and of late years the idea has gained ground that a Frank does not much care who, what, or why he shoots—from which idea, carefully maintained by those whose duty it is to maintain it, much good to the traveller may result.

"God is great! If the Effendi will listen ———"

"I will listen to nothing! Let go your hold of Mustapha Achmed Barikat! How dare you touch my cook—son of a starved hound!—when the breakfast is but half ready? Do you not know the penalty of interrupting an Englishman at his breakfast?"

A contiuous thunder of abuse brought the unlucky officer to his senses and his hand to his forehead, while he politely begged permission to execute his orders, which were to bring our attendants before the Pasha, who held court on the site of Pilate's house, within St. Stephen's gate. We yielded them all except our cook and one man, who served breakfast as rapidly as possible, and then followed us to the court of this high and mighty Pasha, of more or less tails, I dont yet know how many.

As we were entering the gate of the city we met our American friends coming out. They turned round with us, so that we made a respectable cavalcade with our horses, mules, and donkeys, as we entered the door-way of the House of Judgment.

His excellency was comforting himself with a *shee shee* (or water pipe) and the converse of a friend. As our party entered I did not at first recognise his companion, but the next moment I was in the arms of Mohammed Bey, who, I supposed, had returned to Damascus more than a week ago.

He presented me to the Pasha with infinite respect, and our business was despatched in an instant. The wily officer who had planned the attack was frightened out of his senses, and, by the way, he put down his feet as he walked. I could see that the leathern thong was in his soul: in fact, this high and distinguished governor begged to be permitted to evince his affection for his friend and the friend of Mohammed Bey by whipping somebody then and there. Of course we politely declined the favour. But the Pasha was not easily satisfied. He proffered various services; and if he could have identified the soldier who had dared to call a respectable traveller "Christian dog!" I verily believe he would have laid violent hands upon him, and buried him alive in the pit into which friend John threw him.

Business ended, we talked awhile, and then ascended to the top of the house, and looked at the sacred enclosure from that commanding position. We remained up there half-an-hour. I reserve a description of it for another letter, since I have an engagement with Sheik Mohammed, the principal sheik of the mosque, to visit the interior some day, and thoroughly explore it.

When we came out of the Pasha's house we paused a little while just inside St. Stephen's Gate, to look down into that vast pit or pool, which is commonly called the Pool of Bethseda. I will not venture an opinion on what it really is. It is by some supposed to be the remains of the trench which guarded the north wall of the tower of Antonia, and the temple area. It is still the northern boundary of that space, and is overhung on the south by the high walls enclosing the Harem or sacred place. Two arched vaults open in it, leading up under the Governor's residence; but these are quite choked up with stones and rubbish. It is at best, then, one of the mysterious relics of ancient Jerusalem, which we look upon with profound and melancholy interest. Around it stand tottering walls, and all the signs of desolation that sadden the Holy City. Minarets are standing pointing heavenward here and there near the lonely pool; but no angel descends to move the waters—no sick man finds healing in the flood—no Saviour approaches to bid the weak and weary sons of men rise up and walk.

A mysterious sadness grows upon me as I linger about Jerusalem. All is so mournful, so inexpressibly solemn. The very sunshine on these crumbling walls is unlike sunlight elsewhere and has no cheer, no gladness in its beams. I lingered all the morning within the gate—clambered into the dry basin of the pool—gathered some flowers from its sides—and listened like an old man while John and his friends talked, as it seemed to me, like children. And then we walked together down the hill into the valley; passed the tomb of the Virgin Mary, and the wall of the Garden of the Passion, till we came to the monolith, known as Absalom's Pillar. Here we sat down on the pile of stones that has accumulated around the monument—for every passer-by hurls a stone at the monument of the disobedient son—and the sun travelled westward. When shall the succession of morning, noon, and starlight over down-trodden Jerusalem have an end? When will God call Zion from desolation, and give to Salem the blessing of peace?

Are you not tired of my notes from this sad city? There is nothing to write about but ruin and its story, decay and its memorials. And yet I feel at times a pride—a tenderness mingled with a majestic pride—as I look down from the side of Olivet on the City of the Great King, for I know that the Lord will build Jerusalem, and I thank Him that my eyes have seen her even in her desolation. We may not live to see it, but the elders that carry the saint's prayers bear many vials full of those that beg the restoration of the sceptre of Judah; and the day cometh—the day will come!

D. T.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held at Myddleton Hall on the evening of Wednesday, the 26th ultimo, George Shadbolt, Esq., Vice-President, in the chair.

After the usual business of the meeting, reading and confirming the minutes, &c., had been disposed of, the Chairman handed round, for the inspection of the members, one of Messrs. Smith, Beck, and Beck's very beautiful mirror stereoscopes, and gave an elaborate description of the same. [An article on the Mirror Stereoscope is in type, and will appear in our next number].

In the absence of Dr. Ryley, who had promised to give the result of some further experiments on a modification of the collodio-albumen process, the meeting assumed a conversational character, and Mr. Hill informed the members that in a recent conversation with Mr. Fothergill on the process named after him, he, Mr. F., did not now limit the washing of the plate on its removal from the nitrate bath to a limited quantity of water only, but washed them in running water until all greasiness had disappeared.

Mr. M. S. Legg presented four well-executed proofs—pictures from negatives by the meta-gelatine process—for the folio of the Association, for which the thanks of the meeting were accorded to him.

Mr. D. W. Hill and Mr. Shave exhibited stereoscopic pictures from "Fothergill plates," and the Rev. J. Winter negatives on Taupenot's and Dr. Hill Norris's plates.

Mr. D. W. Hill also laid on the table two large pictures from Fothergill negatives—the first washing having been performed in a two-grain nitrate wash. Mr. Hill always pours on the albumen at the lower end of the plate after draining.

Mr. Gamham exhibited several pictures from Dr. H. Norris's plates.

Mr. Hare exhibited a portable elongating camera, adapted either for portraits or views. It was, when set up, perhaps the most rigid portable camera yet introduced. The body was made of velveteen.

The thanks of the meeting were voted to Mr. Hare.

The CHAIRMAN called the attention of the members to a dozen stereoscopic pictures of very high character, taken by Mr. Archibald Burns, of Edinburgh, with the Fothergill process. A very remarkable effect was produced in one of *Roslin Chapel* by the reflection of light ON the glass of the windows in front, and *through* the glass of windows in another part of the building. They were pronounced to be highly satisfactory by the most exacting of critics. [For description of these see page 267].

Dr. RYLEY having arrived, he recapitulated the particulars of his experiments described at page 137, vol. vi. of *The Photographic Journal*, and page 181, vol. ii. of *The Liverpool and Manchester Photographic Journal*. The further alleged discovery he had now made was, that by pouring a solution of gallic acid on the plate after washing the sensitiveness of the plate was restored, its keeping qualities insured, and solarisation prevented.

Mr. D. W. HILL reminded Dr. Ryley that there was no novelty in his discovery: it was identical with that described by Major Russell.

Mr. HISLOP said the only difference in the process was in using cold water instead of hot.

After a little wandering from the subject, Dr. RYLEY asserted it was simply impossible to take a picture by the Fothergill process as described by the originator in his letter to *The Times*.

Mr. SHAVE and also Mr. BINGHAM called Dr. Ryley's attention to the *fact of their having exhibited negatives by that process, and prints from them*, at the meeting of the Association held within a few days of the publication of Mr. Fothergill s letter.

A vote of thanks was given to Dr. Ryley; and on a further discussion ensuing, Mr. LEGG asked Dr. Ryley (who contended that the sensibility was owing to the alteration of the structural condition of the film consequent upon coagulation of the albumen) if he had examined the film under the microscope, and whether the result of his examination led him to the solution of the question, "whether the alteration was chemical or mechanical?"

Dr. RYLEY was not prepared to answer that question.

Mr. HANNAFORD thought that collodion sensitised with a simple iodide was not so sensitive after washing as if a bromide or other salt were added to the sensitiser, and that, with iodide and *some other* silver salt, free nitrate was not necessary to render the plate sensitive.

The CHAIRMAN agreed that this was an opinion worthy of attention, as it was well known that in presence of free iodine any other salt of silver would be converted into an iodide; and it was not improbable that the presence of iodide of silver in a nascent state might be the key to the sensitive condition.

Mr. WHARTON SIMPSON promised to read a paper at the next meeting *On the Positive Collodion Process, with some remarks on the Alabastrine Process.*

The meeting then adjournod until the 30th instant.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE first meeting after the vacation was held at the Lecture Hall, Carter Street, Walworth, on the evening of Thursday, the 20th ultimo.

The Rev. F. F. STATHAM in the Chair.

The CHAIRMAN called attention to the proceedings of the evening, prefacing his notice with some few remarks relative to his election as President, an office he had been induced to accept, not because he had any *practical* knowledge of photography, but solely from his ardent love of science, and especial admiration for the photographic art. He trusted that he should perform the duties of his office to the satisfaction of the members.

Mr. A. H. WALL, Honorary-Secretary to the Society, next addressed the meeting as follows:—

Mr. Chairman and gentlemen, this being in point of fact the first meeting of the "South London Photographic Society," devoted to its real business, I may perhaps be permitted to call attention to some few matters relative to its future purposes and existence.

The ultimate amount of utility and success which such a society as we represent may command, appears to me to be dependent upon the proper combination of certain elements, viz., photographic chemistry, photographic optics, photographic manipulation, mechanics as applied to photographic apparatus; and, although last not least, that knowledge of the leading principles of art, without which the learned chemist and talented optician, with all the manipulatory skill of a clever photographer, provided with the best apparatus, cannot produce effective or pleasing results.

Our President, the Rev. F. F. Statham, is a gentleman well-known for his chemical acquirements and scientific attainments generally, and I dare say, gentlemen, it is known to most of you that already one of the celebrities of the photographic world, Mr. Sutton, has announced publicly his obligations to this gentleman for his earliest knowledge of chemistry. Our Vice-President, Mr. W. Ackland, as a photographic experimentalist and the author of several works upon different branches of photographic art, is, of course, known to most of you. Mr. Shadbolt, I am proud to say, also one of our members, * * * * My friend, Mr. Noldwritt, a scholar of varied accomplishments, has watched the rise and progress of photography with no small interest and study, and beyond doubt is in possession of much information of an interesting and instructive nature. The name of Mr. Hannaford is familiar to you as one of our most talented amateur photographers.

Not to be tedious, I will briefly add that in Messrs. Leake, Sen., Leake, Jun., Cotton, Hook, Howard, Clarke, Hervé, Chapell, and others, we have practical or professional *photographers* of no mean ability; that in Messrs. Hervé, Keens, Rogers, Hannaford, and others, we have *artists* of professional repute or amateur skill; that in Messrs. Clarke, Leake, Sen., and Leake, Jun., we have, I believe, capital *mechanists*, and that in our Secretary we have a very "willing horse," but I fear one not sufficiently competent in the branches of knowledge more strictly and practically photographic. But now, gentlemen, having told you what we have, and congratulated you with good reason upon its possession, I want to conclude with a few words upon what we have not.

First, although we have perhaps as many or more members than we could reasonably expect, we have not enough. Members represent money; and although money is a very vulgar thing to allude to, it is no less the "sinews" of art and science than "of war." How to increase our members is therefore a question of primary importance. There is one way of doing this which I wish to point out (of course many other means of pursuing the same desirable object are in existence), and that is by the formation of a circulating collection of stereoscopic and photographic pictures for the benefit of members. This we may very speedily obtain if such of our members as possess stereoscopic and other negatives will generously present their society with copies of the same, and appeal to their photographic friends, *in the name of a society devoted to the advancement of photographic art and science, which, in common with every similar institution, has a just claim upon their kindly sympathy and support*, for contributions also. By so doing we offer attractions to those who, without being practical photographers themselves, would be glad to secure such an advantage, and by thus increasing the Society's funds, enable your Committee to organise and bring about fresh advantages for present members, and consequently further inducements for future members. I need not state that, as Secretary, I shall very gratefully acknowledge any such contributions that may be sent to me at 90, Cannon Street, West, City; I shall be also very glad to receive papers upon phographic subjects, to be read at our meetings, as also any correspondence relative to the exhibition of apparatus, &c., or names and addresses of such as may be desirous of being nominated and elected for membership.

The PRESIDENT having seconded Mr. Wall's appeal for the folio, and called attention to other objects connected with the Society,

Mr. H. L. KEENS, Sen., was then called upon to read his paper, entitled *Truth in Art Illustrated by Photography.* [See page 268.]

At the conclusion of Mr. Keens' paper, which was received with expressions of applause,

The PRESIDENT remarked that, beyond a doubt, the cause of art had been efficiently served by the introduction of photography, and that the spirit of improvement traceable in the productions of modern art was justly due to its influence, although the fact was not perhaps fully acknowledged just now. There were too many artists who still held the pernicious doctrine, that it was their high mission, not to copy, but *improve* upon nature, who had done more to lower and degrade their calling than could be briefly calculated. But that such was not the opinion of the great masters could be easily proved; for instance, among Raphael's celebrated drawings at Oxford, which when there he frequently and carefully studied, was a picture of the *Magi*, into which an elephant had been introduced, and he found that before Raphael painted that animal he made at least twenty careful drawings of it in various positions—not mere sketches, but finished productions, full of laboriously executed details, even the peculiar bosses and wrinkles of the skin and creases upon the trunk being scrupulously copied. If photography re-created this spirit of industry and patient care, and called modern art back to this *Raphaelism*, it would, he inferred, speedily extinguish the school called *pre-Raphaelite.*

Mr. Wall thought the picture of the *Charitable Girl and the Beggar* not only defined Mr. Keens' idea of "truth in art," but also its advantages. In a painting of this incident, without doubt, "the whole truth, and nothing but the truth," would best serve the highest aim of morality and religion, and consequently secure to the artist the highest and most valuable reward of art. There was nothing in the beggar to awaken interest in the breast of a romantic girl:—he was dirty and repulsive, and therefore it was the pure holy and christian feeling of charity alone which moved the young girl's melting heart and prompted her outstretched hand. Mr. Wall also agreed with the author of the paper in thinking that perfection of detail could in no way detract from the high purpose of such a picture; for, however truthful, and consequently beautiful, the imitation of silk or satin drapery might be, he should not envy the mind or heart of a spectator who found such things more attractive than that sweet expression emanating from the angel of compassion—an expression which was more frequently than any other seen upon the divine face of the great Saviour of mankind.

In such a scene an artist would find every quality he required—contrast, sentiment, loftiness of purpose, &c.—and the photographer nothing beyond the capabilities of his camera, if it were only possible, by the pistol or some other such arrangement, to obtain a picture without the cognisance of the principal actors. He would only add a few words to say, that while we decry bad painters, it should be remembered that we *sometimes* see bad photographs, as far below that of bad pictures. The speaker then concluded with some few remarks relative to the advantages photographers possessed in the existence of societies for the advancement of their art.

Mr. Keens said, the chairman's remarks reminded him of some observations made to himself by an Italian artist, painting at Hampton Court, who pointed out to him the extreme accuracy of detail presented by the cartoons, even in the representation of the fingers, the muscles of which were in their action almost as eloquent of the varied feelings as those of the faces—the upraised hand of the preacher, in *St. Paul Preaching*, contrasting finely with the almost paralysed appearance indicated by the drawing of the muscles in the hands, arms, &c., of the intently listening figures around.

Mr. Leake, Jun., then read a paper, entitled *Practical Hints upon Positive Printing*. [See Page 269.]

At the conclusion of the reading of the paper several beautiful specimens of photographic portraiture were handed round, as Mr. Leake's productions by the process he had described.

Thanks having been voted to Mr. Leake for his able and eminently practical paper,

The Chairman hoped to hear some remarks from the practical photographers before him. He would take that opportunity of impressing upon the gentlemen present the importance of carefully observing any thing unusual or accidental which might occur in their photographic practice. It was his belief that no science or art was so much indebted to accident for its discoveries and improvements as photography was. If every gentleman in whose experience a fact transpired for which he could not account would make a note of the same and bring it forward at these meetings, he had no doubt but they would form a most interesting collection, and lead by discussion to very valuable experiments and results.

Mr. Hannaford thought the subject of positive printing was a matter of vital importance, and that hints upon such a subject deserved their best thanks. In looking over our prints we all found a greater or smaller per centage of them faded; but whether or not photographs toned by the alkaline *gold* process would prove more uniformly permanent than those by the old process advocated by Mr. Leake must be left for time to decide; but are we sure that the old toning came from gold and not from sulphur? and as the prints remained but a short time in the fixing solution, it appeared to him that the advantages were decidedly in favour of the alkaline toning bath. He had tried Maxwell Lyte's process with the phosphate of soda with great success. Recently he had employed acetate of soda with gold. The advantage gained by it was, that over-exposed prints could be toned down very considerably, and on the addition of a small quantity of carbonate of soda the prints would continue to darken with but little further deduction.

He had made a great number of experiments in printing with the salts of various metals—iron, copper, cobalt, &c.—and exhibited a few specimens in iron. His only difficulty was in procuring pure whites; he was at present of opinion that none of these new processes stood any chance of superseding the use of silver, but they formed subjects for very interesting experiments, which probably might lead to some useful results. He hoped at a future time to read a paper upon this.

Mr. Howard stated that he must certainly agree with Mr. Hannaford in regard to the alkaline chloride of gold bath, as he had met with a deal of trouble by using the toning bath advocated by Mr. Leake, in the discolouration of his prints, which fact induced him to cease using it, since doing which he had never had any symptoms of fading, the whites being always good and pure. In the hands of professional printers no doubt good results were obtained by Mr. Leake's process; but he thought amateurs would derive greater satisfaction from the use of the other bath. He regretted that he was not chemist enough to advance any stronger arguments.

Mr. Hughes thought the old toning bath was theoretically defective. We never knew in using it whether the tone of our prints was really due to sulphur or gold; but in using the alkaline bath we were at least sure that sulphur had nothing to do with the toning. By its use also we could obtain any tone we pleased—chestnut-browns, purple-browns, purple-blacks, violet-blacks, and if there were any who desired such, cold inky-blacks. With regard to its economy, he knew by experiment that with one grain of gold he could tone five hundred square inches of albumenised paper, as he had proved by careful and repeated experiments.

Some prints were now examined, the peculiar mottled and yellow patchy appearance of which was attributed by Mr. Hughes to the use of a too weak solution of hyposulphite (or possibly from their not being exposed long enough to its influence).

The Chairman announced a paper on *The Difficulties of the Dry Process*, by Mr. W. Ackland, for the next meeting, on Thursday the 17th instant.

Mr. Hannaford promised a short paper, to be called *Photographic Jottings*, for the same evening.

The Secretary hoped he should be enabled to bring forward a fine collection of photographs for inspection on that occasion, and after a few concluding remarks relative to the advisability of reopening the discussion which had just ceased, called upon the meeting to proceed to the election of new members.

The following gentlemen were proposed and elected:—Messrs. Stevens, Armstrong, Luckin, Hughes, Hook, Ottley, Stevens, Wood, Chapel, and Keens. The business terminated with a cordial vote of thanks to the chairman.

LIVERPOOL PHOTOGRAPHIC CLUB.

The twelfth meeting was held at Mr. Keith's Rooms, on Tuesday, the 18th ultimo.

Mr. Glover exhibited an extremely curious print, representing the same face under eight different phases, commencing from a profile on the left side, and gradually turning until the full front, and ultimately the profile on the right side, became visible—the whole arranged in an uniform plane radiating from one common centre, so that if mounted on a card with a small hole above each print, in imitation of a toy with which many are familiar, would represent the head as continually turning. This was contributed by Mr. J. Dean, of Douglas, and excited much controversy as to the mode of its contrivance.

Mr. Keith laid before the meeting a very pleasing print of the whole of the military pensioners employed here as commissionaires. They were most artistically arranged, clustered in a pyramidal form round a nine pound gun, the topmost figure supporting the Queen's colours. The group had a most striking effect. It had been taken by desire of Colonel Falconer, for the purpose of being laid before Her Majesty; but Mr. Keith's philanthropic object was to make their cause better known, with a view to their being more generally employed, as their appearance had only been regarded with curiosity up to the present. He intended distributing copies to the press and public offices.

Mr. Bell called attention to a print he held in his hand, received from Mr. Shaw Smith, of Dublin, as the standard of excellence he required in those prints that were to be sent to him as exchanges—the prints that Mr. Bell had hitherto sent to him, though executed by some of our most proficient photographers, and regarded with very high favour by the members, and well known to fame by the world at large, not being deemed to possess adequate merit. The specimen was a view of the exhumed wonders of Petra; but, excepting the subject, it was inferior, red in tone, and not happily selected in an artistic point of view.

Mr. Bell also exhibited some of the new salt iodo-cyanide of potassium, concerning which a paper had been read by Dr. J. Milton Sanders before the American Photographical Society. The marvellous rapidity with which it removed stains and discolouration of silver excited great admiration.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of the members of this Association was held on Wednesday evening, the 12th ultimo, Mr. NICHOLSON, the Vice-President, in the chair.

The minutes of the last meeting having been read and confirmed, it was proposed by Mr. ROGERSON, and seconded by Mr. HOOPER, that Mr. Griffiths be admitted a member of the society. Carried.

Mr. HOOPER stated that he wished to postpone the paper he had promised for that evening, *On the Production of Large Waxed-Paper Negatives*, as he hoped against another meeting to be able to lay before them the results of some experiments he had been making with a paper prepared with albumen. He had not yet been able to try this paper in the camera, but judging of it from an exposure in the printing frame, he believed it would be found to be more sensitive than waxed-paper, and as the picture would be kept more on the surface, a clearer definition would be gained. Mr. Hooper then proceeded to develop several prints produced on each kind of paper:—those on albumen had only been exposed two minutes, and those on waxed-paper five minutes; the former appeared the more successful of the two.

Mr. RADCLIFFE exhibited an albumen frother, to be worked with a drill bow. The instrument appeared simple and effective.

A discussion on some minor subject followed, and a vote of thanks to the chairman concluded the business of the meeting.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

AT the last meeting of this Society, Mr. J. T. BROWN read a paper *On the Application of Photography to Art and Art Purposes, and more especially to Painting*. It was altogether of an introductory character, being mainly devoted to a history of painting, the periods when it flourished and declined, and the causes of decline. Seeing that art is so greatly dependent on the various chemical changes produced by colours, he considered all ought to aid in tracing the effects resulting from the different degrees of refrangibility of rays producing the solar spectrum, and by a careful analysis of their actinic action upon the many photographic agents within our reach, establish a series of data by which the artist should be enabled to distinguish the colour of the ray by which the change was produced. Photographers might then lay their craft more fully before the artist, who would more willingly avail himself of the power of arresting the pleasing variety of form with which he may meet amongst those ever-changing glories of the sea, the clouds, the fields, the lower animals, and man—and lay up a store of knowledge obtained at a moment when without such assistance it might be lost to him for ever.

By these means not only would photography be extended, but the art of painting would be benefited. The photographic image need not be servilely copied, but artists might adopt the course taken by Claude. "The country was his study, and the objects around him; and the effects produced by the varied illumination of morning, noon, and evening, were as guides which he obeyed or controlled as best suited his purpose—not imitating servilely what he saw, but employing it as the regulator of his taste."

Mr. Brown, in conclusion, dwelt on the connexion of pure colour with profound noble thought, quoting Ruskin's fine passage:—"If the blue were taken from the sky, the gold from the sunshine, the verdure from the leaves, the crimson from the blood (which is the life of man), the flush from the cheek, the darkness from the eye, and the radiance from the hair—if you could see for an instant white human creatures moving in a white world, you would soon feel what you owe to colour. The fact is, that of all God's gifts to the sight of man, colour is the holiest, the most divine, the most solemn."

No discussion followed the reading of this paper.

The third annual meeting of the Society was held on Tuesday evening last, at the Odd-Fellow's Hall. The chair was occupied by Mr. T. MORRIS, and there was a good attendance.

The Honorary Secretary, Mr. C. L. HAINES, read the following—

ANNUAL REPORT.

During the past year of your Society, which your annual meeting brings to a close, you have had several highly interesting and instructive papers read at your several meetings, and your Council can only regret that the poor attendance at several of them could hardly justify the trouble taken by the various gentlemen who kindly prepared them. Your Council therefore deem it their duty to again urge upon you the necessity, for the welfare of your Society, of a better and more regular monthly meeting. During the past session you have not only been favoured by papers from your own members, but also by many lengthy remarks by other gentlemen who have kindly undertaken the task for your edification and instruction; amongst others may be mentioned, Mr. Johnson and Mr. Woodward, the latter of whom is well known as the inventor of the solar camera, and who both exhibited his apparatus and also many beautiful prints taken thereby. It was intended by your Society to hold an exhibition at Aston Hall, in March last, but subsequently, on account of the apparent uncertainty as to the time of such exhibition, it was resolved to postpone it, at all events for the present year. Your library has been increased by the addition, during the past year, of several books, and your Council would remind the members that any book may be obtained on application to the secretary. Your album has not as yet had so many contributions to its pages as your Council could wish, and they would therefore again request the co-operation of all in contributing at least their mite towards this part of the Society's work. The funds in the hands of the treasurer are £7, 18s. 9d., which, together with £5, 15s. 6d., owing from members to the Society, makes a balance in favour of the Society of £13, 14s. 2d.

The only business remaining to be transacted was the election of officers for the ensuing year, and these were appointed as follows:—

President, Wm. Bagnall, Esq.; *Vice-Presidents*, Messrs. W. B. Osborn and C. L. Haines; *Treasurer*, Mr. J. T. Brown, Jun.; *Secretary*, Mr. E. W. Ball; *Council*, Messrs. T. Morris, Brittain, Dr. Hill Norris, W. Hart, A. Edwards, T. D. Clare, W. R. Holyoake, and Hunt.

On the motion of Mr. OSBORN, it was agreed to abolish the half-guinea entrance fee.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER V. *(continued)*.

COLOURING ON PAPER WITH DRY COLOURS.

I have never seen a pleasing effect produced upon paper by the use of dry colours, and it seems to me that these colours are as unfit for paper as oil colours are for collodion, in either case, however, both are used.

The albumenised paper is best, and before applying the colour it should be rubbed with very fine pumice-stone powder. The process of colouring has been already described.

ON THE TREATMENT OF IMPERFECTIONS.

There are certain defects to which the pictures of the best of operators are liable, in the shape of black and white spots and other markings. Various mixtures of water colours, opaque or transparent as may be necessary, are used to conceal these. For white spots, Indian ink with or without a little madder brown or sepia is best; for dark, white with a little Naples yellow, Indian ink, Venetian red, burnt sienna, &c. may be used, mixing two, three, or more colours to a tint which approximates most nearly to the tone of the photograph or colours of the part about the spot. If these spots are on the collodion they are best touched out *after varnishing*, inasmuch as this would so affect the water colours that however invisible the touches were when dry and dead on the collodion they would start prominently into sight under the varnishing, and defy all future attempts to conceal them. When the spots occur upon the flesh try the effect of your mixed tint upon the corner of the picture before applying it, remembering, if it be a black one, that the thickness of colour must give a surface just as opaque as that of the collodion.

It does sometimes occur that, owing to the greasiness of its surface, the lighted parts of the hair will be unpleasantly white, or in the eyes of some horror-struck sitter, GREY: a coat of Indian ink carefully applied with a somewhat dry brush and a very little gum-water will remedy this. Indian ink may also be used to strengthen the outline round the iris, when, owing to the milky blue of the sitter's eye, it is nearly or quite invisible, or from other causes lacks definition and sharpness.

UPON COLOURING HIGHLY.

The pictures best adapted for a process of colouring which resembles pastel paintings are large heads, and no colours are so well adapted for colouring highly as Messrs. Reeves's new "absorbent colours," working with perfect smoothness and evenness you will find them as pleasant to use as they are effective when used. It should be remembered, more especially with regard to highly finished work, that the best of dry colours are so slightly tenacious that the surface upon which they are applied cannot be too quickly secured under glass; with ordinary care, however, the colouring of

these pictures is tolerably permanent. Moisture will injure them, and they must not be exposed to strong sunlight, and of course much must depend upon the choice and preparation of your pigments in this as in every other branch of colouring.

With a few rules for the students guidance in finishing highly, I shall quit this branch of my instructions for the next, viz., water-colours.

To obtain brilliancy, increase the body of colour by repeated applications. See maxim 17.

For the retiring portions of your flesh, and to most of the finishing tints, add grey. See maxims 37, 41, 70.

In highly finished pictures colour the shadows, even the deepest, but only before varnishing. See maxims 42 and 43.

Keep the background near the head lower than the half tints, and lighter than the deeper shadows. See maxim 53.

Let your last touches be given with a *very light hand*, and let them be more definite and forcible in effect than their predecessors.

Select for this process such pictures as have strong shadows and well-defined half tints—an over-exposed picture being perfectly useless, inasmuch as the body of colour would soon bury the outlines beyond the chance of recovery.

Carefully preserve the purity of your tints in the highly lighted passages.

To finish highly requires no mean skill, great experience, and good artistic knowledge; and when all your difficulties are mastered in this branch, the effect obtained will never be so satisfactory as that to be secured in one-half the time by the use of either oil or water-colours.

The author of the preceding paper has, in order to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

A. S.—If you find the new colours adhere more easily to the alabastrine varnish than the preparatory solution, there is no reason on earth why you should not use it.

Annie.—The picture sent is coloured very carefully and cleanly; a little more brilliancy in the high lights is all that could be desired. I should not hesitate to offer you employment at my own establishment if we needed assistance in that branch. See an advertisement on page four of the last number, or make personal applications to *respectable* parties.

J. B.—Purchase the preceding numbers. I can assure you they contain no information that is not of absolute importance. Your picture is a photographic gem — quite an artistic production; but I cannot say much for the coloured one. Try water colours. I do *not* think you will ever improve a paper print with dry colours.

James.—Certainly not *very* promising, but, perhaps, not *much* worse than could be expected. Yes; I promise faithfully to inform you when I think your case is hopeless (why should I not?); but for the present *persevere*.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

Regulations of the Fourth Annal Exhibition.

The Fourth Annual Exhibition of the Society will be opened on the 16th December, 1859, and will be closed in February, 1860. All descriptions of photographs will be admissible. It is strongly recommended that each picture should be framed and glazed, with a margin of mounting board, not exceeding two and half inches in width all round. It is also recommended that in the case of pictures smaller than nine by seven inches, four should be in one frame; but a frame containing more than one picture must not exceed twelve square feet in area.

Each picture must have written distinctly on the back the name of the subject, the artist, and owner; the process (calotype, waxed-paper, turpentine-waxed-paper, albumen, the different varieties of of the collodion process, &c.), and if for sale, the price. Exhibitors are requested to be careful in specifying the particular process by which their pictures are taken, in order that it may be inserted in the catalogue.

Pictures touched by the brush will not be admissible unless so described.

A commission of 10 per cent will be charged on all sales made during the exhibition.

Two *Silver Medals* will be given for the best two pictures in the exhibition. One of them to be given for the best portrait or group, and the other for the best photograph of any other subject.

The *Maconochie Welwood Prize* of £10, to be competed for by professional members of the Society only, will be awarded for the best photograph, other than a single portrait. The same picture cannot be put in competition for the Maconochie Welwood Prize and for the Society's Silver Medal; and pictures in competition for any of the prizes must be untouched by the brush, and must be exhibited by the artist himself.

Works intended for exhibition must be delivered, carriage paid, at the Rooms, 90, George Street, Edinburgh, on 1st December next, after which none can be received. A list of the photographs sent must be enclosed in the case, and a duplicate list forwarded by post to the Honorary Secretary. At the close of the exhibition, the pictures will be carefully packed and returned, carriage paid, to the owners. C. G. H. KINNEAR,

49, *Northumberland Street*, Hon.-Sec.
Edinburgh, *Oct.* 1859.

Letters to a Young Photographer.

No. XXII.

My dear Eusebius,

The skilled artist is shown in his full appreciation of the relative value of *tones;* the unskilled painter fails because he attaches too much value to *hues*, and too little to tones. One of the most important things photography teaches us in the principles of art is this value of tones. I have already explained to you the meaning of this term, but it will not be amiss to repeat it, and to show why it is to be preferred to the terms usually substituted for it—*tints* and *shades*. Tone is equivalent to intensity, and is comparative. If you take Prussian blue and add white to it in increasing quantities, you will produce various *light tones* of blue; and in like manner, if you add black to the pure pigment, you obtain various *deep tones* of blue. These are usually called, respectively, *tints* and *shades;* but as these terms are often used to designate a change in colour or *hue*, it ensures more precision and less liability to error to employ the word *tones*. Moreover, there is an analogy in the use of the word in music: we say a loud tone or a low tone to express difference of intensity, the note remaining the same, neither graver nor sharper. The addition of black and of white to a pure pigment does not alter its *hue*, as the addition of another colour does, but only its intensity or *tone*.

Colour, in objects, possesses a value as tone which is independent of its tint as colour. This has to be taken into consideration by the engraver, who has to translate colour into tone; and when the subject is a picture by Turner or Diaz, you may imagine the extent of his difficulty.

Strange anomaly! Artists speak of *colour* where we can discover none; and where we see any quantity of bright colours they say—"this picture lacks colour." An engraving, or a drawing in monochrome, as sepia, bistre, or Indian ink, the artist will tell you is rich in colour! You look in vain for blues, reds, and greens. What he really means is that the subject is well executed in showing due regard to the relative value of tones. Thus, in *colour*, besides light and tint, there is another element—*tone*, or intensity. The painter imitates these three things at one and the same time; the photographer has to be content with light and tone, yet his works are rich in colour, in one accepted sense of that word.

But many colours, and still no colour! That sounds like a paradox, yet artists the most skilled in their art will so express themselves when the productions of a painter with no genius as a colourist are presented to them for criticism. The picture may be as lavishly enriched with the brightest yellows, blues, greens, purples, and reds, as any Turner ever painted, yet it lacks colour! It lacks the proper recognition on the part of the painter of the relative value of tones. Bright and gaudy it may be, but all the delicate appreciation of the power of *chiaroscuro* may be wanting, therefore it lacks colour, or rather, strictly speaking, tone.

Do not forget, my dear Eusebius, that whenever colour is spoken of in an artistic sense, it consists of three elements—of light, of tint, and of tone; and that a painter will consider himself a colourist even while his pictures are deficient in one or even two of these elements.

Now, in a good photograph you are always sure of two of these three elements—light and tone, and you have then what artists call colour, when speaking of works in monochrome. You have perfect *chiaroscuro*, far more elaborate than the most skilful artist's hand can accomplish. Possessing these grand essentials to pictorial representation, why sigh for local colour?

Science often proves and establishes as a law what may have been practised from experience for centuries previously to the discovery of this law. In M. Chevreul's work, on the *Contrast of Colours*, he says, that theoretically speaking, a correct pictorial representation of an object may be produced by black, white, and the local colour. The practice of some of the greatest painters has been in comformity with this principle. Their pictures were highly finished in *chiaroscuro*, like an engraving, although not always strictly in black and white, but in some transparent brown for the shadows and white for the high lights — the intermediate tones of grey by suitable mixture of the brown with the white. I remember seeing a picture in the British Institution, some years ago, painted by one of the great Dutch masters. It was painted in *chiaroscuro*, in burnt umber and white, and it excited my greatest curiosity and admiration. All that was wanting to complete it as a picture was to apply transparent local colours in their appropriate places.

After all, the photograph is deficient in one important element. It has not the artist's power of transforming: it is terribly literal. It takes things as it finds them, and possesses no power to arrange, select, or combine. Therefore you will have to teach yourself many things in your vocation of art-photographer which to the painter are of very secondary consideration.

To produce all the best effects of *chiaroscuro*, upon which the excellence of your works depends, you must be very particular in selecting the best point of view, and the most favourable hour of the day, when the shadows fall nearly horizontal. How can you do this before you have made yourself acquainted with the principles of art? What do you at present know of the laws of relief, of invention, of composition? and who will take the trouble to teach you, if I don't?

Your camera is a machine, and you are a mechanic, unless your labours are guided by the intelligence that patient study ensures. No matter what your natural aptness may be, you must study and think, and labour.

Most of the great artists of former times were very accomplished men — not mere painters, or sculptors, or architects, but frequently all these combined, and much more. Remember Michael Angelo — painter, sculptor, architect, philosopher, poet! Think of Leonardo da Vinci, and his varied attainments! The wild Benevenuto Cellini could fortify and defend a city, engrave a medal, or cast a statue, with equal facility!

Who among our generation is like one of these?

I remember listening to the discourse of an old French artist, whose acquaintance I made some years since: he was one of those many-sided geniuses who can do all things well. To look at his pictures, you would say, "Ah! here is a great painter!" He would take you into another room and show you a host of exquisite clay models: you would innocently ask "Whose are these charming productions?" and he would say, "The occupation of my hours when not employed in painting." He would then open a portfolio of etchings — the work of his long winter evenings! I cannot stop to swell the catalogue of his various talents. But I remember his words—"In any profession but that of artist it is sufficient to know *one* thing well; but the artist must know all things, and know them all well." This must have been the faith of the great masters.

The artist not only imitates, he transforms — re-creates. You may select twenty artists, all equally clever, and place them before any given object, and request them to make a faithful picture of it. Yet, strange to say, each working conscientiously to the end indicated, no two pictures will be alike! It is the same with the poet: he takes a current thought or idea, and passing it through the laboratory of his mind, transfuses it, informs it with the spirit of his genius, and recreates it. But no other poet will reproduce the same thought in the same terms of expression. You may constantly see the same diversity in the productions of the photographer, mechanical though they appear to be. Yet how easy it is to recognise in the photograph the directing power of an informed hand obeying the educated eye!

P.S.—From your last letter to me, I strongly suspect that my labour in seeking to inform you upon what you are really ignorant, is thrown away. You presume to question and cavil, forsooth! And a letter I have just received from your grandmother, who is in great tribulation about you, confirms my worst suspicions. She says you are never without a short pipe in your mouth, and that she caught you the other morning anointing your upper lip with some of Rowland's macassar oil. The best thing you can do is to put my letters into a preserve jar, seal it carefully down, and bury it in the garden for some seven years. At that date, having gained some wisdom with your last teeth, you may be prepared to appreciate what you now contemn. It is much less trouble to be a mechanical photographer than an artistic one. I do not suppose you will be content to remain long only the former; and perhaps when you have arrived at a proper appreciation of the insignificance of the one and the exaltation of the other, I may resume the subject, and return to an exposition of my views of artistic photography.

Foreign Correspondence.

Paris, October 27, 1859.

I WAS agreeably surprised upon the reception of the number of your Journal for 15th December last, to find described in it so ingenious an actinometer as that proposed by your inventive correspondent and contributor, Mr. Burnett. Our Parisian milliners have a saying, which they often ingeniously quote, to the effect "that nothing is so new as that which is forgotten;" and although I at once remembered having read your description of Mr. Burnett's skilfully contrived apparatus, I confess, to my shame, having entirely forgotten it. I can only account for this *lapsus* by the fact of its being published so near the close of the year, when one is apt to think the year finished, and that anything new should be reserved for the new year. At the present time it possesses much more interest to me than it could have done then, by its connection with M. Nièpce de Saint Victor's researches.

I must at once vindicate that gentleman from the charge of plagiarism. He is so deeply absorbed in his own investigations, that he is likely to share the fate of Archimedes. I doubt if he ever looks into an English journal, and am sure he would never have heard of Mr. Burnett's invention unless I had told him. I fully believe that all he has published respecting uranium is entirely original with himself, and independent of any discoveries or inventions made by others. He is pursuing a path of his own; and if in the course of his researches he arrives at a result previously arrived at by another, the merit of originality is none the less his. Two voyagers may sail from a port, one to the east the, other to the west, and both meet at some distant isle in mid ocean not laid down in our charts, and both may fairly claim the merit of *original* discovery.

I have made many discoveries in science, purely original with myself, but which also occurred to others, in other parts of the world, at about the same time. Thus, during the famous trial of Madame Lafarge, for poisoning her husband, I daily repeated all the experiments made by Orfila and other toxicologists with respect to the detection of arsenic, when I hit upon Reinsch's test without thinking it was original, nor did I discover it was so before I saw it attributed to him. More than twenty years ago I proposed tar as a disinfecting agent, in conjunction with earthy matters, for slaughter houses, &c.; the same thing has recently been proposed by MM. Corne and Deureaux; and I cannot doubt that the discovery is original with them. I know they cannot have plagiarised from myself, because I never thought my suggestion worthy of publication. You will, I am sure, acquit M. Nièpce de Saint Victor of the charge of plagiarism, and give him the credit of being an independent discoverer. I suspect the English journals are not so carefully read in France as the French journals are in England. Nothing that transpires here escapes your keen inquiries, and I may even go so far as to say, that I know better what is going on here, in many things, from perusing your Journal than I could from any other source of information.

Among the recent useful applications of photography, I may instance that of copying tables of logarithms of five decimal places, from one thousand to ten thousand whole numbers. This is suggestive of other useful applications of a similar character, amongst which are photographic visiting cards. This ingenious application of photography is all the rage in Paris. To possess a miniature portrait gallery of one's friends is certainly a great privilege and pleasure; but the indulgence of the taste leads sometimes to amusing adventures. M. V., an eminent dramatic author, found one day upon his table the portrait of a very charming popular actress, whose unblemished reputation rendered the usual reserve of society unnecessary. He carelessly put this portrait card among his own. A few days afterwards our author had occasion to make a call upon a manager, who, being absent, he left, as he thought, his card for him. Next day the manager, who had long desired to attach the charming actress to his company, waited upon her, in the belief that she had called to offer her services. The lady could not understand the manager at all, still less how he could have obtained her portrait. After much perplexity she remembered that she had left her card with the dramatist, and no longer doubted that he had been the cause, innocent or otherwise, of the *imbroglio*.

It is said the manager is willing to give up the lady's portrait on one condition — that of obtaining the original as a member of his company.

M. L. Krafft has communicated to the editor of *La Lumière* an improved method of preparing iodide of ammonium, which is, I think of sufficient importance to lay before your readers. He says, "all the ammoniacal salts by double decomposition with iodide of potassium may be made to yield iodide of ammonium. Dissolve in as little warm water as possible 20 drachms of iodide of potassium, and in another vessel 8 drachms of sulphate of ammonia, also in the least possible quantity of water. Mix the two liquors together, ebullition takes place, and the mixture is left to repose. Upon cooling it deposits crystals of sulphate of potass; the mother waters contain the iodide of ammonium. These must be evaporated under a receiver in presence of sulphuric acid, if it is desired to obtain crystals. It is preferable, however, to take the liquid and add to it the quantity of strong alcohol necessary to form an iodising solution."

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

OPTICAL DISCUSSIONS.

To the Editor.

Sir,—Although it requires no small amount of courage to break a lance, especially on a subject of optics, with the Editor of The Photographic Journal, I feel I must enter the lists.

In the editorial note to my letter (page 250), you say, "Opticians have an objection, based upon experience, to transmitting an uncorrected ray for any distance," &c. It is to this doctrine I am going to demur, and I will combat it with experience.

The elements of the posterior lens of a portrait combination are usually *separated* to a greater or less degree; and why? because the results are better — the marginal definition is improved. Cement the back lens and the central definition is no better than when its parts are separated, even so far that the uncorrected ray emerging from the flint concave has to pass a distance of a quarter of an inch before entering the crown to be corrected. This is fact the first.

The second is, that in Petzval's last combination the same principle is carried out. Practically it seems all right, and based on the calculations of such a sound mathematician as Petzval undoubtedly is, cannot be theoretically wrong.

My third fact is, that even in such a delicate instrument as an astronomical telescope, a ray may be allowed to pass uncorrected for a very considerable distance before entering the flint. I myself have, to save the enormous expense of a flint disperser, made such an one: they are now, I believe, extensively manufactured on the Continent. The largest one constructed on this principle, of which I am aware, is that made by Mr. Barlow; the object glass (of *crown* glass) was 7·8 inches in clear aperture, with a focal length of 78 inches. At the great distance of forty inches from this lens is placed the concave disperser, of 59·8 inches focus —parallel rays coming to a focus twelve feet from the outer lens. The telescope bears a power of 700 on the closest double stars in South's and Herschel's catalogue. This latter fact is such a potent one that I need not adduce further evidence to prove that an uncorrected ray may be allowed to travel even a considerable distance.—I am, yours, &c.

81, *South Bridge, Edinburgh.* JOHN TRAILL TAYLOR.

[We perceive that we have been guilty of obscurity of diction in our remarks. The words "any distance" were meant to convey the idea of "any *considerable* distance" which does not apply to the components of the posterior portion of a portrait combination. In this case the film of air between the flint and crown lenses itself forms part of the combination; and the same observation applies to the orthographic form of Professor Petzval's lens.

It would not be possible to cement the back elements of the best portrait combinations nor those of the orthographic lens, for the simple reason that the proximate curves are not identical.

In asserting that "practical opticians have an objection founded on experience to transmitting an uncorrected ray any [considerable] distance," we merely enunciated *a fact* without expressing an opinion whether the objection were well or ill founded; but we may remark that the late Mr. Andrew Ross (no mean authority) was well acquainted with Mr. Barlow's experiments, and had *not* a favourable opinion of the plan.

With practical *astronomy* we are unfortunately but little acquainted, and therefore are personally ignorant as to the severity of the test adduced by you for a refracting telescope objective, 7·8 clear aperture and twelve feet focus. We have, however, had recourse to an astronomical friend, one who stands in the very first rank amongst astronomers, and he says:

"The double stars enumerated in Herschel and South's Catalogue were observed and measured with two instruments, both of *far less aperture* than the 7·8-inch object-glass to which you refer. These stars were measured with two equatorials — one having an object-glass 3¾ inches aperture, and 5 *feet focal* length, by Dollond; the other *a* 5-*inch object*-glass, by Tully, of 7 *feet focal* length: hence the separation of the stars of the above-named catalogue is *not a test* for an object-glass of 7·8-inch aperture and 12 feet focal length; nor is its bearing a magnifying power of 700 a critical test.

"By the subjoined list of the closest stars in Herschel and South's Catalogue, you will perceive that they are not difficult for a telescope which ought to separate equal stars 0″·5 in distance easily on favourable occasions.

		″	
32	Orionis	1·3	
ζ	Orionis	2·62	
57	Cancri	1·89	
ζ	Böotis	1·68	
η	Coronæ	1·57	
σ	Coronæ	1·45	
ζ	Herculis		seen single.
73	Ophiuchi	1·99	
π	Aquilæ	1·96."	

Had you compared with microscopical optics, we should have been quite at home with any test you might have proposed; but in either case we would have you remark, that the requirements in a photographic lens are totally different in a very important particular. With telescopes as with microscopes, the former especially, the *field of view* is limited to a very small angular space, and thus the degree of obliquity of the extreme pencils of rays is but little removed from the direction of the axis of rotation; but with photographic objectives the very reverse is the case. By far the greater number of the pencils of rays employed in producing a picture pass through the lens *much more obliquely* than even the extreme ones of those used in a telescope objective; and it is these oblique rays which suffer most when transmitted any [considerable] distance uncorrected.

We are obliged to you for entering into the discussion; we seek not our own glory, but simple truth, and shall be most ready to acknowledge any error of which we may be convicted. We are not so vain as to imagine that we are infallible; but as we do not adopt opinions without consideration, so also we are not likely to give them up without due reason assigned.

Now to maintain your point with respect to a telescope object glass (setting aside any question of its bearing upon a photographic one), you ought to show that the *definition* of an instrument constructed as described by you, is equal to one of like aperture and focal length, constructed on the ordinary plan. We have no doubt, from what you say, that a *good* telescope may be obtained at a reasonable cost in the manner you describe, but question whether it would be equal in performance to a well manufactured one of the old form of corresponding size.

We think the weight of evidence is against you.—Ed.]

PARAFFINE PAPER PROCESS.

To the Editor.

Sir,—Since my last note, which I thank you for kindly inserting in the Journal, the experiments on the modified waxed-paper process have been occasionally continued; part of the results I now have the pleasure to enclose, with others, for comparison, taken last year by the method stated in my first communication. Iodide of zinc is easily soluble in paraffine oil as in belmontine; gutta percha also in both by gentle heat. With those in the paraffine I have attempted to take some negatives, but do not find any advantage over the original plan. The gutta percha, two grains to the ounce, it is true renders the paper very transparent. The negatives are left unwaxed that you may see the mottled appearance they present, which I expect would be removed on re-waxing. The papers prepared with it and iodide of zinc are less sensitive; they bear the developer well. The iodide of zinc, though furnishing an iodide readily soluble in the paraffine, appears to give a coarse precipitate of iodide of silver after floating on the sensitising solution.

Covering the paper first with a surface of iodised albumen as you suggested, I have, at least temporarily, set aside, owing to the great difficulty of preventing stains and irregular development, which I attribute to the partial displacement of some of the paraffine when floating the prepared papers on the sensitising solution, that leaves a greasy kind of film on the surface of the liquid, which attaches itself strongly to the next paper — and this especially if the papers be not perfectly dry. Enclosed is a well marked negative for your examination. I think of returning to free iodine in the paraffine, and a soluble iodide as potassium sodium, ammonium, or calcium, in the albumen liquid, adding sugar of milk, for I find it assists the development. Perhaps the use of Iceland moss, as suggested in the positive printing process, by Mr. Hardwich, might be still more favourable to density: though this will involve the necessity for re-waxing, it will permit the use of much thinner paper than the generality of the English papers—Marion's and Canson's being those I have hitherto found the best for the purpose.

Pray make any comment on this communication that you may think necessary, for the subject is one of interest, and your remarks are always so practical that they will not fail to attract the attention of yours, &c.

Woolston, Southampton, Oct. 20, 1859. R. L. MADDOX, M.D.

TONING.

To the Editor.

Sir,—As you so frequently recommend Maxwell Lyte's gold toning formula, will you be kind enough just to analyse the description of the process as stated in No. 90, March 15, viz.:—

"The proofs printed darker than required to appear when finished are first laid in a dish of clean water."—Question 1. *How long to soak? in soft or hard water?*

"Then remove to salt and water;" no definite quantity given.—2. *State quantity of salt to quantity of water.*

3. Should the print be placed in the toning bath immediately on removal from the salting bath, or should it not be well washed after the salt bath before immersion in the gold?

"The mixture *should* be neutral."—4. If not neutral, how must it be made so?

"On removal from the bath *(gold)* to be placed in pure water."—5. *Hard or soft? and how long in the water?*

6. "A *fresh* solution of hypo."—Does that imply a fresh portion for each print, *or* how?

"The portion of gold toning used must not be returned to the stock bottle."—7. *How* long may it be used? If put into a bottle by itself, *what indicates* its becoming useless?

Now, if you could give a plain formula for the above process, with all the quantities definitely put down, I think it would be extremely useful to many of your readers.

With my best thanks for previous information, I am, yours, &c.

M. C. C.

[1. Five to ten minutes; soft water if at hand, but it is not very material, the object being to get rid of all free nitrate of silver.

2. Not important — a saltspoonful of salt to a quart of water answers well.

3. It is as well to rinse it after the salt and water bath before putting it into the gold bath, under any circumstances; but if intended to be kept for any lengthened time before going into the gold bath, it is absolutely necessary to prevent the half-tones being injured.

4. By adding to the acid gold solution one of *carbonate of soda,* until litmus paper is no longer reddened.

5. Soft water preferable. A few minutes, say five.

6. Not for each print, but for each occasion when used — that is, if you tone and fix a dozen prints, one after another, the same bath will do (provided it contains enough hyposulphite of soda to dissolve out the silver); but if used to fix one print only to-day, the same bath should not be employed to fix even one to-morrow; because, after use, the bath contains *hyposulphite of silver,* which brings about decomposition in the bath, if kept.

7. Until it no longer tones. Generally a day or two after use, a dark coloured deposit will be found in the bottle, in which case the liquid is useless, the gold having been all precipitated. It is not difficult however to use a fresh quantity for each print, and this without waste, if you remember that *a grain of gold* salt will tone thoroughly a full sheet $22\frac{1}{2} \times 17\frac{1}{2}$ inches. The quantity of bath measured out may be expanded by the addition of water to a convenient working quantity. Provided the requisite quantity of gold be present, the actual *strength* is not of much consequence, though it may influence somewhat the rapidity of the operation. —Ed.]

FORMULÆ—CONVERTING POSITIVES INTO NEGATIVES.

To the Editor.

Sir,—The valuable communication of M. Blanchere, on *cadmium* in collodion, in your *last* number, is *lost* to *many amateurs,* by the quantities being expressed as 7·50 drachms, &c., &c., 0·25, &c., instead of *plain English.* Many beginners and others are *ignorant* of these symbols. Would you kindly explain.

I find a *positive* can be converted into a *negative* by *re*developing with pyrogallic acid *after* the *usual iron* developer and cyanide fixing process: in the daylight the negatives thus produced prints well; is this usual?

An answer will oblige, yours, &c. SUBSCRIBER.

October 26, 1859.

[We were under the impiresson that the formulæ given were in *very plain English.*

The quantities are stated in decimal instead of vulgar fractions, for convenience of addition.

7·50 drachms means seven drachms and fifty hundredths, or seven and a-half drachms; and 0·25 drachms twenty-five hundredths, *or a quarter of a drachm.*—Ed.]

ANSWERS TO CORRESPONDENTS.

Rustic.—Send a directed envelope.

H. Meigs, Boston.—You will find the formula in No. 98 of this Journal.

Emma C.—Thirty-six centimetres by twenty-eight is equal to fourteen inches by eleven, very nearly.

Secundem Artem.—See Mr. Wall's articles on colouring; and if you have any difficulty, write to him, as notified at the end of his paper.

Omega.— Your questions have been repeatedly answered in this Journal: refer to the back numbers.

T. B.— We cannot promise a *favourable* review — that must depend *entirely* upon the merit of the production. We submit to no conditions.

Crayon.— At present photographic engraving looks more promising when executed on stone than on steel; in the latter there is a dull opacity in the shadows which greatly mars the artistic effect.

Nil Desperandum.—The twin lens camera unquestionably. Send a directed envelope, and we will endeavour to supply the other information required.

Benzoin.— If the lac does not readily dissolve place the bottle containing the spirit and the resin in warm water, or before the fire, but not too near.

B. Foster, Diss.— It will be necessary for you to obtain a "copying camera:" any cabinet maker will make you one upon receiving proper instructions.

M. M.— No portfolios we have ever seen are so good in every respect for preserving photographs as those invented by Harvey, 16, Rathbone Place, W.C.

R. Salter, Ipswich.—We believe the exhibition will be opened early in January next, so you will have ample time to prepare your specimens for it.

Pyroxyline.— There ought to be no difficulty in obtaining a good collodion now-a-days; but you may spoil the best that ever was made by carelessness or injudiciously tampering with it.

Sat. Sol.— There is no substitute for hyposulphite of soda for fixing positive proofs that will answer so effectually. It is to be hoped that one may be discovered.

Experimentalist.— Use Maxwell Lyte's gold toning formula and a foreign paper to obtain violet tones, or an English paper for brown or black shade. The different nature of the sizing influences the result, but *not* the salting material.

Black Tips.—You may remove the stains without cyanide of potassium thus, viz.:—touch the stains with tincture of iodine, and let them dry — then use strong solution of iodide of potassium; do this alternately till the blackamoor is washed white.

Steph. King, Mansfield.—The best salting material for positive paper is unquestionably chloride of ammonium, to which a few drops of *liquor ammonia* are added to neutralise any acid that may be present. You had better float your paper on a mixture of equal parts albumen and water, and dry the paper, when floated, as quickly as possible.

Cyanos.— Cyanide of iodine consists of one equivalent of cyanogen and one equivalent of iodine. It is always produced when a liquid containing cyanide of potassium is mixed with pure iodine. It was proposed some time ago, by M. Humbert de Molard, for fixing positive proofs. It is a very dangerous compound, and as we can do very well without it you had better have nothing to do with it.

R. R * * * s.—We are obliged for the kind feeling which dictated your communication. Although we certainly have no reason to spare the writer alluded to, we cannot publish your letter for two or three reasons. 1. We will *not* notice an insult that in itself proves the perpetrator to be devoid of all self-respect. 2. We do not care to bore our readers with our own annoyances. 3. We should be following a very bad example. 4. Your article is very caustic, and *too true* to be borne with equanimity by the victim.

H. Baldock, St. Ives.—It is impossible to say what alterations are required in the lighting of your portrait gallery without inspecting it. Proceed methodically in the arrangement of your screens. The effect you desire to obtain is that of good *chiaroscuro;* without it you certainly will never obtain a good effective portrait. The flatness you describe is due to a want of difference in the amount of light on opposite sides of the sitter: one side should be darker than the other. Illuminate one side with direct light, and the other by light reflected from a dull white curtain or screen.

T. A. Morris — Your wishes respecting the copy of the Journal shall be communicated to the person who has charge of that matter. Respecting the stereographs sent, they are all more or less *under*-exposed; but No. 1, which you call "fogged," is by far the best of the three. It is not "fogged," but there is some little indistinctness in consequence of movement of the figures, and in some cases change in position between the times of taking the first and second impression of each pair. This is one strong argument in favour of the bi-lens camera. No. 3 is second in quality, while No. 2 is very much underdone. You should give longer time for exposure, and we think you would find better results arrived at by adding about *one* grain of bromide of cadmium to each ounce of your collodion.

We are not acquainted with the *commercial* value of negatives, but your positive proofs would not be regarded, in London, as of any value at all, they being all more or less defective. You have mounted the two pictures of No. 1 too far apart.

The particulars at the back of each are useful where they are for circulation amongst novices, but of no general utility.

*** Owing to a press of matter we have been compelled to leave over till our next number the conclusion of the "Glossary," some important communications, and several advertisements.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal, *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 106, Vol. VI.—NOVEMBER 15, 1859.

It would be a pleasing novelty in the history of prize-giving if it could be truly affirmed that the awards made had given universal or even general satisfaction. We fear, however, that heartburnings are inherent in the system; and did we desire to ascertain the course most likely to encourage "hatred, malice, and all uncharitableness," we should probably find it in the offer of rewards for the supposed encouragement of something else. We have so frequently observed this result to occur, that we do not wonder at finding that it has happened amongst some of the candidates for the smaller prize offered by the Duc de Luynes, for the best permanent method of printing photographs, lately awarded by the authorities of the French Photographic Society.

It will no doubt be remembered that, after having examined the various schemes laid before it, the committee charged with the award determined to test the respective merits of certain of them selected for more precise investigation, by calling upon the propounders of the several plans to operate in producing proofs before the members of the committee, as affording the best possible test of the feasibility of the processes proposed—such foreign candidates as there were having their written directions carried out by skilful manipulators amongst the members of the committee.

The conclusion arrived at was, that none of the candidates were deemed worthy to receive the entire prize, which, however, with the consent of the donor, was divided amongst five or six in the form of gold medals. As might have been foreseen, such a decision has by no means given satisfaction; and certain of the candidates, Messrs. Salmon and Garnier, have gone the length of serving the authorities of the French Photographic Society with something like a legal protest—not *nominally* against the award it is true, but for having divulged the details of the process employed by those gentlemen, although one of the conditions required of *candidates* for the prize was an unreserved publicity.

In noticing this matter we take the opportunity of again suggesting what we believe to be the only sound principle of affording to photography encouragement by presenting prizes, viz.—that of distinguishing eminent services or peculiar excellence in manipulative, artistic, or scientific skill, by the presentation of something by way of *acknowledgment*—and not as a reward to the most successful amongst *competing* candidates—wherever and whenever unusual excellence may be displayed, without regard to competition.

To illustrate our meaning more clearly, we will put a suppositious case. A Society having a given income determines to set aside a certain amount each year to be distributed in the form of prizes. Suppose, for instance, the Photographic Society should determine to devote an annual sum of say £50 for this purpose. After the close of each session a well-selected sub-committee should be appointed to review the proceedings of the past year, and consider, 1st, Whether any new and important principle had been introduced into any branch of the art, and if so, by whom? 2nd, Whether any obscurity in the phenomena known to exist had been cleared up, *e.g.*, the cause of fading, &c.? 3rd, Whether any pictures at the Society's Exhibition were pre-eminently distinguished for artistic excellence, combined with manipulative skill, &c.? 4th, Whether any important improvement in apparatus, &c., had been introduced? If under any or all of these heads it should be found some cases were peculiarly worthy of note, it should be the duty of the said sub-committee to *recommend to the Council of the Society* that certain individuals, instrumental in their introduction, should be presented with some appropriate acknowledgment.

The Council of the Society should then decide upon the expediency of carrying out the recommendation in each case, and the nature of the presentation to be made.

In the event of there not having been anything during the year deemed worthy of special recognition, the funds not so employed might be added to those for the succeeding year, and so on, until an unusually heavy demand upon them might arise.

Successful competition *alone* can never be a fair test of merit. Before this can be conceded, the number and qualifications of the candidates must be taken into consideration: the *best* might in some cases be very mediocre, whilst in others even the worst might be meritorious. By such an arrangement as we have supposed, most of the evils of prize distribution would be avoided while any advantages would be retained; and under the scheme we have sketched, every one who might have contributed to the advancement of the art, whether by furnishing papers read at the meetings, or by oral communication, or by pictures, or apparatus exhibited, &c., would have a fair chance of a recognition of his services.

We commend to the consideration of the Council of the Photographic Society the letter of an anonymous correspondent which we publish in another column. The first meeting for the session (a report of which will be found in the usual place) was certainly anything but creditable to the managers of the Society, and far from complimentary to its distinguished President, to whom every acknowledgment is due for the kind interest he takes in its welfare. At his time of life there are not many others whose duties are so laborious, whose elevated positions have been for so long a time attained, and yet who would have taken the trouble, on a bleak November evening, of leaving their comfortable fireside to preside at any meeting, much less at an abortive one. We should not have remarked upon this subject, perhaps, had not our attention been specially directed thereto by the letter from an *old member* of the Society. But we allude particularly to the meeting, in consequence of the announcement made by the Secretary, relative to the alleged solution of the problem of carbon printing, by M. Joubert. It may appear premature to express our want of faith in the fulfilment of the promises held out; yet we must confess to strong misgivings on the subject, and these are chiefly induced from the wording of the letter that was read from M. Joubert. The most perfect copy of an engraving that can be attained *is no solution of the difficulty*, there being no true half tones therein: the middle tints of a photograph, which constitute some of its principal charms, have hitherto proved the stumbling-block of carbon printing; and, from the absence of any remarks on this important particular in the letter, coupled with the marked stress laid on the wonderfully accurate imitation of an original engraving, we infer that but little real advance has been made. By the time

these words reach our readers we shall probably be in a condition to judge more correctly than we can at present pretend to do.

But upon carbon printing proper we have somewhat to observe. We have for some time entertained an embryo scheme, founded upon one of the photo-lithographic processes, but which, from our want of familiarity with the printing part of lithography, coupled with the constant occupation of our time, we have hitherto been unable to put to the test.

It is found that printing-ink will adhere to the gelatine, hardened by actinic action under the influence of bichromate of potash. In some of the ink-printing processes, albumenised-paper has been employed in conjunction with an alkaline bichromate, and when the unaltered bichromate has been washed out of the paper, the albumen *has been removed* from those parts not impressed by exposure. In one of the patent lithographic processes the stone is prepared with a mixture of gelatine and bichromate of potash, the impression made under a negative in the usual way, the unaltered mixture removed by washing, and the image rendered visible on the stone, by passing an inking roller over it while still wet — the ink adhering to the hardened gelatine. We remember hearing Mr. Pouncy say, with reference to this patent, that the process was a failure, in consequence of the ink *breaking away* from the stone in the subsequent operation of working off the proofs, and this because the ink was not actually on the stone but only adherent to the gelatine thereon.

On thinking over our printing scheme, our plan was to proceed as follows: — A sheet of albumenised-paper to be floated on a saturated solution of bichromate of potash, either with or without the addition of oxalic acid (the latter hint we took from Mr. Burnett); this to be exposed for a few minutes under a negative, and then thoroughly washed; the impression would then appear of a buff tint, glossy in the shadows because of the albumen, but dull in the lights, from which it will have been washed away. While still wet it is to be laid upon a sheet of plate-glass or smooth slate, face upwards, and pressed lightly with a sheet of blotting paper to remove surface moisture, and then a printing roller charged with ink to be immediately passed lightly over it. As the paper would be in a condition precisely similar to that of the lithographic stone, the albumen being substituted for the gelatine, we expect that the ink would adhere to that part, and be repelled by the lights which would be saturated with moisture.

As we have already stated, we have had no opportunity of putting this idea into actual practice; but while we have been dreaming over it, a French photographer, M. Asser, seems to have hit upon an analogous method of operation, and, what is more mortifying to us, has actually put it into practice, as we are informed.

He is said to have employed unsized paper, to have coated it with starch, and then treated it much in the same way as that we had proposed to do — only that with starch it is needful to be more careful with the washing, and to dry and *heat* the proof and again moisten it *prior* to inking. He also mixes a little *varnish* of some kind with the printing-ink.

Our own scheme would be the simpler of the two if found successful in practice. We wish that some of our energetic readers would try it; but be the result what it may, M. Asser has certainly anticipated us in publication, and we shall have lost all claim to any of the honour that might possibly have accrued. We are forcibly reminded of our school days, when we used to write in round hand

"PROCRASTINATION IS THE THIEF OF TIME."

We have little doubt that, simultaneously with the publication of the present number of The Photographic Journal the regulations relative to the forthcoming exhibition of the Photographic Society will appear in its own organ; but as there are not a few of our readers who do not see that publication, we beg to remind them, that it has already been notified that the contemplated exhibition will be opened in Pall Mall early in January next, and that consequently contributions will be required to be sent in at about Christmas time. Those intending to send specimens will therefore do well to prepare them.

This would be a valuable opportunity for the comparison of the results of the various dry processes: we feel convinced that those who have the arrangement of the pictures would hang *together* the specimens intended for such illustration if so requested. But in order to accomplish this end more certainly, and with as little trouble as possible to the hanging committee (and only those who have tried it can know how extremely necessary it is to lighten the work as much as possible), we would suggest that labels should be attached to some part of the *front* of the specimens intended for the purpose, bearing the words following, written in legible characters, viz.—" Illustrative of the ——— Process," the blank of course being filled up by the name of the process employed.

PHOTOGRAPHIC CONTRIBUTIONS TO SCIENCE.

It appears to be a singular freak of nature that the offspring of parents, diverse in their kind, sometimes inherits the vices of both progenitors, whilst in other cases all the good points of each seem to centre in the same favoured individual. In this latter category we may class photography, the child of science and of art.

We have on several previous occasions had to make favourable mention of certain contributions to what we regard as its maternal parent, ART, for which we have been indebted to that infant Hercules — Photography: we have now to direct attention to another boon, in the shape of a valuable contribution to its paternal progenitor, SCIENCE.

Many as have been the advantages which science has derived from this new aid to its powers, it is only here and there that the *utile* and the *dulce* have been so harmoniously combined as in the case to which we are about to allude, in which photography and stereography play an equally important part.

Some of our readers have doubtless, by M. Ferrier's aid, been enabled to climb the mountain passes of the Swiss Alps, and feast their eyes on glittering glaciers. Mr. Piazzi Smythe has rendered accessible the lofty regions of the Peak of Teneriffe, and brought down for quiet inspection in our homes the marvellous dragon-tree. Messrs. Negretti and Zambra, the official photographers to the Crystal Palace Company, have some time since had a gentleman in their service, who has been devoting his energies to the delineation of subjects of considerable interest in China, some of which we noticed casually in our report of a *soirée*, given by the Lord Mayor at the early part of the present year.

In the Pacific Ocean there exists a mass of islands, known as the Indian Archipelago, the northernmost group of which, the Philippines, is a dependency of Spain. Of this group the largest island has an area of something less than 60,000 square miles, its greatest length being not much shorter than that of Great Britain, though considerably less in breadth, especially at the centre, which in fact is nothing but an isthmus, nearly fifty miles long and about twelve broad, connecting the northern and southern portions of the island, which bears the name of Luzon. The whole island is more or less mountainous, and amongst the mountains are several that are volcanic, one of which, the Taal, is somewhat singularly located, being in the *middle of a lake.* To this volcano the enterprising photographer wended his way, according to instructions received from Messrs. Negretti and Zambra, incited thereto by some zealous geologists who were anxious to pay a visit to the spot in such a convenient manner by deputy; and, having been there, he brought away with him that for which he went — an exact transcript of the crater.

We cannot forbear laying before our readers the following extract, so full of interest, from a letter received by Messrs. Negretti and Zambra from their representative:—

The Taal Volcano, in Manilla, is situated in the middle of a lake; the circumference of the crater is probably half a league.

According to your instructions I started from Canton and proceeded to the Philippines. Arrived at Manilla, I went on to the village of Taal, from thence on to the crater. I left the village at midnight and got to the spot at eight in the morning, travelling by canoe. Arrived at the edge of the crater, I pitched my tent; but such was the heat of the place, and *so dense the steam that arose* from the fissures, that I was glad to move further off to avoid being suffocated. Having found a more convenient spot I tried my first plate; nothing! second, ditto; third, fourth — all black, all over-done: suffice it to say, that though I had been giving from thirty to forty seconds, with same light and same chemicals, the day before, I obtained the negatives I send you with *four seconds'* exposure — a curious circumstance deserving investigation.

I was surrounded with sulphurous vapour, more especially when the wind (which was continually shifting) was blowing towards me: such was the density of the vapour, that on one occasion indeed my two guides bundled into my tent, to the great danger of my bath and chemicals.

I send you the three negatives I was enabled to take, and would have gladly sent you duplicates, but after about a couple of hours' work my bath got covered with a black pellicle which adhered to the collodion, causing the plates to stain all over, so I was obliged to give up.

On the north-east of the small crater you will see a small lake: its waters are covered with a white vapour like steam; its borders strewed with a greenish white sulphurous substance, caked like ice on the edge of a pond. The effect all along the edge of the lake is very curious. I attempted to descend from the great crater to the inner one, in order to follow your instructions as to the temperature and density of the water; but I felt so weak from excessive perspiration that I was obliged to desist: it has to be done by a rope. I however sent down one of my guides who brought up a gourd full of water, the temperature of which, was, when I received it, 110° Fahrenheit. I will send it to you if I have no accident, as it might be interesting to some of your scientific friends.

I left the crater about twelve o'clock, and returned to Taal by half-past-five, having wind and current in my favour. I have already told you of many difficulties I had, especially in Canton; but this volcano photographing beats all. I sincerely hope your friends will not suggest any more such interesting objects for your photographer to take. As to Japan, I have no doubt I shall get on very well but if I hear that a volcano exists there I shall be tempted to turn back, as I think one volcano in my life will be sufficient.

Three admirably-printed glass transparent stereographs, from the negatives mentioned in the above extract, are before us, and anything of the kind more interesting it is not easy to conceive of. Very few of us have had the opportunity of taking a peep into the crater of any volcano: what a privilege we ought then to regard the power of looking into one upon such easy terms, and that one of such an unusually interesting character!

In one of the slides, the smaller inner crater, with the smoke issuing from it, is visible, together with the hot-water lake mentioned in the letter; while far away, over the further edge of the large crater, are seen the more distant mountain ridges, and in another the waters of the mighty deep.

It will readily be acknowledged that the production of such specimens is no ordinary task, whether we regard the distance of the locality, the difficulty and expense of reaching it, and lastly, the severe expenditure of labour and strength requisite to procure the negatives when there—the value of which, in a scientific point of view, is scarcely calculable.

We sincerely trust that Messrs. Negretti and Zambra will meet with the encouragement they so richly merit, by an extensive demand for these highly instructive and interesting subjects, and thereby be induced to renew their efforts for placing before the public specimens so well calculated to elevate the taste and inform the mind.

CONTROVERSY RELATIVE TO THE SWING-BACK CAMERA.

REPLY TO OUR CHALLENGE.

By N. Ennel.

In No. 99 of your valuable Journal I found, at page 184, the article alleging to deny the correctness of my observations in the *Journal of the Photographic Society*, with regard to the swing-back. I truly regret that I was, till lately, ignorant of this article, or I would have replied to it immediately after its appearance.

I must confess I feel rather puzzled to know how to shape the course of the argument after so clever a feint of yours in knocking down my premises like nine-pins, without saying why. You merely *cannot* assent to the premises, nor, of course, to the conclusion. Suppose we put the case in the form of a syllogism:—

All circles projected on an inclined plane are ellipses.* (Major premise).

The back of a camera not parallel with the front is an inclined plane. (Minor premise).

Therefore, every image produced on the swing-back is distorted. (Conclusion).

Can you detect here any fallacy?

But I must not forget that you ask for a *nicer* definition of "*every point*," and of "*distortion*." I thought these terms plain enough, and had not given any definition; but in deference to you, who think otherwise, I will say that by *points* I do not mean mathematical points, but visible forms, with certain proportions, as perceived naturally and in conformity with certain laws of perspective; and by *distortion* I understand a false representation of these forms, *i.e.*, a representation in which the relative proportions differ from those of the original. These definitions, I trust, you will not find dogmatical, seeing that I use the terms not in a particular but general sense, and in the common acceptation of the words. *Distortion* must not be attributed to a medium only, but be acknowledged wheresoever found, without reference to its cause; let the cause be, as in the case before us, the disturbance of the parallelism between lens and back.

Having cleared the way thus far, I will proceed to show that, in spite of yourself, you have, in fact, assented to my proposition. You admit that in the case of a small distant window the swinging back would be *misapplied*. Why? Because the window would be misrepresented; instead of appearing, *e.g.*, a square, or a circle, it would be an oblong or an ellipse. Pray hold this fast. Let this little distant window be in a high tower, or in one of the houses on the one side of the street; focus it. The swing-back here, by your own admission, would be *misapplied*. Now you want to bring also into focus the more distant windows, and likewise the nearer ones of the tower or street; you swing the back, and at the same time you have distorted, at all events, *that little window you first focussed*. Now, you cannot surely admit this, as you must do, and as you have done, and deny the corollary that the next window, and the next to that, &c., are distorted! Or imagine the whole tower, or the whole side of the street, one huge window. If the proportions (or, as you say, *scales*) of a *small* window are not truly represented on the inclined plane, the disproportion of the large window must only be all the more obvious! In a word, your high tower and every detail of it will appear too *high*, your street too *long*, and every house in it, and the details too *wide* in proportion. But you go even further; you grant that "*the scales differing is an error*, but only an error of degree." Now, really, in a scientific point of view, is not "*error*" synonymous with "*wrong in principle?*"

[It will be perceived from the preceding how necessary it was to ask for *nicer* definition of the terms *points* and *distortion*. We demur to the interpretation of the former word, as we require it in its strict sense for our rejoinder; we propose to substitute the word *parts* to indicate Mr. Ennel's meaning. We shall abstain from detailed reply till our next — partly to give Mr. Ennel every chance of a fair hearing, and partly because we have no space to spare in the present number. We may, however, remark that we dissent quite as much as before from both premises and conclusions.—Ed.]

NEW STEREOSCOPIC CAMERA.

By R. L. Maddox, M.D.

The accompanying diagrams will, I trust, render intelligible the purport of this communication. It looks complicated, but is not so in reality. It may interest some of your readers, though without a sketch it would not be understood. The intention is to combine in a small space a stereoscopic, portrait, and view camera, with a draw of seven inches.

The mode of using it is with a dark bag, fastened over the back of the camera by a strong elastic band, and with two apertures at the sides, fitted with elastic, to admit the hands, closing tightly round the wrists.

The frame-door *h g* is raised to introduce the screen, and *g* closed on it to keep it in place: removing the screen the frame and door *h g* are held up to introduce a prepared plate, and closed together on it, to keep it in position.

* Being transverse sections of a cylinder that are not perpendicular upon the axis.

In the stereoscopic camera the draw-box, or inner part of camera, is flush with the outer or front edge of *a*, the part *n n* being attached to the second only, to save space.

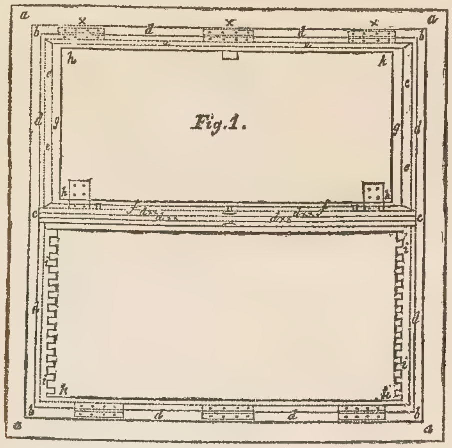
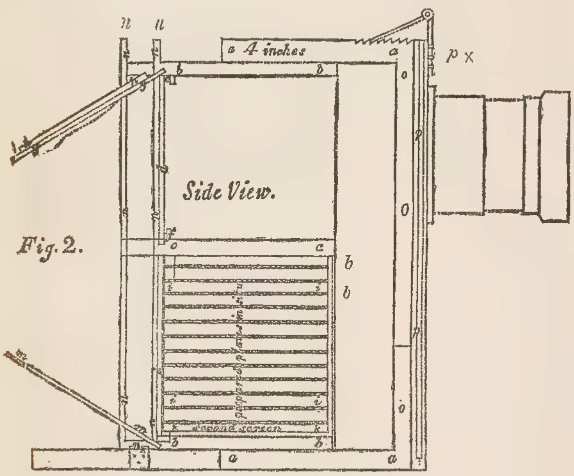


Fig. 1. Front view of outer and inner camera boxes, containing in the lower half the box for prepared plates.



a the outside box of camera, outside measurement 8$\frac{3}{8}$ inches square, made of $\frac{3}{8}$ths mahogany, or other wood; *b* the inner box of camera, to fit into *a*, made of $\frac{1}{4}$-inch mahogany, cut away at its inner edge for the $\frac{1}{8}$th of an inch all round as marked at *d*, and $\frac{1}{8}$th deep, and closed at back *b b* (fig. 2); *c* a flat piece of mahogany to slide in *b*, $\frac{3}{16}$-inch thick, and cut away at its front edge above and beneath $\frac{1}{16}$-inch, as marked at *d*** (fig. 1.), and $\frac{1}{8}$th deep; *e* thin pieces of wood fastened round the top and right and left-hand sides of upper half of inner box *b*, at $\frac{3}{8}$-inch from the outer edge; *f* a thin piece screwed or nailed to upper surface of *c*, at $\frac{3}{8}$-inch from upper outer edge, *g* upper door, consisting of a hollow frame hinged at front edge of *b*, and shutting tightly against the part cut away at the inner edge of *b*, leaving space between it and the thin pieces of wood *e* for the focussing glass or slides to be interposed; *h* a flap door that fits on the frame door *g*, hinged to fall downwards, and so admit of using the focussing screen, and shut tightly when a glass slide is introduced in the place of the screen; *i* small thin box, holding twelve prepared plates, and extra ground glass at *k*; *m* door to lower half of camera (fig. 2); *n** brass guide (fig. 2); *o* space for using a larger lens, to be attached to another front sliding door *p*, kept in position by some contrivance when raised, as *p**.

The whole of inner box removes entirely from the camera, to be replaced by another made on ordinary plan, attached to *n n*, where the screen and dark slides are placed for views or portraiture (fig. 2), unless it be preferred to have but one draw box and make the top and bottom doors, centre division *c c*, the part *b b* of lower half, and the plate box removeable, when one would suffice; this could be done by slight alterations in the measurements, or in hanging the doors differently, as by pins at the side.

Woolston, October 19, 1859.

TONING POSITIVE PRINTS.

By John Heywood.

[Read at a meeting of the Chorlton Photographic Association, November 9, 1859.]

The printing of paper positives has had some attention from me of late; and, as some gentlemen of this Society may have to print a few proofs occasionally, it may not be uninteresting to them if I briefly state the method which I find both economical, and producing results as beautiful as can be obtained by more expensive modes of toning. I use a solution for sensitising the paper, made of a sixty-grain solution of nitrate of silver to the ounce of pure water; to which I add a few drops of acetic acid (say ten minims to six ounces of solution); float the paper for five minutes, then hang up to dry in the dark, catching the drops. These papers will keep in a dark cellar for two or three days. Expose in the pressure-frame, and print very deeply; lay in water when printed, and after you have finished printing for the day, wash all in one tray for half-an-hour, and put the washing water into a large Winchester quart bottle, containing some common salt, to precipitate the silver in the form of chloride, by way of saving any waste; then wash the prints again in running water one-quarter to half-an-hour, put in strong salt and water (say half water and half saturated solution), and wash for five minutes; then rinse in water, and lay the print on a glass the full size of the paper; after draining, brush on the toning solution with a large soft brush, prepared thus:—

No. 1.

Bicarbonate of soda	5 grains.
Pure water	1 ounce.

or

No. 2.

Borax	120 grains.
Chloride of sodium (P.L. strength)	20 to 40 minims.
Pure water	2 ounces.

No. 3.

Another bottle, to contain solution chloride of gold.

Chloride of gold	1 grain.
Pure water	1 ounce.

Mix one minim of No. 3 with five minims of No. 1 or seven minims of No. 2 for each stereoscopic print. A stronger or weaker solution may be used; but a longer or shorter time will be required to produce the desired tone. I generally let the solution lie on until all redness is gone and a rich purple has taken its place; but this is a matter of taste. Two or three pictures may be in operation at one time, and as they acquire the desired tone, be placed in water to await the fixing solution, or they may be placed there at once.

I make a saturated solution of hypo, and take one measure, to which I add two measures of ordinary water, and let the prints remain half an hour. Should old hypo be used, or the immersion be too short, chloride of silver will remain, and on exposure to light the prints will change to a disagreeable dirty colour. When this operation is properly performed, the prints are of a pure white in the lights, and a clear purple-black in the shadows; but the tone is slightly varied by using No. 1 or No. 2 toning solution, and may be increased in depth by more printing, or a stronger nitrate of silver sensitising solution, which should be kept up in quantity by adding sufficient of an 80-grain solution. The prints now require washing; and as there may be doubts as to the time necessary, I lay before you the result of an experiment made in January last. The print was put entire into a bowl of running water, and pieces cut off at the expiration of one hour, at two hours, at three hours, at three-and-three-quarters, and at four-and-a-half hours; the pieces were then mounted in their original positions, and I think you will perceive no difference as regards the washing in any of them. The mount has been exposed for some months to the summer light, and has had more rough usage than pictures that are esteemed would be liable to. I think we may now say that, with ordinary care, our prints will not fade away as they did not very long ago. The expense of a toning bath, where it can only be used for a few days, is rather considerable to amateurs; but by using the toning solution as I have described, you have no reduction going on except with what you are using, and you obtain a tone which is impossible by employing an old bath. To make it more evident, I

have two prints here ready washed, and I shall now proceed to apply the toning solutions No. 1 and No. 2, that you may see the difference in them. I have collected these formulæ from several sources, and claim no originality in any way. To several I am indebted for hints; I would thank those gentlemen. If any one requires information that I have omitted, I shall be very glad to afford it after the toning is finished.

CARBON PRINTING IN LITHOGRAPHIC AND PRINTING INKS.

By M. Asser, of Amsterdam.

Preliminary Observations.

Unsized paper, by its porosity, is readily imbued with water throughout its entire substance.

Those portions of the same paper upon which bichromate of potash, submitted to the action of light, are found, cannot be moistened.

Bichromate of potash, acted upon by light, and warmed at a high temperature, readily receives and retains printing ink.

Unsized paper, impressed with a picture formed by bichromate of potash strongly heated, and then moistened, may be inked like a lithographic stone, in this way:—the non-impressed parts remaining moist, reject the ink, while the impressed parts receive the ink, retain it, and permit of its being accumulated according to the degree of vigour and intensity desired. In substituting printing ink for transfer lithographic ink, we form a *cliché* or negative upon paper, which may be transferred to stone or metal by means of the autographic press. The image now reversed becomes right again when printed.

Unsized paper, covered with starch upon the side impressed with the image, has more stability to withstand the inking process, and is easier to remove about.

Special Process.

Take unsized paper, of medium thickness, and as even a texture as possible: plate paper answers very well—it is prepared specially for engravers. When the sheet is cut to the required size, mark the smoothest side, and then imbue it with an even coating of starch by means of a sponge. Suspend the paper by one corner to dry.

It is not absolutely necessary to starch the paper, but it is preferable, for the reasons specified in the preliminary remarks.

Float the paper, when dried, the starched side upwards, upon a concentrated solution of bichromate of potash in distilled water. The paper immediately imbibes this solution; it is then hung up in a dark room to dry, placing a piece of bibulous paper at the lower corner, to facilitate the dripping of the fluid.

When the paper is perfectly dry, place it, with an ordinary negative, in a printing-frame so as to produce a picture on the starched side. It is desirable that the negative be very sharp and vigorous, without deficiency of transparency.

At the expiration of a given time, which varies according to the intensity of the light and the transparency of the negative, remove the paper from the printing-frame when it appears to be sufficiently impressed with a reddish-brown picture, while the unimpressed parts retain a fine orange-yellow colour; then immerse it in a dish of clean water, image upwards, and remove any bubbles that may form between the paper and the water.

It must be allowed to remain in the water, covered so as to protect it from the light, until all the bichromate of potash, not acted upon by the light, is dissolved out, and until the paper exhibits a very clear image of a light brown colour. Withdraw it from the water and hang it up to drain and dry, and then place it on a piece of marble, heated as high as possible short of scorching the paper. The paper can then be smoothed with a flat iron or in a rolling-press.

This heating is an important element of success, as stated in the preliminary remarks.

Next moisten a sheet of unsized paper, cut to dimensions a little smaller than those of the impressed sheet, and lay it smoothly on a glass plate, and remove the excess of moisture with a piece of bibulous paper.

This done, float the impressed sheet for a few moments upon clean water, the image uppermost, until it is thought that the water has penetrated the texture of the paper and softened the starch. Then remove it from the water and place it upon the moistened paper on the glass plate, and lay over it a piece of sized paper, and rub it firmly all over with a handkerchief, to make the moisture penetrate those parts where the whites remain intact, and to make the impressed sheet and the moist paper upon which it rests, adhere more strongly to the glass; then remove the sized paper so as to display the picture. Previous to this operation an inking-roller must be charged with lithographic ink, mixed with a small quantity of varnish — too much will cause the experiment to fail; it is then passed lightly over the paper which has been exposed to the light, and the image soon begins to appear, becoming stronger with each application of the roller, in the same way as if a lithographic stone was submitted to this operation; and while it increases in intensity the whites retain their purity. If the first application of ink is successful, the image can be strengthened without fear by adding a little more varnish to the ink.

When the picture is sufficiently strong, float it in pure water, acidulated with a few drops of nitric acid, with the view of removing all the bichromate of potash and to leave only the ink. When dried the positive is ready.

If lithographic ink has been employed the design can be at once transferred to the lithographic stone or zinc plate. In that case, the picture must not be too highly charged with ink, and spread very uniformly, and the washing in acidulated water must be omitted. The transfer is easily performed when the paper is damp, not wet, so that the starch may attach itself to the surface of the stone or metal under the lithographic press. If the picture be very highly sized, it can be raised without accident, leaving the impression on the stone or metal, from which any number of copies may be printed. If it require retouching, it can easily be executed. It will be seen that for engraving on metal the system requires that he begin with a positive on glass; this supplies a negative on paper, which transfers as a negative to the metal from which positives are printed.

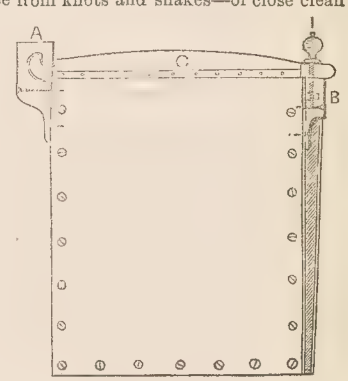
PHOTOGRAPHERS THEIR OWN ARTIFICERS.

By Thomas Gulliver.

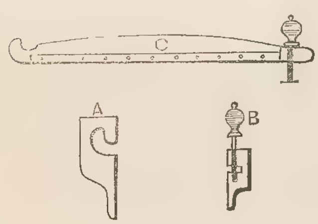
No. II.

WATER-TIGHT WASHING BATH, CAMERA STAND, &c.

The tent described in No. 104 of the Journal will require some special fittings, which, with ordinary care and attention, can be easily made. But first a word or two respecting the selection of wood. Yellow pine will be about the best for all purposes, and should be quite dry and free from knots and shakes—of close clean fibre, and of a pinky tinge (about the first and second leaf from the slab or outside piece of the "baulk" should be chosen). ⅜ inch and ½ inch stuff, *when planed*, will be thick enough for most of the work.



The washing bath should be 10½ inches deep, by 7⅝ inches wide, ⅞ inch at the bottom and 1⅜ inch at the top, outside measurement; 6¾ inch at top and ⅞ inch wide, tapering down to ¼ inch at bottom, inside measurement. It will take a plate 9 × 6½ inch, and will hold fourteen ounces of syrup water for washing the plates in. It must be firmly *screwed* together with thirty-eight screws, at intervals of about 1½ inches apart.



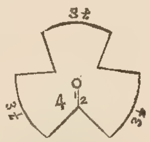
The two side pieces, A and B, are of mahogany ⅝ inch thick, by 1¼ inch wide, also the cross piece.

The thumb-screw is a fine thread swing-glass screw, sold at most ironmongers, and used in making frames for looking-glasses.

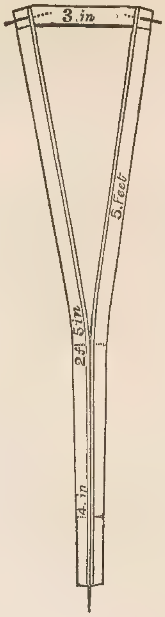
In making the bath, first screw one side on to the ends, well varnishing the wood several times, *and run the varnish between the joints when screwing up;* then screw on the other side, using plenty of varnish; let it set for a few hours in a warm room, then trim it up nicely and bevil off the top; screw on the mahogany side pieces A and B, let in the screw nut, and screw the side pieces firm; cover

the cross piece C with two ply of velvet, then with *thin sheet india-rubber* and strips of leather, and with brass pins nail it down. Varnish it over several times and the bath will be complete.

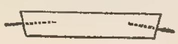
Of camera stands two will be wanted — the one with legs 4 feet 2 inches long, and the other 5 feet 2. The first serves for portraits and for the tent, the other for landscapes. The stands that are usually sold have heavy iron or brass tops, and birch or ash legs, and are generally constructed on a plan offering every impediment for packing, unpacking, and work. The following can be readily made, and are light, cheap, and convenient. The top is best made of mahogany, in form of a triangle — that is, a circular disk with three notches at regular intervals apart, thus :—



The "legs" of yellow pine, 5 feet long, $7\frac{1}{8} \times \frac{3}{4}$ inch wide, six brass ferules, six screws, and three steel pins, are all that are wanted.



After cutting out the top of the camera stand, cut six pieces of brass wire 2 inches long and about the thickness of a tobacco pipe; drive these into the mahogany top, each sloping a little downwards, thus :—



Then fit each of the six pieces intended for the legs with a brass ferule, and bore holes through them to fit the wires in the top; now sink in the three steel pins and screw them each with two screws; well varnish the legs, and when dry screw them firm with two large screws long enough to pass through both pieces forming the stand legs. The one large screw should be 4 inches from the bottom, and the other 2 feet 5 inches, thus a sufficient spring will be secured to clip the top of the stand. It will be, when finished, a good looking article, and quite as useful as it looks.

THE PATENT MIRROR STEREOSCOPE.

No one who has attended to the subject can have failed to realise the palpable fact, that a vast increase in the excellence and value of the stereographic illustrations published during the last year or two has been accomplished. At first, any thing that displayed the principle of the instrument used to view them was regarded with interest. The stereoscope became a household necessity: it was found to be universally popular; hence a demand arose for specimens, to enable the happy possessor of such a coveted treasure to display its accomplishments. In those days stereographs were secondary considerations: they acted simply as *food for the stereoscope;* but as the doctor in the play of "Le médecin malgré lui" remarked, with reference to the positions relatively of the heart and the liver, "nous avons changé tout cela."

The demand created was discovered to be an ever-craving appetite that grew upon that which fed it, and thus a requirement for a constant supply of better and still better productions set in. The demand, of course, was complied with, and eventually it occurred that the stereoscope and stereographs quite changed places. Purchasers ceased to buy the latter to show off the former, and began instead to procure stereoscopes, because they were *necessary,* in order to enjoy fully the beautiful illustrations that were every where offered to the public. It is also a fact worthy of note that the public were not slow to accept the offers. Under these circumstances attention was naturally turned towards an improvement of the instrument with which to view these miniature picture galleries; and many ingenious contrivances for its more effective operation, whether as regards increased comfort in using, or greater excellence in its illusive capabilities, were brought into play.

It was the case of literature over again: writers beget readers, who in their turn become thinkers; and thinkers give birth to writers — an ever-recurring cycle. So it is with stereoscopes and stereographs: as the excellence of the latter approaches nearer and nearer to perfection, the greater becomes the necessity for improved appliances wherewith to render them fully available for delight and instruction.

It is needless to pursue this theme further. We are not about to write a history of the stereoscope; but we could not forbear glancing at the events which have led up to the production of the very beautiful and effective instrument which we are about to describe, and which we regard as being about nearly perfect of its kind as it is possible for any one to require.

It will be remembered by many of our readers that, early in the current volume of The Photographic Journal, we described the achromatic stereoscope, introduced by Messrs. Smith, Beck, and Beck, the eminent microscope makers and opticians, of Coleman Street, London. The same firm is about to bring out a new form of stereoscope, under the title of our heading. We purpose, in a future number, giving an illustration of the instrument, but in the mean time consider it of sufficient interest to attempt a verbal description.

The original achromatic stereoscope, which may be regarded as a temporary fixture, if we may use such a phrase, was adapted rather for the purposes of displaying subjects at a *soirée,* where those present are generally in constant circulation, or for examining a series, by a single individual seated comfortably at his ease, with light conveniently adjusted, and all *en règle;* but in a family party or friendly gathering, the great charm of such an occupation consists in the possibility of passing the instrument, charged with its slide, from hand to hand.

The patent mirror stereoscope, like the other one, is furnished with achromatic lenses, and consists of a flat base of mahogany, or other ornamental wood, of about five inches by six. Above this, at an angle of about fifteen degrees, is a framework of wood, blackened, into which is set a plane silvered glass mirror; thus the compound base board is formed something like a wedge, being about one inch thick towards the eye end, and about half-an-inch towards the opposite edge. This arrangement allows of a certain small space *between* the mirror and the wooden part of the base, and in that space another piece of wood traverses, and is arranged so as to slide smoothly in and out by means of a rack and pinion, worked by a milled head on the right side of the instrument. To this sliding piece, at right angles, is fastened another piece, which carries the achromatic lenses fitted into brass tubes, also adjustable, and by means of that adjustment, together with that of the rack and pinion before described, a very extensive range of focus is insured, so as to render the instrument suitable to every kind of sight.

The arrangement for holding the slides consists of an elegant light framework of blackened metal, attached to the thin edge of the base, and of course at right angles to it; and this is strengthened by a metal strut, attached to the metal frame at one end, and to a piece of wood placed between the lenses at the other. This metal strut also subserves another purpose, viz. — that of keeping in place a division to shut out from each eye the possibility of its seeing also a portion of the picture belonging to its neighbour. This division is made of very finely-ground glass, and is most pleasing in its effect when viewing the specimens, which are supported in place by means of a couple of highly-tempered steel springs.

It will be perceived from the preceding description that there is no obstruction to the free admission of light from the top or either of the sides, and consequently this stereoscope may be used in almost any position of the light — that is, with the back or either side of the observer turned towards the source of illumination, for the division of ground glass previously adverted to does not perceptibly shut out any of the light, although it restricts the vision in the most perfect manner. This we regard as a very ingenious arrangement.

When the spectator *faces* the source of illumination, by slightly inclining the instrument downwards, the mirror comes into play and lights up the slide perfectly; and it appears to act in a way that quite removes the only objections to paper slides, that of rendering them strongly illuminated without showing the grain of the paper—an effect no doubt owing to the cross light destroying the shadows which in other cases render the inequalities visible.

The steel springs used to hold the slides in place are both mounted on a sort of minute metal bracket turning on a pivot — an arrangement intended to allow of their being turned aside so as to leave the metal frame entirely without projection of any kind. This is for the purpose of rendering the stereoscope available for examining *stereographs bound in books,* for which purpose it is adapted in the most complete manner; in fact, stereographs bound up with the letter-press as illustrations of the text can be examined *with as great comfort and ease* in every way by the Mirror

Stereoscope as ordinary slides are by the best of those now in use. This is no ordinary merit, and we have little doubt will act as an inducement to the publication of works illustrated by appropriate stereoscopic instead of ordinary prints. For works of travel or of scientific instruction, stereographic illustration would be invaluable.

A convenient *leather* handle is attached to the under part of the base board.

We have but one objection to make with reference to the instrument we have been endeavouring intelligibly to describe to our readers — it is mounted with semi lenses: we prefer them entire, for we hold that theoretically (and practically too) the use of a prismatic arrangement introduces errors that are needless; and though with achromatic prisms the only error of importance, lateral displacement of the image, can be rectified in mounting the pictures, the use of entire lenses would render special mounting in order to get the best effects quite unnecessary. This alteration may add somewhat to the cost of the instrument, but we should regard it as money well laid out. We shall certainly urge this point upon the manufacturers. At the same time, we do not hesitate to pronounce the Mirror Stereoscope unquestionably by far the most pleasant to use and most complete instrument of the kind that has been hitherto introduced.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. IX.

MORE than two weeks have elapsed since I last wrote to you, and I am still lingering around Jerusalem. But I have not been idle, as my portfolio will show; for I have been beyond the Jordan for a week, and among the hills of Moab, on the east side of the Dead Sea, and photographed many interesting scenes.

"Parson," said John, "Parson, I can't stand this; let's be off, down to Nablous. I've had enough of this place; and so should you, I think."

"Nonsense, friend John; I have not half done. Besides, we must wait here a week for our letters that will be due."

"We can come back for them!"

The idea was not a bad one. It was dull enough, truly, and getting warm. A daily stroll over Mount Zion, and along the hill Acra, by the Church of the Sepulchre; an evening seat on the summit of the Mount of Olives, to watch the sun go down beyond the city; a profound sleep, with dreams of old glories all night — these were the daily variations of my photographic business, and for these I was willing to exchange a ride over the hills on the north of Jerusalem.

So we went.

Mounting at day-break, we emerged from the Damascus gate in the cold grey light of dawn, and crossed Mount Scopus as the sun was shedding splendour on the eastern walls of the city.

Our troop of Bedouins was in fine spirits. They had been begging us to move northward, and were not aware that this was but a ride and a return.

We slaked our thirst at the Well of Beeroth, if I mistake not the ancient name — a fine fountain on the south side of the hills which were once the site of Bethel.

The sun was high up when we passed the place of Jacob's sleep, and we paused not till late in the afternoon. The road was miserable nearly every inch of the way. The hardihood of our Arabian horses is incredible. One-fourth of this day's labour would have knocked up the best horses of any other breed. But we rode into the valley of Nablous almost as fresh as when we left Jerusalem, though it was a ten hours' ride.

Three times on the route we passed the spots where our friends had encamped. Can I speak adequately of the interest which such a spot possesses? A still valley—a place where the breezes seem to linger with delight — is made far more interesting by the fact that a little while ago it was the home of some pilgrim from far lands, whose tent was pitched here — who slept, and dreamed, and woke, and prayed here, and passed on, and left the valley for me to come into, and wonder who he was, and where and whither his pilgrimage.

We rode up the valley till we came to a spot where another valley crossed it from the west to the east. This latter is the Valley of Shechem. At the point of crossing it is one of the most interesting places in this holiest land of earth.

Its interest dates from remote time. It was here that Jacob digged a well, and here gave to Joseph a piece of land. The title to that little piece of land has changed hands often since then, and would be now somewhat difficult to trace; but passing over unknown and obscure owners, it is not to be doubted that this is the land of Joseph. Here, too, was his grave. The Moslems have a rude mud-and-stone structure enclosing one of their common grave mounds, which they point out as the tomb of the lord of Egypt. It stands out in the plain, and without doubt, is on the land of Joseph; and I know no reason to deny that it may with some fitness be considered near the locality of his grave.

A little way from it, on the side of Mount Gerizim, is the Well of Jacob, where Christ met the Samaritan woman. He was travelling up the valley from Jerusalem, and arrived at this spot, where He rested while His disciples went up the side valley to make purchases in the city, and awaited their return. The side valley is a ravine between Mount Gerizim on its south and Mount Ebal on its north — the mountains of blessing and cursing. Both are desolate and uninteresting. The valley is fruitful, and the grain on its fields looks well.

Turning sharply round the spur of Mount Gerizim we rode at an easy gallop toward the walls of Nablous, which is the modern representative of ancient Shechem. Rattling through the city, cursed by women and boys who scampered out of our furious way, we found the tents of our friends pitched on the usual travellers' camp-ground, just without the walls on the west side of the city. They were absent, so we took possession *sans ceremonie.*

Their servants obeyed our orders without hesitation, and in fifteen minutes we had a smoking dinner on the tent table, flanked by a bottle of claret, to which we were doing justice, when they returned from making a visit, and were greatly astonished to find their tent and dinner in possession of the Philistines.

But not displeased, if we may believe them.

What a delightful evening we had of it, all going down the valley together to the Well of Jacob! The moonlight was clear and fine for two or three hours, and the old mountains lifted their heads into a serene sky, as if they had something akin to it in their own antiquity and the grandeur of their story.

The scene was picturesque. We were all on horseback. Our Bedouins rode in two bodies — one before, the other behind us.

We seated ourselves at the well, and made the night musical with our discourse of the loved ones at home. But how often has this atmosphere been defiled since it vibrated with the voice of the Son of the Father, uttering the sublime mysteries of spiritual worship.

We slept, John and I, in the town, in a miserable hole, surrounded by half-a-dozen Greek Christians and some thousands of fleas. The night was, in brief, hideous. In the morning we went to see the synagogue of the Samaritans, of whom a miserable remnant yet worship God in the city of their fathers. A queer old man showed us an old book, which he said was in the autograph of a grandson of Aaron — though his voice was so cracked and his Arabic so poor (or so good) that perhaps we misunderstood it: it is probably he said — a grandson of Adam. An incredible antiquity is claimed for it, and *non credo.*

We breakfasted with our friends—stewed chickens, stewed mutton, a capital loaf of bread, an omelet, and coffee that was fit drink for Mahomet himself. Then we rode over to Samaria, a gay cavalcade.

The city of the Kings of Israel is almost gone. A few relics of its ancient splendour remain, especially long rows of columns, running half-way around the lofty bluff on which the city stood, and marking, perhaps, the line of one of its most splendid avenues. A ruined gateway at the western extremity of this row of columns, looking out to the distant sea where the ships of the world ride in the wind, and the mariners of nations lately born laugh at the faded splendour of the city of Omri.

No need that I should point out to you the passages of Holy Writ which we read on the hills of Samaria — prophecies that have had their literal fulfilment a thousand years. You know, or ought to know, them all.

The modern Samaritans are a fierce and furious race of men. They surrounded us with demands for money before we were fairly out of the city, and when we paid no attention they grew insolent. As we rode out of the place, a tall fellow attempted to seize the bridle of John's horse. John pressed the animal with his knee, and at a leap brought himself within reach of the scoundrel's skull. I heard a dull heavy blow, and saw him go reeling down. Then a cry rose that rang through the village. We put the ladies under Hassan's charge, and they plunged rapidly down the steep hill side, while we guarded the pass against the advancing villagers. We three were a host in such a case. We argued the matter a moment, until a stone came from the crowd

and struck John's horse somewhat heavily. He replied with a ball from his revolver, aimed at the man who threw it, but missed him. It was as well, for the crowd scattered in a twinkling, and left to us the field. As we descended to the plain a gun was fired from a loop-hole in the old church of John the Baptist, now a mosque. We sent three balls against the walls, and then Samaria was silent. D. T.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary Meeting of the above Society was held on Tuesday, the 1st instant.

The Lord Chief Baron Sir Frederick Pollock, President, in the Chair.

The minutes of the last meeting were read and confirmed.

The Viscountess Jocelyn, Frederick J. Smith, Esq., Capt. Rooke (Scots' Fusileer Guards), F. Joubert, Esq., Braham La Mert, Esq., Alfred Read, Esq., and C. Silvi, Esq., were duly elected members of the Society.

The Secretary read a letter, signed "One of the Collodion Photographers," from which we extract the following:—

"Pray, sir, stir up the profession to an act of bare justice! Enriched by Mr. Archer's invention, surely we shall feel a pleasure in sending his children into the world in a position equal to that which they might have attained had their father followed his original profession. Surely we are strong and numerous enough as a body, professional and amateur, to support three little children! £50 per annum for each child would probably be sufficient to provide them with a first-class education, so that £100 per annum would be wanted in addition to the Government £50. This amount could be raised at once, if 200 photographers would subscribe 10s. each per annum, or 100 photographers £1, 1s. each; but I should think there must be in Great Britain more than 200 well-to-do photographers, who owe their present gains mainly to the discovery of the late Mr. Archer.

"I have at present seven photographic businesses, each yielding a certain amount of income, and will therefore subscribe seven half-guineas or guineas per annum, during the next 10 or 15 years, if 200 or even 100 photographers will also subscribe a half-guinea or guinea per annum. For my own part, in rendering to the children so small a homage to their father's memory, seeing I cannot give them back their father, I should look on the money each year as a payment—a poor payment—a *very* bare act of justice.

P.S.—I forgot to say that I would propose not to touch the money now invested, but let it accumulate as capital to be divided among the children when they become of age."

The Secretary mentioned that the writer of the letter had communicated his name in confidence.

The Chairman stated that he regretted there was no paper to be read at this meeting, and announced that there were two or three gentlemen who had promised to make communications at the next meeting, one of whom was Mr. Ennel, and then asked if any member had any oral communication to make to the Society.

Mr. Roger Fenton said he saw many gentlemen present who no doubt had been working hard during the recess. Before they parted after the last meeting the question of lenses occupied much attention; and, to commence a discussion, he would state that he himself had been working wiih three of Ross's orthographic lenses, and comparing them with others of the old form by the same maker, he (Mr. Fenton) felt bound to confess that for landscapes he preferred the old combination. He had tried the orthographic lens for *portraits* and for *copying*, and in the latter application found that if the picture were not too large the lines were certainly very correct; but in forcing the lens to cover a surface beyond that which it was legitimately intended for, as is frequently necessary for landscape work, the distortion of the lines produced by the orthographic lens was more offensive than that by the meniscus form.

It also had the great defect that it would not give the foreground and distance with anything like a sharp definition. There should be a certain limit for distance, within which every object might be rendered comparatively distinct, and with the orthographic lens he could not get sufficient *depth of focus* to satisfy him as an artist. If by using a small stop any one had been able to produce satisfactory results, he (Mr. Fenton) would feel obliged by his communicating the result of his experience to the Society.

There had been a lens constructed by Mr. Sutton which had been said to produce great results; perhaps if any one were present who had been working with such a lens, he would favour the meeting by a statement of his opinion respecting it.

Mr. Bedford had employed the orthographic lens very little this summer, because when he had previously tried it he found that it possessed very few, if any, advantages over the old landscape combination. There might be some advantage in rendering architecture, and in other cases where there were flat surfaces, with less convergence of the vertical lines. For landscapes, in his opinion, the old form of lens was decidedly the best, both in depth of focus and in sharpness. The same result might be obtained by the orthographic lens; but in order to accomplish it the lens must be "stopped down" to such an extent as to make the increased time of exposure become of serious importance.

Mr. Shadbolt thought it advisable, in a discussion on lenses, first of all to determine what are the qualities required in a landcape lens? Then they would be in a condition to judge whether operators had conducted their examinations in such a manner as to allow of lenses of different construction being fairly compared the one with the other.

There were certain qualities in a landscape lens which might be regarded as absolutely essential:—fair correction of the spherical aberration to insure good definition was one; absence of all but a moderate amount of distortion was a second point. With regard to rendering foreground and distance both tolerably perfect it seemed to be forgotten, or not understood, that it is a question of *actual* and not of *angular* aperture—the reason being sufficiently evident; for with *any* construction of lens a large aperture in use is equivalent to taking a picture from *two or more points of view*, and superposing the results, thus introducing a painful amount of confusion, because objects in the foreground, if viewed from opposite side of a large aperture, would eclipse *different portions* of the distance. This was a fact that could be verified by any one, whether acquainted with optical science or not.

In delineating flat objects, or those situated nearly in one plane, the preceding observation did not apply, as *angular and not actual* aperture would be that subject to limitation. In near and distant objects delineated by a lens with an aperture of two-and-a-half inches, a confusion would ensue to the extent of the superposition of the picture seen by the right eye upon that by the left, or, in other words, equivalent to that of placing a pair of stereographs one upon the other.

He made these remarks because he perceived there existed a little confusion of ideas upon this point. To compare a lens of large size and long focus with one of small size and short focus required certain allowances and conditions of operation to be fairly adjusted.

With regard to the orthographic lens he thought there was one point which had been overlooked by Mr. Fenton in his statement. In noticing that the foreground was not well rendered by it, he did not state whether he had used a camera with a swinging back: certainly without it, when an orthographic lens was employed, to delineate a foreground with moderate distinctness as well as distance ought not to have been expected. One of the principal uses of the orthographic lens was, that with regard to architectural subjects, the photographer could rarely get to a sufficient distance from the object to include the whole properly on his plate. It was very curious that the defect of that lens could, in such cases, be actually turned to account. It was well known that parallel vertical lines, copied with an orthographic lens, curved with their extremities diverging from each other. In taking a square tower with a camera looking upwards, furnished with an ordinary lens, a cone would be produced; but as an orthographic lens, if placed horizontally, would cause the upper part to appear wider than the centre, so by directing it somewhat upwards (a great convenience when space is contracted) the lines would then become again nearly parallel.

There was also one advantage which he did not recollect to have been hitherto noticed—that by removing the back combination of an orthographic lens and reversing the position of the remainder, an ordinary landscape lens was produced of much shorter focus; so that by procuring an orthographic lens, two lenses were in effect obtained, one of which could be applied to a small camera, which was sometimes a convenience when away from home.

The Secretary stated that he had received a letter from M. Joubert, who had that evening been elected a member, and who had invented a new mode of printing which he termed "Phototype." M. Joubert stated in his letter that he had obtained a result which he would show if Dr. Diamond would pay him a visit. He (the Secretary) had seen the result, but M. Joubert did not describe the mode of production. The inventor also says he will present to each of the subscribers of the *Journal of the Photographic Society* a specimen proof, to which end he will at his own expense supply

the Society with three thousand prints in time for distribution with the ensuing number of the Journal. Copies from original engravings or from the life can be produced in large numbers, quickly, and at a very cheap rate — in fact a very large number were able to be taken off in a few hours.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The Annual Meeting of this Society was held on the 2nd instant, at the House of the Literary and Philosophical Society, 36, George Street, when Mr. Sidebotham presided.

Mr. Mann, the Honorary Secretary, read the Annual Report of the Society, of which the following is a copy:—

ANNUAL REPORT.

The Council of the Manchester Photographic Society, in presenting the Annual Report for the past year, have great pleasure in congratulating the members upon the satisfactory state of the funds, the Treasurer's Accounts showing a surplus of £29, 14s. 3d.

The number of members during the past year has not been so great, but it is hoped that there will be a considerable increase this session.

During the past year the meetings have been well attended, and the attention of the members has been principally occupied by general and very interesting discussions, upon the merits of the various processes and other discoveries in photography; and numerous apparatus have been exhibited to the members, comprising the latest inventions and improvements. Mr. Dorrington read a very interesting paper on printing glass transparencies, the results of numerous experiments made by himself and Mr. T. H. Nevill.

The Report of the Committee appointed to experiment on the various keeping processes was laid before the Society early last session, deciding in favour of the Taupenot or collodio-albumen process, as being the best process discovered for landscape photography.

At one of the meetings, Mr. Dancer brought an improved lantern with achromatic lenses, and the requisite apparatus for exhibiting transparencies, a great number of which (the production of the members of the Society), were shown upon the screen, making a very interesting exhibition, and enabling the members to judge of the kind of transparencies best suited for the lantern.

Mr. Sidebotham made some remarks on micro-photographs, claiming for our member, Mr. Dancer, the originating of these beautiful productions, and brought forward letters and specimens proving beyond a doubt that such was the case.

A large number of very excellent photographs have been presented by the members to the Society's portfolio during the past session, the same forming now a valuable collection, and constituting a very interesting record of the progress made by our Society in the photographic art.

Perhaps the most curious discovery made during the last year was that by our member, Mr. Young, that plates prepared and exposed can have the soluble iodide removed, and then be developed by daylight. Mr. Young's experiments have been repeated and verified by several of our members and also by members of the French and other photographic societies, and several theories put forth on the subject; but we are not aware that any practical use has been made of this curious fact: it would be well if some of our members would take this matter up, and carefully experiment upon it, so as to make it somewhat more than a mere photographic curiosity.

The year that has passed is not remarkable for any great discovery in photography; but rather for the effort made to perfect the processes already known. The dry processes, as they are generally called, have been much attended to and improved upon, and the ground cleared from many of the so called new ones; and from the letters in the journals and other sources, it appears that the decision of the public is in accordance with the report of our committee appointed to examine the subject, viz., that the collodio-albumen is in every respect the best dry process. One matter of considerable importance has been made public during the year, by an anonymous correspondent of the *Journal of the Photographic Society*, Number 82, page 258, and subsequently verified by Mr. Hannaford and other members of the North London Photographic Association, viz.—that plates prepared with nitrate of silver, and then dipped in a solution of chloride, so as to reduce all the pure silver to a chloride, are still in a high degree sensitive to light: this rather interferes with some of our previous notions, and opens quite a new field of experiment. Some of our members have been experimenting in this direction with different degrees of success: the results will no doubt be laid before our Society during this session.

The paper printing process is at last, thanks to Mr. Hardwich and Mr. Maxwell Lyte, now on a proper basis. The alkaline toning baths appear to satisfy all requirements; and although time alone can be the true test, there is every reason to believe that prints carefully prepared and toned by these processes are permanent, and it is to be hoped that photographers generally will at once discard the old toning baths. Carbon printing appears to be almost forgotten: some prints produced by our members were better than any we have seen by the originator of the process; but the difficulty, uncertainty, and unsatisfactory nature of the results, in comparison with silver prints, has caused the process to be laid aside.

Several specimens of photography applied to engraving and lithography have been published in the journals during the year: they are curious in a scientific point of view; but if as we suppose, they are to be taken as good specimens of the process, they are yet far from equalling engraving by hand for book illustration, or photographic prints for the portfolio.

Our report would be incomplete were we to omit to refer to The Photographic Journal, the special organ of our Society, and to thank our worthy Editor, Mr. Shadbolt, for the interest he takes in calling attention to any matters of importance brought before our meetings.

The Honorary Secretary then read the Treasurer's accounts, when it was unanimously resolved that the report and accounts be approved of and adopted by the meeting.

The President called the attention of the members to the subject of the election of the Council for the present session. He said there was no definite rule as to the way in which the election should be conducted, and thought it would be as well for the members to come to some resolution as to the manner of conducting the future elections He was himself in favour of a general ballot; but as they were not prepared that evening with any lists of the members of the Society, the Council had prepared a list of the names of the Council they recommended for the present year. If any member wished he could offer objections to any or the whole of the names if he thought proper, and move any amendment to the same.

After being proposed and seconded, the list was unanimously agreed upon by the meeting.

The following are the names of the Council elected for this session:—

President.

The Lord Bishop of Manchester.

Vice-Presidents.

Joseph Sidebotham, Esq.
J. B. Dancer, Esq., F.R.A.S.
James P. Joule, Esq., LL.D., F.R.S.
Arthur Neild, Esq.
H. E. Roscoe, Esq., B.A.
W. C. Williamson, Esq., F.R.S.

Council.

The President,
The Vice-Presidents,

Mr. J. Compton, Jun.	Mr. T. H. Nevill,
„ Samuel Cottam,	„ A. Patterson,
„ J. Dale,	„ John Parry,
„ J. Dorrington,	„ J. J. Pyne,
„ G. Higgins,	„ F. Töbler,
„ G. T. Lund,	„ H. Young,
„ T. Mabley,	„ S. W. Williamson,
„ James Mudd,	„ G. Wardley.

Treasurer.

Mr. Edwyn Offer.

Honorary Secretary.

Mr. Edward Mann.

The thanks of the meeting were then voted to the officers for their services during the past year.

A resolution was then agreed to by the meeting that the annual meeting be always for the future held on the first Wednesday in October. It was then moved and carried that four of the Council who have attended the least number of council meetings retire annually from the Council, and that they be rendered ineligible for re-election during the next year.

After a general discussion as to how the Council should be elected on future occasions, a resolution was passed as follows:—"That a list containing the names of the members of the Society should be supplied to each of the members, and that each member mark the names of those he wishes to be on the Council."

The President then made a suggestion that, as the funds of the Society were in a very satisfactory state, he thought it might be desirable to reduce the amount of the subscription to half-a-guinea and half-a-guinea entrance fee, when, after some discussion, it was formally resolved upon and carried.

One of Mr. Sutton's new symmetrical triplet lenses, was exhibited by Mr. Pyne, which the President explained, and stated the manner in which he had tested its capabilities, and that he was considerably disappointed with it — much light being lost, a very small field given, and no very sharp focal point.

Mr. Dancer made some comments upon experiments he had made with Ross's orthographic lenses, and said he had found the lenses gave very different results by varying the distances between the lenses; he also thought a lens should not be judged of by

simply examining the picture on the grey glass, but that a photograph should be taken in order to form a correct opinion.

Mr. MABLEY said he thought dry plates were not so accurate as wet collodion for testing the quickness of a lens, as a picture under-exposed might often be fully developed by a dry process.

Mr. DANCER agreed with Mr. Mabley, for he had noticed that pictures taken on dry plates in a stereoscopic camera with twin lenses and different apertures often showed a very slight difference when developed.

The PRESIDENT then explained several instances where dry plates had been accidentaly exposed for a very few seconds, and yet traces of the picture were found mixed up with the after-exposed picture.

Mr. WARDLEY stated several similar cases which had occurred to him.

After a vote of thanks to the President the proceedings closed.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of the above Association was held on Wednesday evening, the 9th instant; Mr. ROGERSON in the chair.

After reading the minutes of the last meeting, which were confirmed,

Mr. JOHN HEYWOOD read a paper *On Toning Positive Prints.* [See page 282.]

A very interesting discussion followed. The meeting considered the No. 2 solution the most approved.

Mr. WARDLEY said they all knew the result of the old toning bath, and he should like to know how these prints were affected by lapse of time. He was of opinion they would remain as they were.

Mr. LLOYD then exhibited a very neat apparatus for copying a picture by gaslight. It consisted of a quarter-plate camera, elongated, to which a lens and a tin cone were fitted to the mounting, over which was a semicircle of gas tubing, perforated. This was fed by a flexible tube from a common gas-burner. The apparatus would copy a picture in from eight to twelve minutes. It was thought the best contrivance yet exhibited, as the light was uniform, and could be used by day or night.

Mr. WARDLEY exhibited a frame for printing transparent stereographs from an uncut negative, invented by Mr. Compton.

Mr. HOOPER exhibited an amusing toy for photographers' use, to froth albumen and please the children: when the frother was turned a dancing figure expanded. This caused much amusement.

A vote of thanks to the chairman concluded the meeting.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VI.

WATER COLOURS.

Preliminary Observations.

ALTHOUGH we are now fairly afloat in our practical studies, you will not, as I have before said, derive much benefit from my instructions if they are merely confined to material colours, their uses and modes of application. In its place I have already spoken of the relative value of colours, of their effects in combination, their characteristic peculiarities, &c. (see the chapters on colour and pigments). I must now say a few words upon the proper perception of colour in nature.

It is so common in observing the various objects about us to take for granted certain general ideas as to their respective colours that a more thoughtful habit of perceiving is one of the first and most important qualities to be acquired by the student. As he learns to see artistically, and catch

> Those tend'rer tints that shun the careless eye,

he will experience no surprise at the raw, crude, unnatural appearance presented by his early efforts, nor any longer feel at a loss to account for such failures.

The education of the eye *must* accompany that of the hand, or all my efforts are vain, and all the time you may spend in reducing these instructions to practice will be so much of man's most precious gift wasted.

The best means of acquiring what is familiarly known as "an eye for colour," is by the careful and thoughtful observations of every object around you, and the study of such paintings * as are celebrated for their colouring — not the first without the last, nor the last without the first, but *both* — not slightly, briefly, and at long intervals, but deeply, lingeringly, and frequently. You must be thoroughly in earnest or you will fall into that mechanical drudgery, something better perhaps than house painting, but infinitely less respectable, and far, very far below anything artistic. There is no medium.

There are unfortunately those who *will* preach that old-fashioned, pernicious doctrine that "artists are born and not made" — whose mischevious appeals to egotism, idleness, and ignorance, find with the many too ready a hearing. Some hug it to them because it flatters their vanity — *they* are "the chosen of the earth;" others because it is a salve to their consciences for procrastination — "Oh! I can do it in no time, when I like; there's no hurry." Others, again, because it is an excuse for failures, due only to a want of energy and perseverance. To refer to a quotation already given in my maxims:—"There is a degree of impiety in pleading a want of faculties, when the real want is proper industry and method to make right use of them." Labour is the only price of excellence in every department of our knowledge, and if you are prepared to pay this price, and come to your work with a bold heart and patient love, I will guarantee you a measure of success fairly proportionate to your efforts. It would be easy to illustrate my opinion on this subject by reference to the lives of eminent painters, but it would lengthen my digression too seriously. Believe me, I do not speak ignorantly, but like that amiable young-old gentleman in "Bleak House," from "the deep wells of my experience." Without being controversial or disputative, I desire to deal honestly with you (as a guarantee of this intention I appended my name to these papers), and this should not be, did I fail to warn you against this pretty piece of fanciful theorising which age and popularity has rendered so mischevious, as this theory of providential partiality certainly is. A predisposition for the study of art may have its origin in peculiar circumstances connected with early life; but with average intellect, manly courage, and a more than ordinary share of perseverance, I can see no reason in nature why victory should not crown the "good fight."

To return. If you possess a photographic camera, examine the image of any object or person in sunshine upon the ground glass, and mark well the wondrous brilliancy of the mysteriously-blended tints and colours; or the countless variety of shades and tints which go to make up that which the uneducated eye recognises, in a misty indefinite idea, as "flesh colour." *Such images are capital studies.*

When you examine paintings, optical images, or the realities of nature, bring to the task the principles of art, which have been discovered or supported by the great artists of past ages, and *test their value for* yourself — *humbly* yet *boldly*, for there is no real energy, no true perseverance, without *conviction. The traveller who is conscious that he knows the right road travels quickly; but the wayfarer in an unknown path goes with slow, hesitating steps, and is often brought to the extreme verge of the gulf — despair.*

In studying from pictures, beware of indiscriminate imitation, and never copy the style or system of any one master until you have carefully matured your own judgment on his productions.

That you may not, with many, think it an unconquerable disadvantage to colour upon the photograph, I must remind you that most of the great old masters, and many of our best modern painters, completed their pictures in monochrome before they coloured them. This fact has been vouched for by very high authorities. * My friend, Mr. H. Keens — himself a most excellent colourist — in a little MS. work upon this subject, says: — "Titian frequently commenced his pictures by painting them entirely with black and white, thus satisfying his eye with the *chiaroscuro* of his work previous to applying colour. Photography now furnishes the artist with images possessing the most beautiful gradations of light and shade, quite equal to the black and white paintings of that prince of painters; and, if he can bend his proud scorn of the humble camera to accept its valuable aid, he has now fair scope for emulating that great master, and may advance modern art to an equality with the best productions of his predecessors."

I am afraid that Titians are not very easily "made" by any process, but I do believe that artists who can devote their whole energies solely to colour, will by-and-bye greatly surpass those the greater part of whose life and nearly the whole of whose best energies are swallowed up in the study of correct drawing, in light

* See maxim No. 12.

* Sir J. Reynolds, Merimee, Field, Mr. T. Sheldrake, and many others. The fact is also supported by the discovery of unfinished pictures and the examination of damaged ones by Van Eyck, Perugino, Leonardo da Vinci, Fra Bartolemeo, Guido, Rubens, Raphael, Titian, and others.

and shade; for so deep and subtle a subject is that of colour that it is not easy to devote to it too much time.

With these few preliminary remarks by way of advice and encouragement we will enter upon our lessons in water colours.

The method of execution adopted in water colours varies with almost every artist who uses them, I shall more particularly recommend that species of manipulation with which I am most familiar.

The first thing to be done is to select

MATERIALS.

Brushes for water colours are prepared in hog's-hair, camel's-hair, and sable, in quills and in tin ferules: some are long and tapering, others short and thick, some flat, others round. The hog's-hair brushes are of service in the use of body colours to lay broad, flat tints, the camel's-hair for large washes of colour; and the sable for the finer work, for which also select the best French sables. Sable pencils are dark brown and light red in colour—the former are the softer and the latter the stronger kind. With the exception of such pencils as are necessarily very small, for the putting in of minute markings and outlines, choose as large a brush as you can conveniently work with, as by so doing you obtain a full, broad touch, infinitely superior to the "scratchy effect" caused by the use of those too small and fine. When purchasing pencils, ascertain in the first place that the hairs are of a proportionate length, then dip their ends in water, work them to a point on your thumb-nail and ascertain if it forks or divides, and see whether, after pressure, it springs back to its original form; if thus tested, and it neither forks nor fails in its elasticity, it is a good and valuable servant and must be retained. A flat camel's-hair brush or two should be procured for washing and sizing. Be careful not to leave them in the water, and rinse them from colour before putting them aside. A stiffish brush, somewhat worn at the point, is best for "hatching."

The author of the preceding paper has, in order to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

Miss D. (Kingsland)—The background I recommended in a previous number must be painted with more turpentine than oil, in order that it may dry with but little gloss. In a carefully manipulated negative its effect for transparency and softness cannot be excelled. Do not place it too near your sitter.

Alabastrino—As your question does not bear directly upon my province, I ought, doubtless, to hand over your epistle to the editor for its reply; however, I will break a rule to say, that such productions have the certainty of destruction in their very elements. If preserved carefully, and excluded from light, they may—and do—last some time; but even then you will find them vary in appearance with the state of the atmosphere. I am proud to own acquaintanceship with Mr. G. W. Simpson, but never heard him claim the invention of these pictures—nor do I think this gentleman has ever publicly stated that they would be found, "under all circumstances," perfectly permanent.

John Blunt—It is a good print for colouring, but it is spoilt beyond the hope of recovery for water colours, by an abominable "French background"—one of the most inartistic and tasteless of photographic blunders. What would you say of an artist who cut out the figures from his water-colour sketches to stick them upon a piece of stained paper? The *painter* who did this would be laughed to scorn—and why should not the *photographer?* By another proceeding he produces results *exactly similar:* he cuts out his "dummy," and lays it over his printed figure to protect it, while the hitherto protected background, in its turn, is exposed to light; and thus *two hard edges are brought into contact,* leaving a *black* or a *white* outline of more or less distinctness (according to the operator's skill—but always horribly distinct), quite round the figure, causing that which would otherwise appear the gently retiring boundary of vision to seem like the sharp palpable edge given by scissors, which, in fact, it is. I did hope such childish inventions had vanished before the increasing spread of correct taste and good sense. Another reason against these backgrounds will be found in the fact, that flat smooth surfaces *advance* instead of retiring, as all behind the principal figure should of course do. Care and cleanliness will always command at least a passably clean background; and if in the print you find white spots, a fine brush, with a little colour, will enable you to "touch them out." Should the spots prove black, touch them out in the negative with opaque colour, that they may be white in the printed positive. I can only advise you to get another print, for however streaky or spotty its genuine background may be, you will find less trouble in painting these defects out than in destroying the harsh black or white line round the image.

A School of Design-Student—Photographic colouring is, *in competent hands,* very remunerative. At present too many inferior colourists are engaged by photographers; but I believe the fact originates in the dearth of really artistic colourists. I can therefore honestly advise you to persevere.

M. Mansion—When refering to the use of dry colours, I asserted that I had never seen them applied with good effect to paper. I can scarcely regret having done so, as the fact promises to renew an acquaintance I had the pleasure of making some years since with the above-named veteran colourist. M. Mansion has shown me some exquisitely beautiful specimens of dry colouring on paper. My own practice on paper has been chiefly with water and oil, and the few experiments I once made on the same with dry colours did not encourage me to proceed, I therefore as fairly stated my convictions in the words above referred to, as I now do a fact on the other side.

J. P.—Although you may wish to study in water colours alone, I would not advise you to neglect the chapters already given. I cannot just now remember in which number they commenced. Begin with large heads, and remember Pope's words—

"———— Failing is no shame,
And cowardice alone is loss of fame."

A Drawing-Master—For dry colours size the print first, and varnish just as you would upon collodion. The pumice-stone powder gives a tooth to the surface.

Letters to a Young Photographer.

No. XXIII.

My dear Eusebius,

Let us return to business, and talk of processes, and methods, manipulations, and formulæ, as best suits your taste and curiosity. The man who can invent a new process superior to any we possess deserves the reward the monarch promised to him who could invent a new pleasure. What we appear most to want is a really infallible mechanical process; such as will suit those who are deficient in aptness, manipulatory skill, taste, judgment, and every other intellectual quality. We want something "adapted to the meanest capacity," like shuffling a pack of cards, or winding up a clock. I know a certain self-dubbed professor who could invent such a process if he were to set about it; but *he won't try!* Therefore the awkward squad of would-be photographers must bide their time, till the professor, moved by their sufferings, falls into the melting mood.

Let us talk of paper—waxed-paper, if you will, as that appears to possess great attractions in your eyes. You know that when paper is oiled or varnished it becomes much more transparent than before: to what this result is owing I shall not now attempt to explain, as the cause is much too recondite for your tender understanding. Well, then, oiled-paper is much too troublesome to operate with in aqueous solutions, obviously from their mutual repellent qualities: waxed-paper is much less so, therefore we employ wax to embue our paper with, and render it translucent, and tougher, or parchment-like. If the paper be selected of suitable quality, you may obtain negatives on waxed-paper which will yield positives as good, and some think even better, of many classes of subjects than those obtained from glass negatives. They are *softer*, that is, there is less sharpness, which in architectural subjects is a great advantage. The only objection to the waxed-paper process is, that it is slower than collodion or albumen; still, for architectural subjects it has become, in consequence of improved manipulation, quite quick enough for all reasonable purposes.

The principles of photography on waxed-paper are the same as those of collodion or albumen; the paper is substituted for glass, and the sensitising agents are applied direct to the surface of the medium instead of being mixed with a vehicle like albumen and collodion. The object is to obtain on the surface of the paper an even layer of iodide of silver, upon which the image is received and impressed, and afterwards developed by suitable agents. The methods of obtaining this layer of iodide are very numerous, but good results may be arrived at by those I shall now proceed to describe.

One advantage possessed by waxed-paper is, that it may be preserved in a sensitised condition for a considerable space of time; because the wax preserves the organic matter from the action of the salts of silver. The idea of employing this material is due to M. Le Gray (to whom we were very nearly being indebted for the collodion process), and it gave an immense impulse to photography; it was only eclipsed by the introduction of collodion. Many photographers continue to prefer the waxed-paper process, notwithstanding the advantages possessed by albumen and collodion.

The selection of the paper for this process demands the greatest care and attention. I have found Marion's papers the best, and as they are so readily obtained waxed, I think you had better avoid waxing the paper yourself, as it is a very difficult and troublesome operation to perform.

In un-waxed paper the nitrate of silver comes into immediate contact with the organic fibres of the paper, and decomposition ensues. In waxed-paper, on the contrary, the nitrate and iodide of silver are not in immediate contact with the fibre of the paper, which is protected by the wax, hence it remains much longer unaltered when sensitised; and it is probable that if we could impregnate paper with some substance that would render it as impermeable as glass, it is possible we might obtain a sensitive surface which would retain its sensitiveness unchanged for an indefinite length of time. We arrive very nearly at this result by M. Gaumé's method of impregnating paper with a solution of gutta percha.

You cut your waxed-paper a little larger on one of its sides than the frame of the camera slide, and iodise it in the following manner: — Take

Clarified serum of milk	11 ounces.
Iodide of potassium	2 drachms.
Bromide of potassium	30 grains.
Sugar of milk	$2\frac{1}{2}$ drachms.

This bath will not keep long, especially in warm weather, as the serum enters into a state of fermentation. When used it must be filtered into a dish, and the paper floated upon it, and by means of a glass triangle remove all the air bubbles that may form. It will be difficult to moisten the waxed-paper at first, but by keeping it immersed the iodide of potassium gradually overcomes the resistance of the wax, and the iodide covers the paper uniformly. Without the addition of the sugar of milk the difficulty of imbuing the paper with the iodide would be still greater.

The waxed-paper must be left in the bath from half-an-hour to two hours, or until the paper is thoroughly penetrated with the solution; it may then be suspended in a warm room by one angle to dry, attaching a piece of bibulous paper to the lower corner to facilitate draining.

The waxed-paper upon being taken out of the bath will be found quite altered in appearance; its transparency will have dissappeared, and its colour is frequently changed by the action of a small quantity of free iodide. The change in appearance is due to the action of the iodide upon the wax; it appears to have become porous or spongy. But it is only the physical condition of the wax that is altered; upon warming the paper before the fire the paper resumes its primitive aspect.

Exposed to the light the paper assumes a violet hue, which, however, is of no importance, as it disappears when the paper is passed into the sensitising bath. The sheets must however be kept in a close portfolio, out of the influence of air and light, else the iodide will become decomposed. The paper will, if properly protected, keep in good condition for an indefinite length of time.

The paper is sensitised when required for use, by floating on a bath of aceto-nitrate of silver, composed as follows: —

Distilled water	1 pint.
Nitrate of silver, pure,	$1\frac{1}{4}$ ounce.
Glacial acetic acid	1 ounce.

Have ready, side by side, three perfectly clean porcelain dishes which have been employed for no other purpose. Into the first pour a sufficient quantity of the aceto-nitrate of silver, filtered, if necessary, and nearly fill the others with distilled water. Have also a quantity of coloured bibulous paper, cut into squares a little larger than the sheets of prepared paper. Then carefully immerse each sheet of waxed-paper in the sensitising solution, and by means of a glass triangle remove all the bubbles of air as they form. However much discoloured the paper speedily becomes white in this bath, and in one or two minutes the reaction is complete. Then take a pair of horn pincers in each hand and lift the sheet of paper by the two opposite corners; let it drain, then put it into one of the dishes of distilled water, move it about gently, and then pass it into the next dish of water to rinse it. Lift it out and let it drip for a few moments; then place it on a folded sheet of bibulous paper, cover it with another, and absorb all the superfluous moisture. Then put it on a fresh sheet of bibulous paper, cover it with another, and place upon the latter the next sheet of sensitised paper, alternating with bibulous paper, so as to make a pile: this done, place a piece of wood larger than the paper on the top of the pile, put a weight upon it and leave the whole until dry; the sensitive paper will come out perfectly flat, and not curl, unless it be placed in a very warm place.

If you prepare more than six or eight sheets at a time, the water in the dishes must be renewed, and the blotting-paper dried, or a fresh supply obtained. This sensitising operation must be performed in the dark room by artificial light. The proofs obtained from the paper first sensitised in this bath will exhibit very pure whites and blacks; but they will be less sensitive and perhaps less harmonious than those subsequently prepared, which is as much as to say that an old bath is better than a new one. The effect may be obtained by dissolving one ounce and-a-quarter of nitrate of silver in three ounces of distilled water, and adding to it, drop by drop, a small quantity of the iodide of potassium-bath, stirring meanwhile; a yellow precipitate forms, which is iodide of silver; then add the remaining seventeen ounces of water and the acetic acid; filter, and preserve it in the dark; it is then ready for use. The paper should not be allowed to remain in the nitrate of silver bath more than one or two minutes at most, just long enough to convert the iodide of potassium into iodide of silver, otherwise the nitrate of silver is apt to extend its action to the paper itself, and decompose it, notwithstanding the repeated washings we may submit it to: the sensitised paper rapidly darkens and even blackens entirely in the gallic acid. If the paper is removed from the sensitising bath at the proper moment it will keep in good condition for several days, and better endure a prolonged development. But it is preferable to expose the sensitised paper in the camera as soon as possible after it is sensitised.

Photographic Glossary.

Varnish—A substance which, being spread over any surface, covers it with a sort of glassy coating, impervious to air and moisture, against which agencies it is the object of the varnish to protect the body to which it is applied. It also imparts gloss, and heightens the colour, and as in the case of wood, developes all the beautiful details of the grain, &c. The substances used as varnishes are very numerous: they are white of egg, wax, gum-arabic, and numerous resins dissolved in various menstrua. Varnishes proper consist of certain resins dissolved in fixed oil, as linseed; in essential oil, as turpentine; and in alcohol, forming respectively oil varnishes, turpentine varnishes, and spirit varnishes.

In the alcohol and turpentine varnishes the menstruum entirely evaporates, leaving the resin in its original condition. In the oil varnishes, on the contrary, the menstruum does not evaporate, but becomes oxidised in the atmosphere, and resinous, entering into intimate mixture with the resin dissolved in it, and greatly modifying it.

In photography we are chiefly concerned with the spirit varnishes, and in forming them our chief attention must be given to the resin; for obviously, in varnishes of this class, the quality must entirely depend on the nature of the resin. If the resin be brittle and pulverulent before it is dissolved it will retain those qualities after the alcohol has evaporated. Again, if the resin be unctuous and soft, it will produce a sticky varnish, and dry but very slowly. By a judicious mixture of various resins, whose opposite qualities modify each other, a varnish free from objectionable properties may be obtained.

Varnishes—Spirit—Most of the resins are more or less soluble in alcohol, in proportions depending upon the strength of the spirit. A specific gravity of 0.825 is of very convenient strength. The most important resins are animé, benzoin, dammar (or soft copal), elemi, mastic, and lac (bleached or white lac). Upon examination in their natural state, these resins exhibit very different properties. Some are covered with a whitish dust or powder, showing that they are easily pulverised, as the powder arises from the abrasion of the pieces against each other: such are sandarach and dammar. Varnishes made of these resins alone are very easily scratched, and will bear but little abrasion. Mastic is more tenacious — it softens in the mouth, becoming plastic, while the others are brittle between the teeth. Elemi and animé are more tenacious than benzoin. Lac is hard, tenacious, non-pulverulent, and not easily abraded or scratched; but it is apt to scale off the glass to which it is applied: it therefore requires to be mixed with dammar and elemi resins, to supply deficient qualities.

The formulæ for varnishes may be infinitely varied, according to the qualities of the resin taken as the basis. It may

require the addition of a pulverulent, or brittle, or unctuous resin to correct its defects. The addition of these must respectively depend upon the object and judgment of the varnish maker. As a general rule, alcohol sp. gr. 0.825 will dissolve about one-third of its weight of a resin, but dammar dissolves as much as seventy-five per cent. The resins are not always completely soluble in alcohol: a mucilaginous or gummy portion frequently remains in suspension, and the soluble portion must be filtered out. The addition of spirit of rosemary to the alcohol increases its solvent power. Chloroform produces a similar result.

Foreign Correspondence.

Paris, November 10, 1859.

The 18th of July next promises to be a very interesting epoch for celestial photographers. The total eclipse of the sun on that day will not, unfortunately, be visible in this latitude, the nearest favourable point of observation will be Spain, from Bilboa, Santander, and Oriedo to Tortosa, Oropesa, and Valencia, where there will doubtless be a great gathering of European astronomers from England, France, Italy, Germany, and Russia, besides those of Spain. Astronomers are already busily engaged in calculations, and it is noted that at the time of the eclipse the four principal planets, Venus, Mercury, Jupiter, and Saturn, will be visible in the neighbourhood of the sun, forming a sort of rhomboid; a combination so rare, that many centuries will elapse before it can occur again. Not until 1887, twenty-seven years hence, will there be another eclipse of the sun visible in Europe at all comparable with that of July next. The photographer will require lenses of 50 feet focus, and the chief point to which his efforts will be directed are the obtaining a series of proofs of the luminary between the first and last contact. M. Faye has made some valuable suggestions on the points of observation that demand most attention, and of the means of obtaining them. His suggestions to the photographer are, that at a minute previous to total obscurity, the camera being properly directed towards the sun, that in place of a sensitised plate a band of sensitised paper be unrolled at the rate of about three quarters of an inch per second. So long as the sun's rays are visible the paper will be darkened; but at the moment of the disappearance of the last ray of light—of that sudden transition from day to night characteristic of total eclipses—the photographic impression will suddenly cease. During the darkness several yards of the paper unrolled will, of course, be lost; but the re-appearance of the first solar ray will register itself by its photographic action. The apparatus must be furnished with a counter, in order to measure the time that elapses, which must also be registered on the sensitised paper: this may be done by means of a pendulum, which can be made to intercept the rays of light from second to second. The exact progressive variation in the light can thus be accurately estimated.

At present the photographs of the sun, moon, and planets, are, notwithstanding their importance, only portraits. Those obtained by M. Quinet have established the following results:—

1. We can determine the hour, photographically, with the meridian telescope, without the aid of an observer, with a precision at present unattainable in any observatory.

2. On the proofs obtained with a lens of long focus we can measure the smallest spots in the sun, and their variations, and thereby give an unlooked-for extension to the physical constitution and rotation of that planet.

3. We can observe an eclipse photographically, by which we gain an advantage over every attempt hitherto made to measure the size or the orientation of the horn, the depth of the phase, &c.

In registering contacts photography will eventually supersede the observer, and suppress, with him, all the sources of error so mysteriously allied to the physiological condition of our senses.

The interest attached to the forthcoming eclipse cannot be overrated, and it is hoped, that by a combination of resources, ample justice will be done to the rare occasion. From atmospheric causes the total eclipse of the sun which took place last year was, photographically, a disappointment. It is to be hoped that the season and the climate of Spain will be more favourable to the efforts of photographers.

I must commend to your attention M. Asser's improved method of carbon printing, which, if it prove at all successful, will solve that problem in a most satisfactory manner. It is the true desideratum, and we cannot but hope it realises what the inventor leads us to expect. J. P.

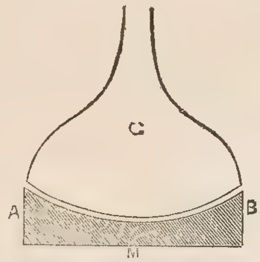
Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

ENLARGING FROM NEGATIVES.

To the Editor.

Sir,—I perceive, from your diagram, that I had not understood you in your former paper. Regarding the parabolic mirror, I took it for granted that the mirror you mentioned was to be placed with its axis at an angle of 45°. Now, in your diagram, which is quite explicit, the acting part of the mirror is a portion of the parabaloid on one side of its vertex; then, allowing it to be so, the upright outline B would be parabolic, while its transverse section would be circular.



Whether the figure be a sphere or parabaloid, it will reflect parallel rays to an imperfect focus; but as it is wanted only to illuminate the negative with *converging* rays so as to diverge after refraction by the lens, then the slight confusion at its focus is unimportant; and certainly on this point you are perfectly correct. Also, as regards printing, I find by experience that *direct* sunlight does not produce nearly such a fine picture as can be obtained by a good argand burner and powerful condensers; but the fault may be my own.

I am also of the same opinion as yourself that a spherical mirror would answer nearly as well as a parabaloid for the purpose of illuminating the negative.

Your proposed method of cutting the mirrors out of glass globes is quite practical and cheap. If, however, parabolic mirrors are wanted, there are several ways they can be made: first, when the glass globe is hot, to hang it up to elongate; secondly, a parabolic mould could be made, and the glass blown into it while hot.

I would suggest a parabolic mould, A B, of a square outline, proportional in size to the dimension of the mirror wanted, and of a parabolic concavity coinciding with that part of your parabolic diagram P X P in your Journal, page 254. Into this mould the hot glass could be blown, and a supply of cheap and accurate concave parabolic glass mirrors silvered as you describe.

You very justly observe it will be unquestionably advantageous, as in the first place we are quite free from chromatic error (however little it be); secondly, we are free from the great loss of light by reflection at four surfaces, and also from the imperfections, bulk, and weight, of the glass condensers; and thirdly, and not least, notwithstanding the superiority of the mirror, they can be supplied at a price within the reach of all. I am, Sir, yours, &c.

Newcastle, October 24th, 1859. THOMAS DAVIDSON.

A GROWL AT THE LAST MEETING OF THE PHOTOGRAPHIC SOCIETY.

To the Editor.

Sir,—I cannot resist the desire to vent a little good-humoured indignation at the character of the meeting of the Photographic Society last evening. On hearing the minutes read I was struck by the fact of the date—June. Now from June to November is five months, and during all this time not a single paper appears to have been prepared for the benefit of the members, though the room was full of gentlemen from all quarters! even the Chief Baron was there to grace the first meeting of the Society; and what was done? Six or seven members were balloted for, and then the announcement was made that there would be a paper read at the next meeting! and so the Society separated.

As to the attempt to get up a discussion about lenses, it signally failed. Now what does all this come to, but that the Council does not consist of *men of business?* What was the Secretary about? Surely if some of the members of Council or he had only spoken, there are many who love the art who would have been but too happy to have done something for the amusement and instruction of their fellow-members; instead of which, what a lame and impotent conclusion! I heard of one gentleman who had come some considerable distance, and had ordered his carriage about ten o'clock; but the meeting was over before nine.

I believe I express the feelings of most of the members, that these meetings are looked forward to with *great pleasure and expectation;* how great then must their annoyance to find meetings carried on like the last! nothing on the table, nothing even to raise a discussion upon—a bare board of green cloth! I should think that the instrument makers would have been glad to have paid, if necessary, for the privilege of exhibiting their newest devices and instruments. A few pictures taken by any new process, or stereoscopic views taken during the summer, would have been gladly sent if asked for. Either would have afforded something to look

at instead of the new ballot-box, which makes still more noise than the old one. Surely the ballot might be managed better: we want to hear something about PHOTOGRAPHY, not have our time taken up with listening to the sound produced by dropping the balls into the ballot-box, which constituted almost the entire amusement of the last evening.

Surely a sub-committee might be constituted for the sole purpose of arranging a pleasant meeting—by writing to members for papers, writing or speaking to instrument makers for specimens of apparatus and chemicals. If the Council cannot furnish such a sub-committee, let them get a few of the members to form one. In other societies one generally finds plenty to amuse and discuss. Look at the meetings at the Royal Institution, how the tables are covered!—look at any other public society, and then mark the contrast.

I really do not know where the blame lies, but if these things go on members will leave and get up another Society; in fact the last meeting was not respectful to the members. Why not mention in the last number of the Society's Journal that no paper would be forthcoming? I myself had been very ill and not quite recovered; but I braved the chance of a relapse to hear something about my favourite, delightful study, and great was my disappointment not to say indignation.

There was a great deal of annoyance expressed last session respecting the paucity of subjects. I hoped that during this one a more active spirit would prevail; but from the experience of the first meeting, what can one anticipate?—I am, yours, &c. AN OLD MEMBER.

November 2nd, 1859.

[We must admit that the meeting was anything but a lively one. No doubt our correspondent is under the impression that by sending us this letter he is giving us a sly rub, probably supposing that we are, as formerly, a member of the Council, which is not the case; but had we been on the Council, we should have published his very reasonable letter all the same.

The fact is, such men of business as are on the Council—and there are some good ones too—are outnumbered. In short, as we have before repeatedly observed, the Council consists of a ludicrously unwieldy number, which, in our opinion, should be reduced to *one-half*, or better still, *one-third* of its existing complement. If this were done, *each* member of it would feel himself personally responsible for the good management of affairs, and all would work with greater willingness.

In any revision of the laws which may take place this point deserves the first attention.

We do not at all agree with the policy of attempting to get up another Society; there is nothing amiss with the Society by our correspondent's own showing. The true remedy is to be found where indicated on a former occasion by our worthy President, whose words we quote: "If your Council acts in a way that you do not approve, remove it and appoint another."

Our own opinion is that most of the present members of Council would be efficient enough provided their number was sufficiently reduced. Should members generally agree in this opinion, there is plenty of time to give notice of such proposition before the next annual meeting.

In making these remarks—which we should however not have done but for our correspondent's letter—we have solely the welfare of the Society at heart: we have nothing to gain, but much to lose, by its injury.—ED.]

EUSEBIUS IN SEARCH OF A MASTER.

To the EDITOR.

SIR,—I am, as you are reminded every fortnight, a young—I might say a very young—photographer, learning my art from a letter-writer whose epistles appear fortnightly in your pages. Now, sir, "be judge yourself" whether or not I am to be pitied. Just as I had acquired an intense desire to proceed with fresh instructions—just as having found my "nerves strong" and my "head cool" enough to—coat a plate! and "take" my grandmother "*in*" the shadow of "the jasmine arbour," with her *tea-service* "BEFORE HER," and the favourite cat on the *opposite* seat (by-the-bye, the result wasn't satisfactory somehow — grandma looking grimly black, and barely visible in the shadow beyond the beautifully prominent tea-service, and Fido not to be found in the black patch under the table); just—to resume—as I had got one of the "best pictures I ever saw," and one which my teacher, "seriously speaking," pronounced so good as to draw from his generous heart the classical gift of a "penny meerschaum" and "four ounces of the best 'cnaster;" in short, just as I was getting on famously—my master ceased to teach photography, and took to the drawing and painting business, after insinuating that I had got another sense than the usual five, which, as he evidently didn't mean common sense, must of course be nonsense. Now, sir, I am naturally amiable; but, really—well, never mind. All I've to say is, Eusebius is in want of a photographic teacher, unless his old master will resume his instructions.

By-the-bye, may I also inquire if, as according to my teacher, only great painters are artists, what the little ones are? and if only great generals have a right to be called soldiers? or if only such men as Stephenson and Brunel are to be called engineers?

If the writer of the *Letters to a Young Photographer* should resume the instruction so abruptly deserted, will you, dear Mr. Editor, call his attention to the following quotation from one of his former epistles:—"I have before me *a very excellent* treatise on photography, which exhibits a *singular talent for digression* * * * *. He (the author in question) introduces the bath, and then some thirty pages are occupied about silver, nitric acid, &c. Presently he introduces the camera, and then some thirty pages are occupied with a treatise upon light. He *speaks of colours, and lo! a lengthy disquisition ensues upon a new theory of colour.* Proceeding in this *digressive* style, it is with the utmost difficulty that the reader can contrive to dovetail the various pieces of instruction." Without comment, I am, dear Mr. Editor, yours, &c. EUSEBIUS.

[Your master says, "he thought you wished to become a *Photographic Artist;* but, since it appears that you only want, as our American cousins phrase it, to *make* pictures, your obstinacy be on your head"—so he "returns to business."—ED.]

ANSWERS TO CORRESPONDENTS.

J. C. M.—We have noticed the abuse you mention.

JOHN CHINAMAN.—We believe the article you mention is "made to sell."

B. SONGE.—Consult the "Photographic Glossary," under the appropriate head.

R. GUNTER.—The specimen sent is well adapted for colouring, both in tone and intensity.

A. BRISBANE, Greenwich.—We have not seen any photographs of the late aurora borealis.

W. H. D.—The best is always the cheapest, if a *fair* price be charged. Most dealers supply priced catalogues.

J. BACHE.—Asphaltum is only another name for bitumen, but there is a factitious asphaltum obtained from coal.

W. CARTER, Lincoln.—Nitrate of uranium is not nearly so dear as nitrate of silver. You have been grossly overcharged.

ARCHIBALD BURNS, Edinburgh.—Several correspondents are desirous of knowing where copies of your stereographs can be purchased.

FOCUS.—It is very probable that the ground glass is mounted in the frame on the wrong side; the roughened surface should be nearest the lens.

FRED.—You cannot expect to understand those matters without a knowledge of the rudiments of chemistry. Six months' diligent study will make you *au fait.*

SAM SLICK.—We cannot say what gum juno is; perhaps it is gum juniper, the berries of which contain ten per cent. of a resin possessing an odour of turpentine.

S. H.—A bad workman always throws the blame on his tools; with bad photographers it is always the "nitrate" or the "hypo," or anything but want of tact and judgment.

H. DOUGLAS, Edinburgh.—The only chance of stopping the evil is to immerse the paper for a few minutes in a quart of rain water, acidulated with a few drops of hydrochloric acid.

ARGENTUM.—Your bath is doubtless in an alkaline state. Immerse a fresh piece of reddened litmus paper, and see if it becomes blue: if it does, add a homœopathic dose of nitric acid.

C. SMITH.—We have before noticed the garbled extract from our report on Derogy's lenses. We did *not* say that they are "equal to six ordinary lenses." Please to refer to the original report.

COSMOS.—You cannot expect to do much good until March next; meanwhile study the back numbers of this Journal, and make notes for reference on those points of which you are ignorant.

VERNIS.—The highest strength of alcohol allowed by the Excise has a specific gravity of 0.825. You can make your spirits stronger by adding dry carbonate of potash or pearl ash, which is insoluble in alcohol.

JOB.—Your patience is exemplary. Write again to the fellow: if that elicit no notice you can recover the amount of the bill in the County Court, after you have returned him his rubbish with due notice of your intentions.

T. RILEY, Jun.—We have so many inquiries about stereoscopic cameras that we shall probably prepare an article on the subject shortly; in the meantime you must be content by our again saying a bi-lens camera by all means.

C. L. * * * *—The stereographs sent for review have arrived, but are such that we cannot commend; the subjects being without exception puerile or vulgar (one or two have both objections). The only favourable point about them is, that they are certainly very well printed. Under these circumstances we must decline any special notice, and would prefer returning them to you if you will oblige us with your correct *address.*

H. BARTON, Croydon.—The method suggested by M. Gaume consists in making a solution of gutta percha in benzoin; when clear, decant it. Paper immersed in this solution becomes waterproof, and if used for printing positives upon, the hypo does not penetrate the paper, but acts only on its surface, and, consequently, is easily removed with mere washing. The paper becomes slightly translucent, and has quite a glassy appearance. If it presents a granulated appearance, holding it before the fire will render it even.

RECEIVED.—T. Mills, R. S., J. T. T. &c. W. Q. in our next.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this* Journal, *should be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE PHOTOGRAPHIC JOURNAL.

No. 107, Vol. VI.—DECEMBER 1, 1859.

We published in our last Mr. Ennel's rejoinder, in accepting our challenge (thrown out in No. 99, page 184, of the current volume) to discuss the principles of the swing-back camera, upon the utility of which contrivance we hold diametrically opposite opinions. Our opponent inquires—"is not *error* synonymous with *wrong in principle*." We reply certainly not. The *principle* upon which achromatic lenses are constructed is perfectly sound, viz., that of employing a medium of high dispersive and low refractive properties to correct the errors of another medium of low dispersive but highly refracting qualities; yet no lens is absolutely achromatic, however nearly it may approach to that condition—not from *error of principle*, but from unavoidable imperfection of materials and workmanship; hence we assert that even the best lens is only one in which the *errors* are reduced to a minimum.

It will be apparent, from Mr. Ennel's definition of the words *point* and *distortion* as applied in his communication to the *Journal of the Photographic Society*, that our demand for it was absolutely necessary, in order to avoid involving ourselves in "a question of words and names;" and why that gentleman should with such ultra latitude consider the former to signify "visible forms with certain proportions," while at the same time he narrows the signification of the latter word so strictly as to mean "representation in which the relative proportions *differ* from those of the original," without any limitation, would seem somewhat inconsistent, unless we are to suppose that he does it with a view to supplying us with a stumbling-block or two to embarrass the freedom of our movements. We have to thank him for supplying a reason why we assert that in the case of a small distant window (only) to be delineated the swing-back camera would be *misapplied;* but unfortunately he has not assumed the correct one. It would be misapplied, because useless: the small distant window at right angles to the line of vision would not be *perceptibly* distorted even if the back of the camera were inclined; but it must be borne in mind that we are not obliged to incline it upon *all* occasions, whether rightly or wrongly.

We object to the major premiss, that "*all circles* projected on an inclined plane are ellipses;" for, if the circle be itself inclined to the axis of vision (the precise case in which we advocate the use of a swing-back), its projection would not be the transverse section of a *cylinder*.

Our antagonist's definition of *distortion* is too narrow when applied to the matter under discussion, for the reason that, if taken in the strict sense to which he has confined it, viz., any (even the smallest) departure from relative proportions, then every camera picture delineated upon a plane surface must of necessity be more or less distorted over its whole surface, except that part *immediately in the axis of the lens;* for it is obvious that as we approach towards the margin of the picture the plane of delineation becomes more and more oblique to the axes of the pencils of rays depicting those parts, and consequently, according to Mr. Ennel's views, more and more distorted. We admit, nay we have asserted, that in a *strict* sense this is the case, because the subjects at the margin of every camera picture, a plane of delineation being employed, must of necessity be taken upon a *slightly larger scale* than those in the centre of the plate; and therefore, in using a plate inclined to the axis of the lens (as is sometimes done in a swing-back camera), we *decrease* the error on one side of the axis as much as we increase it on the opposite side. We were therefore justified in the assertion, that if, when employing a plane surface of delineation, we incline it to the axis of the lens in certain cases, the error, if regarded even in its most limited sense, is only one of degree.

The truth is, that in applying the word *distortion* to a photograph, *perceptible distortion* is what is intended to be understood; and if any of our readers will take the trouble to focus a camera upon a small distant window, and swing the back to the utmost extent usually provided for, they will find that no *perceptible* distortion will occur. Having then cut away the foundation of our friend's ingenious argument to prove that we have assented to his proposition, we need scarcely attack the superstructure, seeing that it falls of itself.

Mr. Ennel speaks of a circle being projected on to a plane as represented by the transverse section of a *cylinder;* but when a lens is employed this is not at all the case, the lines all crossing in the axis, so that even if there were no deviation of the rays the figure described would be that of two cones with their apices connected.

However, in point of fact, each mathematical *point* of a subject is delineated by means of a pencil of rays radiating therefrom being collected together in the conjugate focus of the lens, and the figure described by each bundle of rays is that of two cones with their bases united, the bases being sometimes at right angles, but oftener oblique to the axis. It will be therefore readily understood that instead of any such simple figure as that of a cylinder playing any part in the matter, a figure of a very complicated character is that really described by the rays of light in their passage through the lens. If, then, as we have shown, that distortion in its strict sense must occur in every case where a flat plate is used, whether it be inclined to the axis of the lens or not, and that by inclining it in certain cases we merely dispose of the error somewhat differently, *without increasing its total extent*, it is surely better in submitting to the scarcely perceptible variation of scale, which we must do in using a plane surface, to have all parts in tolerably distinct focus, than to have them all out of focus and indistinct; hence we reiterate our assertion that, theoretically and practically, the swing-back is a highly useful adjunct to the camera in certain cases, viz., where the objects to be delineated lie in a plane oblique to its axis.

We have carefully endeavoured to avoid any expression that might by possibility give offence to our opponent; but as we find that even the most harmless ones are occasionally misconstrued or misapprehended, we cannot conclude without stating that we have had no intention of writing anything that should be regarded as offensive.

At the last meeting of the Photographic Society an attempt was made to get up a discussion relative to the merits of the various kinds of landscape lenses—with but little success. Is it not possible that the failure may have arisen in consequence of fear of what the speakers might find attributed to them when

repeated in the Society's Journal? We speak feelingly upon the point, for we have been quite horrified to find what a tissue of *nonsense* has been set down to our account in the *Journal of the Photographic Society*, in consequence of the few words we uttered upon the occasion in question. We beg any of our readers who may have read the report of the meeting in the organ of the Society to peruse the statement of what we really did say, which they will find in our last. It will be an act of charity to us, for we quite wince under the imputation of such absurdity. We shall certainly protest against it at the next meeting.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

In the various branches of natural-history science, systems of classification have been repeatedly proposed, adopted, modified, and discarded in favour of others which have been found necessary to be framed in order to meet the ever-increasing requirements arising from more extended knowledge of species; but in spite of the most carefully guarded definitions, it is found that in nature there do not exist the arbitrary lines of demarcation which the systematist is obliged to adopt for his own convenience—the gradations from one marked form to another, at first sight totally different, being so imperceptible that every now and then, as intermediate ones become presented to our notice, we feel perplexed to decide under which particular head to classify them. We find ourself in this predicament at the present moment, having received from Mr. George W. Wilson, of Aberdeen, some exquisite stereographs, several of which are so truly "PHOTOGRAPHIC CONTRIBUTIONS TO ART," that we find it necessary to remove them from our usual "NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS," upon the principle that though every peer is of necessity a man, every man is not a peer. In making this distinction with regard to one series of half-a-dozen of those before us, and two or three others, we do not thereby intend to depreciate in any way the remainder, nor to assert that they are in the smallest degree deficient in artistic excellence; but we have here for the first time recorded by photography some of those marvellous effects produced by the *setting sun* that act so powerfully upon the feelings of the spectator, producing that sensation of calm enjoyment and repose which long dwells upon the mind as "a green spot in memory's waste."

It may be thought by some of our matter-of-fact friends that we are somewhat unusually enthusiastic in our admiration of that same *setting sun*. Be that as it may, we do thoroughly and heartily enjoy the effects of the ever-changing hues of the masses of clouds tinted and glorified by "the greater light that rules the day," but more especially during the last half-hour of its presence above the horizon. Our favourite sitting-room has an aspect looking due west, and we never voluntarily omit an opportunity of drawing our chair to the window in order to gaze our fill at the gorgeous scenes to be witnessed as the sun sinks slowly behind the hill in front of us. No wonder, then, that we feel somewhat more than usually impressed with the charming specimens before us; for though it is true that the colours are absent, yet we have a faithful transcript in black and white, not of the letter but of the spirit.

Most of our readers will doubtless have seen, and if so, will certainly remember, the beautiful illustration of clouds and sea with a brig in the distance, the work of M. Le Gray, which was published between two and three years ago. The productions which we are now criticising belong somewhat to the same class, yet there is a difference, and in our judgment a very marked advance. While M. Le Gray's picture was admitted by all to be most beautiful, it gave the idea of *moonlight* albeit taken at high noonday; but here we have sunshine—glorious, liquid, golden sunshine!—that gladdens the heart while it soothes the spirit. Again, M. Le Gray's masterpiece consists of clouds and sea alone, exquisite in their way, but destitute of shadow, or nearly so.

It has generally been regarded as perfectly futile to attempt to take a photograph of any subject whatever with the sun looking directly into the camera. As a rule the proposition holds good, because all objects so seen—*except those in a horizontal position*, as for instance water—must appear in deep shadow, and consequently without detail; but, like other rules, this one is not without an exception, as Mr. Wilson has proved in his six sunset views of the Loch of Park, in Aberdeenshire, the *locale* of which is the same in each.

On the further side of the lake, the waters of which are here and there stirred by a gentle ripple, is seen a range of hills. Here and there low banks clothed with bullrushes peep above the waters, while in each one of the series fantastic clouds, more or less adorned with golden linings, which form a sort of trimming to the most favoured ones, surround or partially obscure the god of day, whose beams, descending in a golden shower, kiss the light ripple of the waters, and mark out a track of gorgeous brilliancy. In each one, also, is seen a boat, but varied in position and differently tenanted. That which we call the first of the series must have been taken late in the afternoon, and in each succeeding one the sun is seen lower and lower, till in the last he has just disappeared.

We cannot venture to say with what fraction of a second of exposure the negatives were taken: suffice it that they are sharp and brilliant. It is not a little difficult to decide upon which to admire most where all are so charming; but, for brilliancy of effect upon the dancing ripple, that one where the sun appears nearly free of clouds is perhaps the most sparkling; while for calm repose we should select that in which the boat is tenanted by two young females, and a child seated on the point of land to the right of the picture.

There is also a remarkable effect produced in one where the strip of light forms a background to the boatman who is rowing.

There are three other specimens which we consider should be included under our present heading as presenting something new and valuable to art, viz., The Gathering Mist, Muchals, No. 74; The Lower Falls, Moness, Aberfeldy; and The Second Falls, of the same locality.

It is only those who have loitered in the hill country who will be familiar with the peculiar way in which the mist gathers about and clings to the sloping sides of the lofty hills, while all else around is bright and clear. 'Tis then that the hills appear "clothed as with a garment," and Mr. Wilson has caught the effect most perfectly, the mist being purely local and semi-transparent, like the gossamer muslin half veiling the limbs of a young girl.

The other two subjects which we have above indicated are in character allied to that we have just noticed, in the beautiful rendering of that impalpable atmosphere of moisture which will be instantly recognised by those who have been fortunate enough to visit the scenes made charming by the ever-flowing streams bounding from rock to rock, while those who have not will now be able to realise perfectly the idea of what such scenes are like. The water, too, in these specimens does not appear as a mere patch of white, but just as in nature—foaming, *woolly*, semi-transparent, with the spray literally pounded up to a fine powder. Add to all this the picturesque detail of rocks, shrubs, ferns, &c., grouped in charming disorder, and one may well conceive what a rich treat is in store for those who are wise enough to avail themselves of the opportunity of procuring such unsatiating pleasure. To artists these productions will prove invaluable, enabling them to examine and study at their leisure scenes that they can only rarely visit, and such scenes that only faithfully to imitate in these their poetical aspects is to create an undying reputation.

Here we must pause for the present. We have more yet to bring under the notice of our readers connected with Mr. Wilson's productions, but we must defer further mention of them till our next; for, as we endeavour to play the part of a

true and faithful witness, it is not without careful examination and study that we can be in a condition to do justice either to our readers or to the artist, and all this occupies time and demands calm consideration.

EXPERIMENTS WITH ARSENITE OF SODA.

By R. L. Maddox, M.D.

At this season of the year we may expect out-door photography to descend to its minimum, therefore anything suggestive to increase the value of the low actinic power will doubtless find its proper estimation among those who purpose taking their stand against wind and weather.

In the letter from Mr. Church (Journal of August 15th) the statement that arsenite of soda had been used in the collodion used in the instantaneous pictures produced by Mr. Kibble, led me to hope that I might find it of value in the paraffine process. On trial it did not give me any advantage —I thought rather the reverse; but this might have depended on the mode of using or quantity employed.

As an albumenised solution was prepared with arsenite of soda I determined on trying it in the preparation of dry plates, Fothergill's plan. The collodion used to first coat the plates was a mixture of several kinds, which collectively contained iodide and bromide of potassium, iodide and bromide of ammonium, iodide and bromide of silver: it was of a sherry colour.

The plates were sensitised as usual; after washing, to get rid of the free nitrate, some of the following solution was poured over them: —

Arsenite of soda .... 16 grains.
Rain water.. 3 ounces.
The white of one egg. These were mixed a fortnight previously.

To one ounce of the above an ounce of rain water was added, and filtered through sponge for use: the plates were drained, washed, reared up to dry; the drying being completed by artificial heat.

To some of the weak albumen and arsenite of soda liquid an equal part of saturated solution (in the cold) of gallic acid with one drachm of Beaufoy's acetic acid to each ounce was added, and then poured over the sensitised plates, which were washed, &c., and dried.

A plate prepared by each method was exposed at the same time in a bi-lens camera (the day clear, but very windy, sun shining moderately) for 20 seconds. The time that I should have allowed for a dry plate according to my usual plan of preparing would have been at least 60 seconds.

The development was proceeded with gradually, using equal parts of the above indicated gallic acid solution and a one-grain pyrogallic solution, with a couple of drops of a 20-grain solution nitrate of silver.

The pictures showed very slowly. After the parts were pretty distinct the strength of the developer was increased: here its colour altered sensibly, but did not become at all muddy. Gradually the plate with the arsenite albumen liquor showed signs of fogging, or indistinctness, very general over all parts of the plate *equally*, whilst the one with the addition of the gallic acid solution remained clear and bright. As the developer became coloured it was changed to fresh, and finally only pyrogallic was poured over it. The plates when cleared showed a marked difference, the vegetation being much more out in one than in the other.

The use of gallic acid was, I believe, suggested by Major Russell. So that you see I have offered nothing new beyond the combined use of arsenite of soda and gallic acid. As to the keeping qualities of the plates I can say nothing, but the accompanying prints from the negative with the gallic acid will speak for themselves. I am quite confident from sundry experiments that the plan now stated gave me a great *increase in sensibility*.

I have also used the arsenite of soda for positive printing paper, with varied solutions of nitrate of silver, both as regards strength and composition, also with gelatine and albumen. Some I found sufficiently sensitive to be impressed in a short time in the camera and developed by gallic acid. The hyposulphite appears to destroy the colour of the darkened parts much less than in the chloride papers. On some I poured boiling water, which produced only a slight change in colour when dry.

However I do not consider the experiments sufficiently decisive for more than a cursory allusion. Different papers are to hand for trials; but the weather and other engagements have put a stop to their continuance.

I send this in the hope some of your readers may gather something useful from the preceding remarks.

Woolston, 24th Nov., 1859.

N.B.—I do not know how the Poison Bill may affect the sale of arsenite of soda, if useful.

THE DIFFICULTIES OF THE DRY PROCESS.

By W. Ackland.

[Read at the Meeting of the South London Photographic Society, November 17, 1859.]

I purpose this evening to attempt a description of some of the difficulties of the dry processes, and trust the discussion which follows may elicit some explanation of certain defects which sometimes occur, and yet scarcely admit of a lucid explanation.

Before commencing, I would remark that it is my intention to confine my observations principally to the collodio-albumen and Fothergill process, as these are more frequently employed by the amateur and professional photographer than any others.

The difficulties encountered in the dry processes are:—

Blistering,	Fogging,
Opaque lines in the excited collodion film,	Want of intensity,
Brain-like markings,	Insensitiveness,
Reticulations,	Stripping off of the film,
Water markings,	Pin holes in the high lights.

Blistering.—This defect seldom occurs in working Fothergill's process, but is often observed in the collodio-albumen, gelatine, and oxymel process, &c.; indeed amateurs often assert that if blistering could be obviated the collodio-albumen would be the most certain of any known process. Many have attempted to explain the cause of this defect—one writer ascribing it to dirty plates, another to employing a collodion containing too much ether, and a third too much alcohol, whilst a fourth ascribes all the annoyance to using the iodised albumen too thick. Now I propose to attempt no explanation, but to suggest certain precautions. These are:—

Never coat a plate in a damp room.

Slightly warm the glass plate before pouring on the collodion.

Let the collodion set until the drop at the lowest corner drained from will receive the impression of the finger before lowering the plate into the bath.

Prepare the iodised albumen from eggs about a week old in preference to those "new laid."

And to dry the plate most thoroughly after the albumen solution is applied, and take especial care to prevent it becoming again damp before the final exciting.

The collodion many be deemed the great cause of blistering, and to this we must turn our attention. This must possess fluidity, yield a creamy film, and be adherent to the glass plate. To ensure fluidity it should be iodised a month before used, and if, when that time has elapsed, it still possesses glutinous properties and yields blistering plates, we must produce the proper state of fluidity by the use of an alkali added to it. The best plan to effect this is to add to each pint of the iodised collodion about half-an-ounce of recently and highly dried carbonate of soda, and to shake frequently during two hours, then let it rest for another two hours, and pour off the upper clear portion into a perfectly dry bottle for use. To ensure a good creamy film the collodion must be iodised with a mixture of iodide of cadmium and iodide of potassium, and should contain at least six grains of the mixed salts to each ounce.

The adherence to the plate is somewhat dependent on the temperature at which the pyroxyline is prepared, for although very high temperatures have been recommended, it is found desirable in practice not to exceed 150° Fah. in preparing this substance for the dry process. The collodion mentioned above being highly iodised requires an exciting bath containing not less than thirty-five or forty grains of nitrate of silver to each ounce, and should be very slightly acidified with acetic acid.

Opaque lines in the excited film is the next defect. These lines occur in the direction of the dip of the plate, and may be traced to one or more of three causes: —

1st. To the plate being immersed in the bath before the film has been allowed to set sufficiently.

2nd. To the exciting bath being weak: and,

3rd. To the accumulation of alcohol and ether in the bath.

This latter cause is one of very frequent occurence, and is certain to give rise to such lines, more especially if the bath solution is not of full strength.

The remedy is to neutralise any free acid that may be present by carbonate of soda, and then to boil in a porcelain capsule for half-

an-hour, so as to expel the volatile portion, and, when cold, to filter, slightly acidify, and dilute if necessary.

To ascertain if dilution is necessary, a bath-tester should be employed. This is simply a glass tube about ten inches long and half-an-inch in diameter, with a scale of divisions, commencing with 0 near the bottom, and extending to 100 near the top. To use it we must proceed as follows — [The bath-tester was produced and handed round] : —

Take of highly dried and perfectly pure chloride of sodium 84½ grains, and dissolve it in twenty ounces of distilled water; this forms the test solution, and requires to be made *with exactness*, or the result obtained by its use will be erroneous. A second solution is also needed; this is made by dissolving twenty grains of bichromate of potash in one ounce of water.

To test the strength of a bath solution, take the bath-tester and drop into it one drop only of bichromate of potash solution, then fill the tube up to the lowest division, marked 0, with the bath solution, and add the standard test solution, gradually shaking at frequent intervals: when the colour of the precipitate, which was at first brick red, changes to a lighter tint, add the test solution more gradually, and continue to shake up between each addition. Continue to add the test solution, drop by drop, until the red tint of the precipitate suddenly changes to white, showing that all the nitrate of silver is decomposed, and that enough test solution has been added. Now read off the division on the level with the surface of the fluid in the bath-tester, and it will be equal to the number of grains of nitrate silver contained in each ounce of the bath solution. Thus, supposing, after having performed the experiment, the fluid in the bath-tester stood level with the 39th division (counting from below upwards, the same as the tube is figured), this would indicate that each ounce of the bath solution tested contained thirty-nine grains of nitrate of silver.

This plan of using bichromate of potash, to show by change of colour when all the nitrate of silver is converted into chloride, was published some years since, and, although but little used, answers perfectly in all cases except to test the nitrate of silver bath, after having been used to excite collodio-albumen plates. In this case, the precipitate which forms on adding the test solution remains coloured, however much is added; therefore, the use of the bichromate of potash solution must here be dispensed with and the test solution added, gradually shaking after each addition, and allowing the white chloride of silver which is found to settle down, until the test solution ceases to produce any more cloudiness in the clear portion of the contents. The division level with the surface of the fluid in the bath tester here also indicates the number of grains of chloride of silver per ounce.

Reticulations, or crape-like markings in the film, arise from a defective sample of collodion being employed; or it may be caused by using a small quantity of collodion to coat a number of plates, as, in hot weather, the evaporation of the ether leaves the collodion in a condition to give these markings, but may be prevented, in this case, by adding a few drops of ether, from time to time, to supply the loss by evaporation. A collodion prone to these reticulations may often be made to give an uniform film by adding to each ounce eight or ten drops of chloroform.

Marblings, or brain-like markings, in the high lights of a negative often occur, and may be traced to a defect in the collodion, careless development, or partial washing after exciting.

Collodion yielding a compact film is very liable to possess this defect, and should be at once discarded for one of a more porous nature; indeed, I may here remark that a compact film is totally unfit for use in any dry process, and is the cause of many of our failures. Carelessness in imperfectly mixing the pyrogallic and nitrate developing solutions is often a source of these markings, as is also unequal washing after removal of the excited film from the nitrate bath, and the remedy is here, of course, apparent.

Water Markings.—These have been described by a writer in one of the photographic journals as occurring chiefly in the skies, but occasionally in other parts of the picture, and are of all shapes and forms: sometimes (on a minute scale) very like what are called in silks, and other fabrics, "water markings," and, at others, patches of varying length and breadth, either ending abruptly or shading off gradually into the upper edge of the film.

These markings were a constant source of annoyance to me in my earlier attempts at Fothergill's process; but, at last, I succeeded in discovering the cause, viz., using a collodion yielding too compact a film. By constantly using Powell's collodion, of late I have not seen a single marking; and in order to prepare a specimen of this defect to submit to your notice, it became absolutely necessary for me to prepare a collodion on purpose, and, as you see, my success has been very great, — for the plate now handed round is one of the worst cases of this kind of marking that can possibly occur.

The remedy is here, as in the last case, to use a porous film; for however carefully you may wash your plate, whether in four drachms, one ounce, or four ounces, on applying the albumen to a plate coated with a compact film, these defects will at once form, and, on the plate becoming dry, be very apparent.

Fogging occurs in the "dry process" in a somewhat similar manner to the same appearance in the "wet," and may arise from the state of the bath, over-exposure, diffused light, excessive "heat," vapours or gases in the operating-room, &c.

It is sometimes found that a bath solution after being used to excite a number of plates will yield foggy pictures, although, on testing the fluid, it is slightly acid as at first, and of the proper strength.

How to proceed here is a difficulty not easily overcome. The only plan likely to be successful is to add carbonate of soda until an alkaline reaction is produced, then to filter, and render the filtered liquid slightly acid by acetic acid. Should this fail, making a new bath will save both your patience and your pocket.

Over-exposure is sometimes the cause of fogging, especially when the temperature is high: here our course of action is apparent. Excessive temperature in the operating-room will often give rise to fogging, and is one of the many difficulties met with in a hot climate. Still, with care, we may prevent it by diluting the collodion with one part alcohol and two parts ether — by an increase in the amount of washing the film after exciting — by diluting the albumen mixture with one-third, and the developing solution with an equal bulk of water.

Diffused light in the operating-room is certain to cause "fogging." To test if the operating-room is sufficiently free from actinic light, expose an unwashed and excited plate in the room, near the source of light, for eight or ten minutes, then pour on the developing solution for half a minute, wash and fix with hypo'. Should the room admit no actinic light, and the bath be in good condition, the plate will be quite transparent; but if a foggy deposit has taken place the room or the bath is at fault, and if the former, an increased thickness of yellow calico or another pane of yellow glass must be used.

The vapour of ammonia or sulphuretted hydrogen, in the operating-room, is often the cause of "fogging," and must at all times be most carefully guarded against.

Want of Intensity. — This may arise from many causes. The most frequent in Fothergill's process are — defective bath, too much washing after the exciting bath, and over-exposure.

A defective bath often gives rise to a want of intensity, due to an unknown change which sometimes takes place in the bath solution; and, as no remedy is at present known, the employment of a new bath is the only chance of success.

Too much washing, after exciting, often gives rise to a want of intensity in the resulting negative, more especially if the collodion employed yields a compact film; and for this reason it also appears advisable to use a porous film, heavily charged with iodide. An excited plate — stereoscopic size — coated with Powell's collodion, is, I find, sufficiently washed with six drachms of water, whereas a compact film requires a much larger quantity, and there is more danger of the washing being carried too far.

Insensitiveness. — This fatal difficulty arises from the employment of a very acid or unsuitable collodion. The bath should contain (as before stated) forty grains of nitrate of silver to each ounce, be carefully saturated with iodide of silver, and give a very slight acid reaction to test-paper. To avoid "insensitiveness," or want of uniform sensibility, I adopt the following plan, supposing two dozen plates of first-rate quality were required: — We should here require, at least, four ounces of iodised collodion, and twenty-four ounces of bath solution, and test these by taking a view near the operating-room, by the "wet process;" and, if everything work satisfactorily, fill the bath (holding, say, twelve ounces) with bath solution, and pour off two ounces of the iodised collodion into a clean four-ounce bottle, and use this to coat and excite the plates; then add to the remainder of the two ounces of collodion about twenty drops of ether (more or less, according to temperature), and coat and excite six more plates. Having coated and excited these twelve plates with the two ounces of collodion and twelve ounces of bath solution, it is advisable to turn out the collodion and bath solution into stock-bottles, for further use after being tested, and to coat the second dozen of plates with another two ounces of collodion, and excite them in a fresh quantity of bath solution, of course taking care to add a small quantity of ether to the collodion after coating six plates as before.

This plan ensures uniformity, and is not more expensive in the end than if we attempt to economise by using a limited supply of collodion and bath solution, as the collodion and bath solution may be again used — the former after being slightly diluted with ether, and the latter strengthened if needed.

Stripping off of the Film.—It sometimes happens, on fixing a negative by many of the dry processes, that the film becomes detached from the glass, and slips off in washing. To avoid this, take a small-size camel's hair pencil, and tie it to a thin slip of wood so that the latter may project about one-fourth of an inch below the brush. Dip the brush so prepared into your bottle of negative varnish, and then, holding it upright and using the projecting slip of wood as a guide, carry the brush round the four edges of the plate, so as to leave a film of varnish about one-eighth of an inch all round.

This brush requires to be kept in a separate bottle containing a little alcohol, in order to prevent the varnish on it becoming hard and dry, and thus rendering it unfit for use.

The film of Fothergill's plates sometimes peels up at the edge, on the final drying, before varnishing; and, as this defect often accompanies a good collodion, we must prevent it by an extra roughening of the edges of the glass with a corundum file [the instrument was here exhibited], and when the plate is dry, after exciting, varnish around the edges as before described.

Pin-holes in the Skies.—These minute holes sometimes exist to such an extent as to spoil an otherwise good negative, and may be prevented by fully saturating the bath solution with iodide of silver, and avoiding a collodion iodised with impure iodide of potassium, and using very carefully-filtered developing solutions.

ON REMEDYING THE EFFECTS FROM "COCKING" THE CAMERA.

By W. Russell Sedgfield.

I was glad to see your remarks relative to a patent taken out by somebody for a new stereoscope for presenting the print to the eye in an inclined position, in order to correct the convergence of the perpendicular lines which is sometimes seen in architectural subjects. I did not know that there was anything novel in this. I have often looked at slides in the manner described, and have shown the method to friends. In the open forms of stereoscope, like Mr. Bennett's, this is readily done by simply inclining the picture; but I see that the patent "includes the application of the above principles to the stereoscope, in whatever manner the print may be presented to the eye in an inclined position." Can you tell me if I shall render myself liable to an action if I don't put the slide flat on its back?

There is, however, another method of viewing such pictures, with which the gentleman was unacquainted, or he would surely have patented it too, and which in some cases gives a much better effect. I enclose a stereoscopic slide of the spire of Salisbury Cathedral in evidence (such of your readers as are curious to see it can obtain it at Mr. Bennett's), in which the camera was cocked at an angle of more than forty-five degrees. This does not look natural by simply inclining the picture, but if, in viewing it in the stereoscope, you raise the instrument, *so as to look sky-wards*, just as if you were standing nearly under the tower and looking up at the spire, the effect is remarkably good. An open stereoscope is best, as in the common closed form the light is not sufficiently strong.

But a more immediate object in troubling you with this communication is to explain a method (before somebody patents it) of taking pictures of buildings with perpendicular lines which cannot be photographed without cocking the camera. It consists simply in copying the negative so taken, and in doing so, placing either it, or the plate on which the copy is being taken, or both, in such an inclined position as to bring the converging lines to the perpendicular. The first result is of course a transmitted positive on glass (or it might be taken at once on paper with a Woodward solar camera or other similar arrangement). A printing negative is then taken from the positive. Probably, when the cocking is considerable, the inclination of the plate in the first copying should be only half of what is required, and the correction be finished in the second operation; and if the original negative is taken with an ordinary landscape lens, and the copies with an orthoscopic one, the contrary qualities of these lenses would produce a picture almost absolutely free from distortion or curvature of the marginal lines. Of course the original can be enlarged or reduced at the same time if required.

[A very excellent idea, perfectly practicable, and sound in principle. Negative and plate should both be inclined and the orthoscopic lens employed as a copying agent. The specimen sent is very interesting, and the effect produced by viewing it as described, that is by looking upwards as one does when viewing the building itself, is very striking indeed. — Ed.]

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

LENS TESTING COMMITTEE.

Some correspondence has taken place between the Rev. Mr. Raven and Mr. Taylor, respecting a statement made by the former gentleman, that he was not consulted as to a word of the report on lenses, which appeared in some of the Journals.

It appears that the report was drawn up several months since, against which Mr. Raven made some objections, which were entertained by the Committee at a subsequent meeting, at which Mr. Raven was not present. No alteration having been made in the report, it was considered unnecessary to again submit it to Mr. Raven.

[We find it necessary to state this much, in consequence of a letter on the subject having appeared in the pages of one of our contemporaries, though intended by the writer to have been withdrawn.—Ed.]

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

Some little time back, while passing along the various frequented parts of the metropolis, wherever there was an available place for the operations of the bill-sticker we were sure to be saluted by the words, "No home without a Stereoscope," accompanied by a florid illustration, from a huge wood block, of a family party busily engaged in inspecting stereoscopic slides by the aid of stereoscopes of wonderful patterns; and, judging from the attitude of a lady in the foreground, we should imagine that the suppositious subjects under examination were of the most interesting character, for no human being could possibly maintain such an uncomfortable position for any length of time unless the mind were thoroughly occupied.

Of course the words quoted are only the prominent feature of some advertisement, doubtless setting forth *where* the said instruments are to be obtained for a mere song, &c., but there may be more of prophecy contained in them than would at first sight be supposed. No home without a stereoscope—possibly! nay probably! not many years hence; but certainly it cannot be long before there is no *school* without a stereoscope. What a splendid means of instruction it presents, and the more one considers it, the more we are impressed with a notion of its value when thus applied. We commend it to the attention of the members of the Educational Institute and College of Preceptors.

How common a thing it is to hear the observation, "it is not easy to describe it intelligibly, but *if you could only see it* you would understand it in a moment." Aye! there's the rub: if you could only *see* it — perhaps it may be something too bulky to be seen otherwise than by going to it—as, for instance, intricate machinery; or too perishable to last for more than a short or limited time, such as some beautiful extotic of the vegetable kingdom in full bloom; or too costly, or too distant, or what not. Now only take a good stereograph of the rare, valuable, intricate, or bulky subject, and, lo! the difficulty of inspection vanishes in a moment, and the distant object is brought literally "under the nose" of the spectator. Seriously, we are so fully impressed with the value of the stereoscope as an educational engine that, were it our lot to be employed in teaching, we should unquestionably avail ourself of its aid at once. Amongst other things, for instance, observe what an immense advantage it would be as an adjunct to geographical study—that bugbear to children (and grown people, too, for that matter), that "valley of dry bones" — but add to it the stereoscope by way of illustration, and, as in Ezekiel's vision, the dry bones "would live and stand upon their feet, an exceeding great army." How vividly could be brought before the mind's eye the peculiarities of mountain ranges, lakes and rivers, hill and valley, and all the specialities which go to make up the physical aspects of a country! and still more readily the inhabitants, the national peculiarities and customs, the natural productions, &c., &c. Geography, as generally taught in schools, is nothing more than barren lists of names, that, unaccompanied by anything tangible, are very rarely retained in the mind, except by a very great effort. Add but the stereoscope with proper illustrations, and that which is now a toil would become a pleasure, and we would answer for it more information would be both attained and retained than is now the case generally, and that in a tithe of the time at present employed.

Our readers will doubtless exclaim—"what has all this to do with newly-published stereographs?" We must plead guilty to a very long

digression, nevertheless it has something to do with the subject, for we have been led into it by an examination of a very interesting and extensive series of *Stereoscopic Views in China*, published by Messrs. Negretti and Zambra, of Hatton Garden, and Cornhill, London. The series consist of about three dozen and a half in number, tastily got up, each one with an appropriate ornamental label, and having on the back a printed description of the subject delineated. Although quoted correctly enough as views in China, they are chiefly confined to the neighbourhood of Canton; but, as a consequence, we are enabled to form a very correct idea of the nature of a place hitherto so little known, and so full of interest to the European. It would not be possible for any one possessed of the smallest amount of intelligence to rise from an inspection of this admirable series without having derived therefrom a very considerable share both of pleasure and profit; and the publishers are fully deserving of the best thanks of the public for their enterprise in procuring such valuable means of information. We sincerely trust and are firmly convinced they will receive substantial encouragement to proceed in a course so praiseworthy by an extensive demand for copies of this truly excellent collection, of which we now proceed to notice some specimens in detail, and will commence with the figure subjects.

Chinese Lady and Attendants (No. 42).—Seated on a stool, with the stem of a tree of gigantic dimensions for a background, is a small-footed specimen of a Chinese belle, though to European eyes there is not much that is attractive about her, with the high cheek bones, eyes deep set and near together, hair all gathered back from the forehead and fastened on the crown into a sort of knot. Her dress consists of a loose robe reaching to the knee, with large open sleeves, and fitting close and high round the throat. The white sleeve of an under garment protrudes from the dress sleeve and reaches nearly to the wrist. A pair of drawers made very loose in the leg, and shoes with immensely thick soles, such as all who visited the Chinese Collection, at Hyde Park Corner, or at the Crystal Palace of 1851, must be familiar with, complete her costume. In her right hand she holds a fan, and in her left a book; while her attitude, though unrestrained, is one not usually assumed by the fair sex in the Western Hemisphere, the left foot being nursed on the right knee. A female attendant stands on her left hand, attired somewhat similarly to herself, though with less of finish about the dress; and on the other side is a bare-footed, rawboned male attendant. The trunk of the tree before mentioned is of itself a curiosity: it spreads out at the base, being furnished with what woodmen call "spurs;" but although the thre efigures are not very close together, some notion of its size may be conceived of when we state that it forms a background to the whole of them, and projects beyond the group some distance on one side.

Portrait of Tseang Keun (No. 39).—This, the Tartar General-in-Chief of the army of Braves, is seated on a chair of state, attired in the full-dress costume of a mandarin, which is too well known to need description. On a table by his side, on a sort of stand, is placed his mandarin cap with the red button. The expression of countenance is intelligent, but the attitude a little stiff. Various singular-looking plants in flower, and growing in China vases, are disposed somewhat symmetrically, and the whole is pleasing and extremely characteristic, the background consisting of a quaint trellis work.

Portraits of Pey Kwei and Mr. Commissioner Park (No. 38).—The Governor of Canton and the British Envoy are seated at a table, while six attendants of the former are standing at the back. Like the last mentioned, this group is also taken in a species of verandah or conservatory, flowers in vases being disposed around, and the trellis, resembling irregular hexagonal network, has thrown a shadow on the countenances of the Chinese figures which produces an exceedingly grotesque appearance. Our own countryman being seated with his back to the light has escaped this disfigurement. This, like the last slide, is one of very great interest.

Pa tah lom boo (No. 41).—A Tartar brigadier-general, mandarin of the blue button, is in the centre of the group, and around him are disposed some of his children and other members of his family, with the reverend chaplain of the British army in Canton.

Group of Sailors (No. 40).—This slide is interesting on account of the locality, the garden of the Allied Commissioners, Yamun. Although exceedingly different from an European garden in appearance, it is highly picturesque. On the left of the spectator is a tree of very singular aspect, the stem of which consists of an immense number of branching and anastomosing parts twisted and matted together in the most extraordinary manner. A large-roofed building, open on all sides, and protected by a grove of trees, is, no doubt, designed with a view to obtaining shelter from the sun without obstructing the free current of air.

The Landing Place (No. 6).—This is a small wooden jetty, supported on wooden piles driven into the bed of the river, upon which are seen several natives *squatting* in what appears to the English eye a very fatiguing and comical attitude. In the river are seen several structures that look like small houses, supported on wooden stakes, and in the foreground are a palaquin and the two bearers also *squatting*, but in this case with their knees and chin in contact, and the hands clasped round the knees: with the large mushroom-shaped hats, they present a very droll appearance. This will no doubt be a favourite slide, as well for its novelty as for its picturesque effect.

(To be continued.)

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. X.

Man proposes and God disposes. I write this from Haifa, or Caipha, which lies at the outlet of the River Kishon and the Plain of Esdraelon. It is the modern village which has taken the place of Saint Jean d'Acre, known in the times of the crusades as Ptolemais — a small and filthy place, which possesses no interest except as the probable point which will one day be connected with Jerusalem by rail, if there be ever a railway laid in Holy Land.

Acre, ruined and desolate, stands on the seashore in solemn and stately grandeur. There is an interest that no words can convey an idea of always clinging to such a spot. From early Christian days this spot was regarded as the key of Palestine; and, indeed, long before the days of Christ the Plain of Esdraelon, which here finds an outlet to the sea in the waters of the Kishon, was celebrated as the battle-field on which the nations who invaded Palestine conquered or were defeated. Here Sisera, in the ancient years, was driven to flight; and here Napoleon, but yesterday as compared with the other, with a small troop of men, conquered a host of dusky foes. There has not been a century, for three thousand years, in which there has not been some battle fought on the plain near Acre. The old city seems to know the splendour that hangs around her decay, and sits as proudly in the sunshine as if throned as of old and surrounded with stout guards in flashing armour. I took more than ordinary interest in this place, it being the scene of Sir Sydney Smith's prowess, whose physiognomy my own is said to strikingly resemble.

But I have not told you by what chance I came here; and unless I acquaint you with it you may marvel at my eccentric movements. It was in this wise. When I returned to Jerusalem, from that last evening on the Mount of Olives, I found in the little hotel a party of Englishmen who had recently come from Alexandria. They had been in the city a few days before, while I was away at Nablous, had gone down to the Dead Sea, and were now on their way back to Jaffa, intending to take the steamer thence for Constantinople. This is the common and easiest way of visiting Jerusalem. Come in the weekly steamer from Alexandria, land at Jaffa, ride up to the Holy City, visit Bethlehem, the Dead Sea, and Jordan, and return to Jaffa in time for the next week's steamer up the coast.

My route was laid out. Go over to Cæsarea and up the coast to Mount Carmel. Next morning we rode out of Jerusalem together before daybreak, paying our sleepy guard our last backsheesh for opening the Jaffa gate. Before we reached Jaffa, the temptation to continue in English company was irresistible, and I changed my plans entirely. You cannot imagine the exceeding pleasure of that long talk with old friends. The hours flew by like minutes. Could you appreciate it you would understand how ready I was to change.

A few directions to Hassan sufficed. I ordered him and all the men, with the baggage and tents, to proceed up to Beyrout by the coast road, passing the nights at fixed places which I named. John and I joined the party for the steamer, to go by sea to Beyrout, for the sake of two days more in their company. We found the French steamer at Jaffa in the evening of our arrival, and went instantly on board.

The French steamers on the Mediterranean are a very rough class of vessels. Still, in pleasant weather, with the hatches open, and the ladies in good health, the dinner table presents a gay scene, and there is some fun in listening to the good and bad French, the mixed Arabic and Italian, the English, Spanish, and German, which the various lips and throats utter.

The *Tarbucket* is a miserable fourth-class tub, with no deck-room, and the same amount of cabin. The chief officer is the steward, a withered little Frenchman, who commands the captain, and is sworn enemy to all passengers who are not sea-sick. The

bill of fare of all the French steamers is printed and published in a volume at Paris. All *Messagerie Imperiale* steamers, to all parts of the world, are said to have the same bill on the same days; and as there are some fifty or seventy-five steamers afloat in various services, it is consolatory to know that there is plenty of company in the misery of the most wretched food that could be contrived for the stomach of a sea-sick man. The nominal commander of the *Tarbucket* has had a few private dishes of his own on the table every day, which he sometimes divided with the mail agent — a gruff, grey, tall, thin man, whose lessons of politeness have been learned, and badly learned, in the Faubourg St. Antoine. The doctor of the ship is a little fellow, given to drumming on a piano in the ladies' saloon, and to eating enormously of the vile stuffs concocted between the steward, the cook, and the proprietors of the line. Such is the list of the ship's officers. The working master speaks some English, such as it is. He is a tall, good-looking fellow, and a gentleman withal. But for him, I verily believe, we should have been utterly used-up in the three days voyage from Jaffa northward.

The morning after our arrival at Jaffa the steamer was detained, and we went on shore, to be recalled by a gun when she should be ready to sail. We passed the day in looking at Jaffa, which I have before described to you. Externally it is both common and unclean, the haunt of Gentiles and Jews who are alike beyond the reach of even the Catholic preaching of Peter.

The gun was fired at three. A boat waited for us at the landing stairs. Pushing our way through the crowd of beggars that thronged the platform, we sprang in and shoved off; but by some accident John was left on the platform, and his shouts reached my ear just as we were dashing through the narrow channel in the reef, into which a westerly breeze was now rolling a heavy sea. Backing all, and swinging in on the top of the waves, we had well nigh been upset; but another boat astern of us was in worse condition, for, as we went in towards the stairs with the dash of the sea, she shot across our track most recklessly, and we cut her down to the water's edge, and swamped her then and there. Dire were the shouts of the Arabs, and furious the demands for payment of damages, on the principle that we were the charterers of the boat we were in, and liable for her acts and accidents. The damaged owner, with his assistants, laid profane hands on John, who was quietly awaiting our approach, which they had no sooner done than they repented most heartily; for herculean John seized two of them by the throat, shook them alternately till they were black in the face, knocked their thick skulls together, and kicked the third — the unlucky owner — into the sea. A howl of fury rose from the crowd of all nations on the platform, but no one ventured to lay hands on the giant. John leaped into our boat, and we rolled alongside the steamer. Rolled, I say, for the sea was short, and the vessel pitched at her anchor, so that the passenger gangway was alternately six feet under and six feet above water. No small exertion of skill was requisite to get on board in a dry skin. You must watch your chance as she came down, leap to the highest possible step before she rolled to port, and if you missed your footing, trust to the Arab boatmen and your powers of swimming. Safe on board at last, the usual row with the boatmen about the pay followed, and was ended by tossing a handful of Turkish coppers into the bottom of the boat, which only served to elicit louder demands for more, inaudible as we ducked down the companion-way to the dinner table.

A dismal row of empty seats there were that day at dinner time, for the sea was heavy, and the smell of the oil most vile. All night we tossed and pitched along, and all the next day and the next night, by the port of Cæsarea and the coast of Holy Land. Once we put back. At times our situation was critical and alarming. We lay-to twenty hours, and it was noon of the third day before we reached the lofty bluff of Mount Carmel, and, passing it, ran into the port of Haifa.

There is never anything so very bad that some good may not come out of it. Even *Francois*, the steward of the *Tarbucket*, did us good when he intended our hurt. He had a sharp eye to his provision-lockers, and always warned his passengers to stay on shore when he could thereby save a few mouthfuls of dinner.

"The steamer will not leave Haifa to-morrow!" This was his announcement as we were going down the ladder into a boat to go on shore.

"And why?"

"There is a Turkish Pasha, with his family, coming on board; and he has paid extra to have the steamer wait a day!"

"And we must wait his pleasure? Is that the way of doing business in a French steamer?"

"If Monsieur wishes to complain, there is a complaint-book in the cabin; but, perhaps, Monsieur will save himself the trouble, and have more time to go to Mount Carmel?"

The idea was good, and we improved it by visiting the convent on the mountain, where they preserve the memory of Elijah and Elisha.

It was a long and pleasant day. Climbing the sides of the hill, visiting the old monks in their mountain home, where they rest in calm looking out over the tossing sea, and then, when we saw a cloud, somewhat larger than a man's hand, on the western horizon, hastening helter-skelter down hill more furious than Ahab, and not so fortunate; for he escaped the tempest, but we got soaked and drenched long before reaching Haifa, and came on board ship in the evening fit subjects for the sympathies of the Royal Humane Society. D. T.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The November meeting of the above promising young Society was held on the evening of Thursday, the 17th ultimo; the Rev. F. F. Statham, B.A., F.G.S., President, in the chair.

The Chairman having laid before the meeting a programme of the evening's proceedings, called upon the Secretary to read the minutes; which were confirmed. Several donations were then acknowledged.

Mr. Leake, Jun., presented the Society with a capacious wooden folio, and stated that if the gentlemen present would *only* fill it, he would have another ready to present to the next meeting. He also placed within this folio its first photographs, as an additional gift.

Mr. Hannaford gave several specimens of various printing processes. Mr. Howard added half-a-dozen very beautiful stereographs as specimens of the Fothergill process; and Messrs. Cotton and Wall contributed a few other photographs.

Mr. Wall, the hon. sec., pointed out the various articles exhibited in the room, among which were *a camera-stand* for out-door work, by Mr. Howard; *some very fine stereographs* (Fothergill's process), taken by Mr. Archibald Burns, of Edinburgh, and exhibited, with a number of other curious and interesting slides, by the Secretary; a new, singularly portable, and very complete stereoscopic *camera and dark slides* for the dry processes, by Mr. Clark; a very light camera (by the same gentleman), portable and capable of being packed into a very small compass, intended for large views.

A very compact set of apparatus was brought forward by Mr. Hannaford, as used by himself for out-door work.

Mr. Smith, of 16, Mark Lane, exhibited a large collection of rare photographs, landscapes, architectural subjects, copies from paintings, prints, statuary, &c., — taken by Fenton, Caldesi, Bingham, Melhuish, A. Watts, Bisson Frères, and others—a selection chosen with extreme taste and excellent judgment.

A photographic coloured copy, by a native artist, from China; several stereoscopes, and other articles, were also exhibited.

Votes of thanks were awarded severally and individually to Messrs. Leake, jun., Howard, Hannaford, and Cotton and Wall, for their prompt and kind donations, and also to the various exhibitors.

Mr. W. Ackland, vice-president, then read a paper on *The Difficulties of the Dry Process*. [See page 295].

Mr. Ackland resumed his seat amidst expressions of applause.

The President rose to thank Mr. Ackland for so very useful a paper. He had been pleased to hear of difficulties rather than impossibilities, and to know that defects were not without remedies. The specimens of the various defects which the vice-president had provided to illustrate his remarks were, he thought, wisely produced, inasmuch as, being seen, they would be more readily recognised at any future time by amateurs in the dry processes, when the remedies and precautions Mr. Ackland suggested would doubtless prove of great service. To know an enemy was a good way of vanquishing him. Having run over the memoranda he had taken to give in one view the character, &c., of the various difficulties, the rev. gentleman said the references which had been made to some of the photographic publications proved their great value; and concluded by awarding to Mr. Ackland the usual vote of thanks.

Mr. F. Howard said Mr. Ackland's paper was, in his opinion, an invaluable one, pointing out as it did means of removing the many difficulties which beset the dry collodion worker. He would venture to make a few remarks: and, first, with regard to blistering, he would state that, judging by his own experience, it proceeded invariably, in Fothergill's process, from using the glass when it was

not perfectly dry (the collodio-albumen he did not follow); he would therefore advise operators not to be content with merely cleaning their plates well before using, as when they had been put by for any time they required friction (or warming) to remove what he might term an imperceptible moisture, which glass was apt to retain even when kept in a dry room. The breathing upon the glass which photographers adopted to ascertain its cleanliness ought always to be succeeded by a brisk rubbing or other means of warming the plates. As regards water markings, which were among the greatest obstacles to successful results in Fothergill's process, he had succeeded in entirely removing them. He had found in the course of numerous experiments in various collodions that these markings invariably occurred with greater distinctness on one half of his stereoscopic plates than the other, and that half was the one over which the albumen last travelled. It then occurred to him that the albumen when applied after washing the plate had sufficient density to push all moisture before it to a certain point, about two-thirds the length of the plate, when, becoming diluted and no longer able to assert its supremacy, from that point an uneven coating was formed, and the markings began. To avoid them he proceeded in this manner: — after the plate had been removed from the bath, washed, and drained for half-a-minute, he applied the albumen along the long edge of the plate, allowing it to travel slowly right across; it thus had only three-and-a-quarter inches to pass over instead of six-and-three-quarters, and found that by so doing the result gained had been a total absence of the annoyance.

Mr. Ackland, in reply to Mr. Howard, and in reference to the water markings, stated that he invariably found that the markings were not (in his experience) at the bottom but at the top of his glass, and that therefore, in his case at least, the remedy pointed out by that gentleman would not apply.

Mr. Howard also stated that he could produce good pictures with any good negative collodion, want of sensitiveness being the only drawback to the use of such as were not specially prepared for the dry process. With regard to the splitting of the film after fixing, it was caused, he thought, by drying too quickly in a current of air, or near a fire. Washing off he prevented by running round the edge after drying, and before exposure, a brush dipped in albumen; he would therefore persuade workers of the Fothergill process not to discard a good negative collodion simply because it was not prepared for the purpose. If a good wet negative could be got by the collodion and bath, a good dry one, with proper manipulation, would be likewise insured.

Mr. Smith made some remarks regarding the use of gutta percha baths.

Mr. Hannaford remarked that one reason for the blistering which occurred in the collodio-albumen process was that the albumen and collodion film expanded in different degrees on being covered with the developer, and great care should therefore be necessarily used in the selection of collodion. Coating the plate entirely with albumen before applying collodion would prevent non-adhesiveness, and also, to some extent, blistering. Water marking, &c., &c., in the Fothergill plates most frequently, in his opinion, arose from not using the albumen sufficiently diluted. He found the white of one egg in half-a-pint of water quite enough. Marbling from careless development would be, to a great extent, prevented if the plan suggested by Mr. Burnett should be found to answer. He should allude to it in a jotting he had prepared for that evening, which, as it related to the subject under discussion, he might perhaps then be permitted to read. Mr. Hannaford then read as follows: —

I am of opinion that the great secret of success in employing dry plates is in thoroughly washing them. The following plan I like best of all I have tried: —

The collodion should contain a bromide and perhaps a chloride in addition to an iodide, for reasons which will presently be seen. The plate after sensitising is dipped into a pan of water and moved about so as to remove *and save* the greater part of the free silver, and afterwards washed in an unlimited quantity of water under the tap. It is then coated with the following, and washed as before: —

Water	Half-a-pint.
White of one egg.	
Iodide of potassium	Quantity immaterial.
Bromide ditto	
Chloride ditto	

The plates in this state are quite insensitive to light, and will keep any length of time. The operation so far may be conducted in broad daylight — a great convenience for those who have not an unlimited supply of water in their operating-room. To sensitise the plates immerse them in a very weak silver solution, the first washing for instance, and allow them to drain and dry without further washing; or re-dip in the nitrate of silver bath, and thoroughly wash. So far this is only a modification of the collodio-albumen process, in which there is nothing new. The plates in this state will not keep any length of time. This is owing to the presence of free *nitrate* of silver. Plates to be sensitive must have a considerable quantity of free silver present; but it need not be the *nitrate* or any other soluble salt. Bromide, chloride, acetate, citrate, oxalate, &c., &c., answers equally well as regards sensitiveness, and far better as regards keeping qualities; and therefore it will be found that by immersing sensitised plates in citrate, acetate, or hydrochlorate of soda, &c., and afterwards washing them, enables us, without risk, to leave much more free silver on them than when it is in the form of a soluble salt.

Mr. Burnett states that plates prepared in this manner require no silver to be added to the developer — a matter of some importance in the case of long development.

The reason for adding bromide and chloride to the collodion will now be understood; for an iodised plate is sensitive when bromide, chloride, or other salt of silver, soluble or insoluble, is present; and it matters not whether this salt be formed in the collodion at the same time as the iodide, or precipitated afterwards. By adding the salts to the collodion we obtain an evenly sensitised plate with more certainty than by partial washing and precipitation on the film.

Mr. Howard made an inquiry with reference to the exposure.

Mr. Hannaford: The same as for Fothergill plates with like collodion; but as acetate or citrate of silver on the film gives increase of intensity, collodion of a different nature may be employed, and greater sensitiveness secured.

Mr. Martin thought the blisters spoken of had their origin in damp plates, recommended warming over a spirit lamp, and explained his reason for this opinion. The exposure also was, he thought, of great importance in avoiding the defects arising from developing too quickly, &c.

Mr. Leake: I think it a good plan, at least in the wet process, to warm the plate if the atmosphere be at all damp. As I have not practised the dry process to any extent, I do not feel competent to say whether damp glass may originate blisters or not; but it is very probable that Mr. Howard may owe his great success in the dry process in some measure to the warmth obtained from friction in polishing his plate immediately before use.

Mr. Herve pointed out the danger of the electricity obtained by friction attracting floating particles of dust.

The President then called upon Mr. Hannaford to read his promised paper.

Mr. Hannaford said:—

Mr. Chairman and gentlemen, as there are very many matters constantly recurring in every one's photographic experience which, without being of sufficient consequence to form one entire paper, are yet worthy of being "jotted" down, I bring you the first instalment of a series of short papers to be introduced from time to time by one or another member under the head of

PHOTOGRAPHIC JOTTINGS.

No. 1.

The first I will offer is upon *Carbon Printing*.

M. Asser, of Amsterdam, has recently published a process of printing in lithographic ink. I will shortly state it for the benefit of those who may not have read his instructions. [For particulars detailed see page 283]. Mr. Shadbolt, in The Photographic Journal of the 15th inst., in noticing this process states that he has for some time entertained a scheme founded upon one of the photo-lithographic processes, in substance the same as that of M. Asser.

I have not had time since the publication to try either of the above; but I will give you the result of some experiments I made last year in a similar direction.

Mr. Sutton once stated that if a piece of paper be coated with gelatine and a roller charged with printing ink passed over it, on after-immersion in water the whole of the ink would come off, and the paper appear quite clear. Acting on this hint, I took a sheet prepared for iron printing, that is, coated with bichromate of potassa, ammonia, citrate of iron, and albumen. I employed this because I had it by me, and, after exposure under the negative, gave it a coating of printing ink *before* fixing in water; but although I succeeded in getting the high lights perfectly clean, and indeed produced a very fair copy of an engraving, I could not manage the half-tones. A little perseverance might have overcome the difficulty, and I purpose renewing my experiments. In

a second case instead of ink I used plumbago, blackening the paper with it after exposure, but was not over successful. The following plan answered better:—The sensitising mixture had sufficient albumen, gelatine, or gum with it to give a glaze when dry. Exposing and fixing in water as before described, I obtained a print sized in the parts which had come under the influence of light, but unsized in those portions protected from it. When dry it was coated with plumbago by the help of a soft stump. Holding before the steam from a kettle caused the size to retain the black-lead in contact with it, whereas the whites being perfectly unsized the plumbago was easily removed therefrom by using stale bread; friction is, however, objectionable.

I will now offer a few suggestions respecting the above process of M. Asser. In the first place it will require delicate handling, to say the least, to pass an inked roller over plain paper saturated with water so that no ink may adhere to it: perhaps first soaking it in strong alkali, so as to remove any substance having an affinity for grease, would be an advantage. Finger marks, for instance, might be imperceptible to the eye, but they would show as soon as they came in contact with the ink. This difficulty, if indeed it proves one practically, would refer more to Mr. Shadbolt's process than to that of M. Asser; for the latter sized the surface of his paper with starch, which appears a matter of some importance. If used very thick, so as to form a crust on the paper, it would have more the properties of lithographic stone.

The graduated drawing-boards sold by artists' colourmen have a surface of body colour which might render them of use in this process; they may be procured plain, of a very light colour.

One hint more and I have done with the subject for the present. Lithographic printers are in the habit of mixing gum arabic with the water to keep the stone damp, as it is found to repel grease much more completely than water alone. It might be advantageous to add gum and, perhaps, a little nitric acid to the water with which the paper is kept saturated whilst being inked.

Photo-engraving.—As hints on this subject are always acceptable, I give the following very rough "jotting" of a process by which I think something may be done. Last spring I coated a steel plate with the iron solution used in my iron printing process. Bichromate of potassa and gelatine answers the same purpose. The exposed plate was immersed in nitrate of silver, when chromate of silver was formed on the parts which had not been acted on by light. The plate could now be bitten into by acids, hydrochloric for instance.

If instead of steel a copper plate be used, and after immersing in the silver it be washed so as to remove the film, an impression is obtained somewhat resembling a daguerreotype, reduced silver giving the shadows and the unaltered copper the lights.

Mr. Howard: As regards the want of half tones in the method of carbon printing alluded to by Mr. Hannaford, having had considerable lithographic experience, he could say that half tones were not to be produced on a smooth surface. If you pass the lithographic roller over any smooth surface, the ink must adhere to all parts in a uniform manner; that it was necessary in lithography, if you wanted half tones, to have a roughened or granulated surface, as the ink then only adhered to the projecting and prominent portions, forming a series of irregular dots.

Mr. Wall would venture to put forward a singular fact as another "jotting," which in these days, when photographic portraits are received in our courts of law as evidence to prove identity, might not be unimportant, although he would not for an instant infer that such evidence should be doubted. The two photographic portraits he now placed before them were beyond doubt of two perfectly different men, and yet they were so alike that he had much difficulty of convincing many of the fact.

Mr. Leake said, although the hour of adjournment had already come and gone, he would, with permission, detain the meeting a few minutes longer, as he had a communication to make which might prove important. He had been much annoyed by a new sample of glass (patent plate) called German. His usual cleaning solution, consisting of cyanide of potassium and tripoli, had not the least effect, and another plate-cleaning solution, warranted to clean anything, was equally impotent. Both these solutions were perfectly effective with other glasses. He found, also, that the exposure was with this glass much longer. A deposit made its appearance between the glass and the collodion during development, and the picture produced was misty and full of stains. Moreover, after drying, the film in most instances split and came from the plate. He had tried experiments with the same cleaning solution, bath, and developer on the same day, using other glasses, with excellent results.

Mr. Wall said he understood that there was a large and increasing demand for the glass in question; the wholesale houses, he had heard, were buying largely. In his own establishment they had willingly purchased, for it was cheaper and to all appearance better than that they had previously obtained. The matter therefore was one of importance. As he had witnessed Mr. Leake's experiments, he could vouch for them.

Mr. Herve stated that he once met with similar difficulties from purchasing a glass called in the trade "jam glass," and made in Germany. He attributed it to the presence of lead in the formation of the glass.

The President suggested an experiment to test the specific gravity of various specimens, with reference to their photographic qualities, and then announced for the next meeting, on Thursday, December 15th, a paper entitled *Practical Observations upon Photographic Productions in their relation to Art*, by Alfred H. Wall, Hon. Secretary.

Mr. Leake promised to fill up any space which might be left unoccupied, by bringing down a few more "jottings."

The following gentlemen were then elected:—Mr. J. Williams, Mr. T. Clarke, Mr. G. S. Tear, Mr. W. Lovett, Mr. J. Martin.

Mr. Herve proposed a vote of thanks to the Chairman, which was heartily awarded.

The meeting then adjourned.

CALEDONIAN PHOTOGRAPHIC CLUB.

This Club, which was instituted for the purpose of diffusing among its members information on *practical* photography, held its first meeting, in Edinburgh, on the evening of Saturday, the 12th ultimo.

Mr. M'Naughton was called to the chair.

After the usual routine business consequent on the formation of a new body, the following gentlemen were elected office bearers:—

Secretary — Mr. Andrew Wilson.
Treasurer — Mr. Roderick M'Nab.

The Chairman then addressed the members at great length on the peculiar circumstances under which they were now met; and he hoped that, now their little barque was fairly launched under such auspicious circumstances, each member would guard against any act which might lead them into the unenviable position of being regarded as the schismatics of another Society. Indeed, from the well-known characters of the members, he predicted with confidence that this Club would be a great success. He dwelt on the advantage to be derived from that peculiarity of their constitution which prevented them admitting any new member who had not satisfactorily undergone a searching examination in the practical details as well as the theoretical principles of their beloved art, as they were desirous that the practical and useful should not be sacrificed to the merely theoretical and ornamental. Still, while their aim was strictly practical, they would not despise theoretical knowledge.

He concluded by hoping that in any discussions on subjects brought before them, mere speech-making would be avoided, adopting in preference a free and easy conversational style.

Mr. Brown said, I propose that one feature of our meetings shall be, that some member, Mr. Turnbull for instance, shall procure and detail to us an account of what takes place at the meetings of the principal Photographic Societies in Britain—such as the London, North London, Liverpool, and Scottish Societies; and that a sum of money be set apart, if needful, for the purpose of procuring accurate reports.

This was agreed to, and Mr. Turnbull authorised to make the necessary arrangements for carrying out the proposition.

Mr. Wilson said "he was glad to be in a position to give them reliable information as to the recent proceedings of the Liverpool Club [as these proceedings have already appeared in a preceding number of this Journal, we think it needless to reprint them here. Ed]. He could also furnish them with an account of what took place at the last meeting of the Photographic Society of Scotland, procured partly from the local papers and partly from private sources. The chair (according to the *Scottish Press*) was occupied by Mr. Scott Eliot. Mr. Alex. Munro, of Craiglockhart, and Mr. R. Struthers, were elected ordinary members. After the usual formal business, a *conversazione* took place, at which were exhibited several improved cameras, and other photographic apparatus, as well as collections of photographs from Rome, France, and elsewhere. Mr. Walker gave an account of what he saw on a recent visit to London. Stereoscopic pictures seemed to hold the chief place among photographs. He described some portable cameras and tin

preservative cases for excited positive paper which he had seen—some of which cases he (Mr. Wilson) might state were to be laid on the table at the next meeting of the Caledonian Club.—Mr. Walker's remarks were well received, and led to some conversation. The subject then turned on the recent testing of lenses, on which there was some animated discussion. Two of the members of that Committee who were present defended the report in every particular; and characterised the "triplet" form of lens as the best they had tried, notwithstanding that it had been procured from the stock of an optician in this town; whereas some of the others had been procured from the makers, with a special view to this testing. This was a fact that should not be lost sight of. During the evening it was stated that there was every prospect of the Society's exhibition, which is to be opened in the middle of December, in the large room occupied by the exhibition of last year, No. 90, George Street, being the best that has yet been held by the Society. In addition to the works of members, contributions have been offered from most of the photographic artists of this country, and interesting and valuable collections from India and Australia have likewise been promised. The attendance was not very numerous, indeed scarcely more than were now present."

A conversation on this report ensued, in which Mr. MUNDELL said that if he had been on that Lens Committee he should not so quietly have submitted to the would-be-snubbing remarks of one member of the Council of the Society—although that gentleman had had small cause to rejoice in the success of his attack. He thought that this Committee had done much good by causing the subject to be more inquired into. He called on the Secretary to put down his (Mr. Mundell's) name for a paper on lenses at the next meeting of the Club.

The SECRETARY said they would be happy to have his paper, but he was afraid they would not do justice to the discussion on it at the next meeting, as Mr. Williams was to read a paper on *Transferring collodion positives from the glass plates to leather, cloth, &c.*, which was to be accompanied with numerous illustrations; however, if they had time, they might accomplish both on that occasion.

Mr. MONTAIGNE said, you must really allow me a word or two on the Report alluded to. The members of that testing Committee acted a most strange part in saying that the triplet lens (which by the way is scarcely Sutton's triplet after all, for it was made by Goddard, who in his construction of it introduced some *new* features, which, in my opinion, render it superior to Sutton's published description, and susceptible, too, of allowing its being made vastly lower in price)—well, I hold that the Committee had no right whatever to say that this lens gave the best results; for it is a notorious fact that the *best* pictures were produced by that lens, not as it came from its maker, but after it had been disfigured by being sloppered around the edges with black varnish, velvet, &c., which Mr. Tunny, in whose possession a friend of mine saw the lens, assured him had been found absolutely necessary to be done in order to get intense shadows by shutting out the flare from its numerous surfaces. What right then had they to call it Sutton's lens? I hold that this should have been explained in the Report.

Mr. BROWN: I think that Mr. Montaigne's remarks form no case against the Lens Committee. I, too, called and saw the lens, and think the Committee acted wisely in blackening the edges of the glasses, as the lens was said to be one of the first made on that model, and I think such a storm need not be raised against what is such a simple matter. Individually I disapprove altogether of compound lenses for landscapes, preferring the old meniscus form: little or no distortion, even in architectural subjects, is got by it, provided it be not forced by taking too large a picture.

Mr. STEELE: I think it a sheer waste of our valuable time at present for members to be haggling away at the affairs of another Society, against which conduct I protest.

After a protracted conversation on the best way of conducting the business of the Club, it was at length resolved—"That no new member, be his qualifications what they might, should be admitted to the Club, until there was a vacancy in their circle from the death or resignation of any of their members."

Mr. M'ADAM moved that arrangements be made for having an exhibition, and that a medal be struck for a prize to the best artist.

The discussion on this was delayed till next night of meeting.

Also proposed and deferred—

"That the editors of the various photographic periodicals be elected honorary members."

There was a full attendance, and after the usual vote of thanks to the chairman, the meeting separated.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VI. *(Continued).*

PIGMENTS.

The pigments which are most eligible for water have already been fully described. It is well to become thoroughly acquainted with the power your pigments possess in combination, and a little time devoted solely to the compounding of hues, shades, and tints will by no means be thrown away. Pigments are prepared moist in pans and tubes, and in dry cakes. For large washes I prefer the moist colours, in pans; for the more delicate colours, those in dry cakes; and because the madder pink generally comes too slowly from the cake, and yet must be preserved pure, I choose this moist in a tube. Select the following colours:—

Madder Pink	Gamboge	Sepia
Crimson Lake	Yellow Ochre	Vandyke Brown
Purple Madder	Naples Yellow	Neutral Tint
Brown ditto	Indian Yellow	French Blue
Vermilion	Raw Sienna	Cobalt
Extract of ditto	Burnt ditto	Indigo
Light Red	Lemon Yellow	Prussian Blue
Indian Red	Cadmium	Ivory Black.

For the chemical and other qualities, peculiarities of working, &c., of the above, see the chapter on colours as pigments.

GUM.

A solution of gum in distilled water, one part of the best white gum and seven of water, to which add a piece of loaf sugar about half the size of a filbert.

PREPARED OX-GALL.

This is generally used to destroy the effect of grease on the surface of your paper: it is used with the water.

WATER.

It is essential to obtain this free from such ingredients as would injure your pigments: spring or mineral water would quite destroy the more delicate vegetable colours, therefore use rain or distilled.

PREPARATORY PRACTICE.

To acquire perfect freedom of hand and a dexterous method of using the brush must be your next aim; and to acquire this I do not know that I can recommend any better practice than what is known among photographers as "touching" (which is a method of "working up" photographs on plain paper in indian ink, sepia, or a mixture assimilated to the colour of the photograph). Inasmuch as you will find that errors of execution are more readily detected, and consequently remedied, in the use of one colour than many, I shall therefore include a lesson upon this subject, although I hold that a good untouched picture is greatly superior to the touched, for truth of texture, *chiaroscuro*, and general effect.

The native truthfulness of a good photograph is so superior to the smoothness and laboriously stippled prettiness of an india-ink drawing, that creating the last upon the first seems to me a display of the most erroneous judgment and bad taste. The excuse generally tendered for the "touching" of photographic portraits, or, in other words, for making them resemble india-ink drawings, is, that it gives them *finish*, by which is evidently meant *smoothness*. But Mr. F. Howard shall say a word upon this subject in the following quotation from his chapter upon finish in "Imitative Art":—

"This [finish] does not consist, as appears to be a prevalent erroneous notion of the present day, in smoothness of surface, or tea-boards would be the most finished productions of art. Sir Joshua Reynolds could not be said to have finished any of his pictures; texture would be worse than of no value; but varnish would be the artist's best friend. Nor does finish consist in another kind of smoothness, which results from the careful blending and softening of all the touches, so that the method of execution shall not appear. Nor does it consist in minute detail, but in *the complete expression of character*."

In this sense what can be more finished than a perfect untouched photograph? Does it not indicate in detail every variety of texture, the rough, the polished, the smooth, and all the varied surfaces of nature?

In touching, therefore, aim not to smooth and even up the tints and shadows, but rather to preserve and strengthen every trait in the photograph, more particularly if, as I recommend, you merely commence this branch as an introductory study to that of colour.

A pale print of a cold tone is best, if you intend to finish in india-ink; a warm or cold brown, if you intend to touch with warm or cold sepia; and, if you please, you may compound a tint resembling that of the photograph, which, if it be of the usual purplish-black,

may be got with madder purple and india-ink, or madder brown and india-ink, to which, if necessary, may be added a little indigo, or a little indian-red, lake, or burnt sienna. Let the print be upon plain salted paper — not albumenised.

Having selected your photograph, and mounted it upon Bristol board — which, having a hard, smooth surface, is best for the purpose — size it with parchment size, and let it be "rolled," that is to say, pressed with very great force between cold steel cylinders. Any hot presser will readily do this, and the process not only improves the smoothness of the surface, but so hardens it that it is not easily disturbed.

Your colour mixed (clean water and hair pencils being ready), pin down your picture upon a drawing-board; imagine your teacher at your back — resolve to gratify him, and raise yourself in his estimation, and commence.

With a touch so faint and light that it is only after several applications that you can perceive its effect, begin to strengthen what I will call the outlines — although in a good photograph, as in nature, *there are no outlines.* To put in these *apparent* lines *at once* would be to produce distinct lines, resembling nothing else but lines, which is a very common mistake, not only with beginners, but with some who pretend to professional experience.

The author of the preceding paper has, in order to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

G. Daintree.—Yes, with much pleasure.

James Pearson.—The print is too dark and too thick for colouring.

Alfred Teague.—The tints are rather too pure. Your progress flatters me.

Ellen Green.—You need nothing but more practice. When the paper is roughened by pumice-stone powder a closer resemblance to crayon drawing is the result; but it is certainly easier to work upon a very smooth surface, which is obtained by hot-pressing. On rough paper the colour is rubbed into the grain — on smooth it is on the surface only.

Poor but Proud.—Did you know you were writing to "a mere photographic colourist?" I hope not; for then this lengthy epistle would be *an insult.* I will *condescend* to give you a more lengthy reply than you deserve, because I recognise you as one of a very large family which we workers in the hive call *drones.*

Why should that which would degrade you not degrade me? Is enervating idleness and mean and unmanly dependence so *very* superior to "the glorious privilege of being independent," that you hesitate to exchange the latter for the former? Examine what you call your "pride:" it had its origin in the possession of a thing which as often dignifies vice and folly as not—viz., money; but you are poor — you have lost the substance, and hope to retain its shadow — you would deceive the world by exhibiting your pride in — *nothing* (for that which was and is your pride exists no longer), in order that the world may believe your nothing to be something, which *in itself* can neither improve your mind, expand your heart, or confer any real honour or advantage. Oh! cease to contemplate the shadow, and eat your bone; and, if you have sufficient talent (which the specimen sent does not however indicate), you may bless the day when, with or without my aid, you became a "mere photographic colourist," and threw overboard both your own scruples and those of your "very highly respectable family." Pardon my bluntness — you will not find me a less zealous instructor.

Letters to a Young Photographer.

No. XXIV.

My dear Eusebius,

You must be careful to keep your sensitised paper out of the influence of light and atmosphere. Some photographers make use of a pressure-frame for that purpose, which answers very well: others employ Marion's preservative cases, which is the best contrivance that I have seen for keeping sensitised paper in. Papers impregnated with wax, gutta-percha, belmontine, or paraffine, do not decompose near so rapidly when sensitised as plain paper does; for these substances not only make the paper translucent, but also protect its fibres from the decomposing action of nitrate of silver. I think it advantageous to put each sheet of sensitised paper between white blotting-paper, which prevents the waxed-paper from creasing when put into a pressure-frame.

If the waxed-paper be put under glass when exposed in the camera, the time of exposure will be prolonged. The paper may therefore be mounted by gluing the edges on to a piece of Bristol board while it is damp; it will contract upon drying, and strain perfectly tight and smooth.

The exposure in the camera will of course depend upon so many contingencies that it is impossible to give any rules, special or general. You may under very favourable circumstances obtain a picture in two minutes, at others in half-an-hour, and on some occasions an hour may be requisite. Only judgment based upon experience will serve you as a guide in this part of your operations. In architectural subjects a tolerably long exposure is necessary to obtain the details which are in shadow. As a general rule, waxed-paper pictures are under-exposed by inexperienced photographers.

After exposure in the camera the developing may be deferred for several days, although it is best to effect it within twenty-four hours.

The picture is generally invisible when the paper is removed from the camera, especially if it has been well washed when removed from the bath; sometimes, however, the sky and high lights are visible, distinguished by a light red tone. Plunge the proof into a solution of gallic acid.

Gallic acid	2 grains.
Distilled water	1 ounce.

Filter, and add about two drops of aceto-nitrate of silver, or two drachms of the water used for washing the paper after it has been taken out of the sensitising bath, and immerse the proof completely in the mixture, facilitating the immersion by the use of a glass triangle. Shallow glass dishes are best for developing proofs: they must be kept scrupulously clean, and rubbed with blotting-paper previous to using them.

The image should develop gradually, and not more than two proofs be put into the same bath, placed back to back; but it is still better to put in only one. The proof must be placed in this bath immediately it is prepared, else it will become covered with a veil of precipitated metallic silver, and lost; therefore the paper should be put into it with the picture downwards, so that any precipitate that forms may fall on the back, from which it can be removed with a weak solution of cyanide of potassium.

As it is very troublesome to be obliged to mix solutions of gallic acid every time they are required, since they will not keep if prepared beforehand, you can employ an alcoholic solution of gallic acid, which will keep any length of time, and add such proportion to water as will constitute a bath of the requisite strength: say two grains to the ounce of water.

You will soon be able to ascertain if the exposure has been correctly timed, by the behaviour of the proof under development. If the development has been too long, the picture appears all over with great rapidity; but it will not take an uniform tone and vigour. This defect is the more to be feared when the layer of iodide of silver is very thin. If, on the other hand, the exposure has been too short, the paper becomes completely opaque before the half-tones have had sufficient time to appear. Such pictures are too harsh in tone and contrast to be tolerable. You may always judge of the vigour of a proof in examining it by transparent light; for, after it has been immersed some time in the bath, the surface of the paper frequently acquires a general grey hue, and you would consequently think your proof lost did you not know that this is a sign of complete success.

The time necessary for the development of a proof is extremely variable, and you must be satisfied if it proceeds slowly. Slow and sure is your motto. It greatly depends upon the temperature and upon the quantity of silver contained in the bath. It may vary from half-an-hour to two hours, or even more. The proof must be carefully watched, especially as it approaches completion, for the blacks increase in intensity very rapidly, and you must stop the developing when the darkest parts, which represent the lights in the positive, have become almost opaque. Upon the just appreciation of this point all the beauty of the proof depends, and you must acquire the power of exercising it by practice. Of course you will have to make some allowance for the weakening the picture undergoes in the fixing bath.

You will stop the developing by taking the proof out of the gallic acid, and washing it several times in filtered rain water, and soaking it for several hours in water, before you attempt to fix it. If the proof be soaked in river or spring water, the latter becomes, after a time, of a deep green colour, arising from the action of the gallic acid upon the salts of lime contained in the water in contact with the atmosphere.

The proof, when dried, after proper washing, is no longer liable to alter, or but slightly; and it may be kept in a portfolio until it is convenient to fix it, which is a great advantage while travelling, as the intolerable hypo' may be for a time dispensed with.

To fix a proof, make the following solution:—

Hyposulphite of soda	8 ounces.
Water	1 ounce.

This bath will dissolve out the salts of silver which do not form the image. It is best to put only two proofs at a time into it, and watch them attentively for about half-an-hour.

This operation should be performed in broad daylight. It must be continued until the yellow colour of the lights of the image disappears. This yellowness is due to the presence of iodide of silver remaining in the pores of the paper. The proof must be washed in filtered water several times on being taken out of this bath, and then allowed to soak some hours, changing the water occasionally. It is then fixed, and may be dried between blotting-paper.

The fixing is a most important operation in this process. The immersion of the proof in the hypo' must be prolonged to the utmost, consistent with the safety of the proof, so as to make sure that all the salts of silver are removed. It often happens that a proof, supposed to be well-fixed, becomes yellow after a time in the printing frame, and, consequently, injures the quality of the positives taken from it. Whenever this happens, the only remedy is to put the proofs into a fresh bath of hypo'. Upon becoming dry the waxed-paper assumes a dull and granulated appearance, not at all captivating to the photographic eye, but it entirely disappears when the paper is gradually warmed at the fire.

The proofs can also be fixed in a bath made as follows :—

Bromide of potassium	1 drachm.
Filtered water	6 ounces.

In a chemical point of view this fixing solution is bad, because it does not dissolve out the salts of silver. It destroys their sensibility, it is true, but it leaves the yellow iodide of silver in the paper, which is injurious to the taking of positives. When the proof is very weak it is, however, better to employ it than to risk weakening it still more by hyposulphite of soda. Bromide of potassium may be replaced by a saturated solution of common salt.

The chief point, as you will see, you have to avoid is that of allowing your proofs to become yellow. This is likely to occur when the developing bath contains too much gallic acid, or when it has become thick from impurities. Hypo' has no effect upon this yellowness, which becomes red in the course of time. They hoist a yellow flag at quarantine-stations when the plague prevails; take you good care not to hoist the yellow flag, else you will be plagued indeed.

Photographic Glossary.

Varnish for Negatives on Glass — Varnish for negatives must possess the following properties: — It must be colourless, dry quickly, and be free from tackiness; not easily abraded or scratched, and not soften by the heat of the hand, or by exposure to the sun; it must be pliant and adhesive, so as not to scale off the glass. And the best resin to secure these results is *lac*, mixed with a small portion of a soft and unctuous resin, such as elemi.

The following formula will answer the desired aim :—

White lac	12 parts.
Elemi	3 ,,
Powdered glass or sand	10 ,,
Alcohol	100 ,,

Put the bottle containing these ingredients, tightly corked, into a warm water bath. When the resins are dissolved, clarify with ivory black, and filter through paper.

Although this varnish may be slightly coloured, it is not objectionable, but rather advantageous, as the half-tones are protected by it, and a clearer proof is the result.

The addition of oil of lavender or of rosemary is not essential, although sometimes recommended. They serve to impart an agreeable odour.

The lac should be first broken into very small pieces, and put into a moderate oven to dissipate all the moisture it is apt to retain in the process of bleaching.

Foreign Correspondence.

Paris, November 25, 1859.

In the present dearth of original photographic discovery, I think I cannot do better than communicate to you an account of M. Robiquet's researches upon the rays of the solar spectrum, and of the various electric spectra. Frauenhofer thought that the rays of the different spectra were dependent on the constitution of the luminous source in which certain kinds of rays were completely wanting. It remained to ascertain the cause of this absence of light. We may attribute it to an effect of interference; for upon receiving the image of a solar spectrum on a screen, and placing before it, very near, a thin plate of mica, none of the rays are modified. So also, if we divide in two one of the two rays H with the vertical edge of the same plate of mica, there is no illumination in the masked portion. The existence of the rays of the spectrum is due to an entirely different cause, which may be explained by the following experiments :—

If, as Dr. Draper has done, we produce a spectrum with a flint prism, and a platinum wire rendered incandescent by an electric current, this spectrum has no rays; but if we place between the prism and the wire a glass cylinder terminated by parallel plate-glass faces, and filled with the vapours of hypo nitric acid, the rays immediately appear. Supposing Frauenhofer's spectrum to be superimposed on the preceding, we perceive the new rays disposed as follows :—

Extreme red (B and C).—A group of very fine rays, very numerous, and nearly equidistant.

Red (immediately after C).—Two very clear rays.

Limit of the orange and yellow (a little before D).—Four distinctly marked rays, especially the third. The ray D is found in the new spectrum, and is the only one among Frauenhofer's rays that is.

Yellow (between D and E).—Three equidistant rays.

Greenish yellow (a little before E).—Two very strong rays.

Green (between E and F).—Two groups of very fine and compact rays, forming rather two obscure bands.

Bluish-green (before and very near F).—A group of very fine, numerous, and clearly visible rays.

Blue-violet (F and G) and *violet* (G and H).—Six groups of numerous, almost invisible, rays.

In substituting the vapour of iodine and bromine for the nitrous vapour, the rays change their nature again. With dry chlorine there is not the slightest appearance of rays. Even with a tube fifteen feet long there is only a light illumination in the green part, and especially in the yellow portion of the spectrum.

The effect obtained by the platinum wire is also produced by other metals; those experimented with being iron, silver, gold, aluminium, copper, sodium, potassium, and chromium. All these metals were melted and volatilised by the current of a strong pile by suddenly breaking the interpolar communications, and the incandescence continued long enough to admit of the phenomena being distinguished, if not analysed. These observations confirm the anticipations of M. Foucault, who, in remarking that the spectra from the carbon points brought to a white red exhibited no rays, and concluded it must be the same with all incandescent bodies.

Other experiments agree perfectly with the preceding. When we observe the spectrum produced by a horizontal gas jet, and by means of an opaque screen furnished with a very close shutter, and arranged in such manner as to allow only the blue portion of the rays to fall upon the prism, we see the ray D very distinctly, two fine green rays separated by a black band, three blue rays, and lastly, four violet rays. The same phenomenon is produced, but very much feebler, with the brilliant portion of the flame. Upon repeating the same experiment with a gas jet pierced with twenty holes, furnished with a glass chimney, only the feeblest sign of rays can be distinguished, in whatever way the brilliant or the blue portion of the flame is placed.

The appearances that the spectra produced by the metals volatilised under the influence of the electric current are extremely curious, and the theory of the preceding phenomena is entirely applicable to them.

M. Foucault, in a memoir published in 1849, has studied these spectra in a general manner, and arrived at very important results. M. Robiquet began by repeating M. Foucault's experiments, not with the view of verifying their accuracy, but to accustom himself to such delicate observations before proceeding to examine the metallic arcs, the spectra of which had not yet been examined. The following are the appearances presented by the arcs of the following metals : —

Platina. — Burnt with a white light. The ray D existed. All the parts of the spectrum were covered with very narrow black bands, allowing the different colours to be seen between them as between the slats of a Venetian blind: these interstices appeared as very large brilliant rays, among which could be distinguished, in the following colours,

Red, six rays; *orange red*, three rays; *green*, four groups of very fine rays; *indigo*, two rays. All these rays possess dazzling splendour. In the *violet-blue* ray an absorption almost complete

was observed: in the *violet*, three very luminous large bands, and in the *extreme violet*, two large dark rays, corresponding to the two rays H of the solar spectrum.

He also operated with aluminium, gold, chromium, copper, silver, sodium, potassium, strontium.

The photographic representation of all these spectra is difficult, except with silver and sodium; the metallic arc has so little steadiness that there is the greatest difficulty in obtaining images in which the rays are not every moment displaced.

We cannot give iodised collodion an exposure of more than four or five seconds, insufficient to obtain an impression of the magnificent ray D from sodium, the blue rays from aluminium, the two green rays from silver, and the magnificent red bands from chloride of strontium. All these colours are very slightly photographic, notwithstanding their brilliancy; but starting from the last violet rays, two or three seconds suffice to obtain a satisfactory negative, and, what is very remarkable, we observe in this spectrum, which is invisible to the eyes, but which so strongly impresses the iodide of silver, rays and bands which remind us, by their arrangement, of the coloured part of the spectrum to which they belong.

The brilliant rays of the electric spectra produced by the different metallic arcs must not be confounded with those of the spectra engendered by the electric spark, and which are due, as M. Masson has shown, to the material particles brought by the electric flux to the state of incandescence and transported through the space which separated the extremities of the conductors. It may happen that rays from the carbon arc are only secondary rays, due to the separation of the silicious particles which always exist in so large a quantity in the best prepared crayons.

Lastly, photographic proofs were obtained of the solar spectrum produced by a system of lenses and prisms: first, of rock crystal; second, common flint; third, Faraday's flint. In the first case all the obscure rays were temporarily seen; in the second, nearly one half were wanting; and in the third, almost all.

The conclusions to be arrived at from the above are, that every incandescent body, whatever its chemical nature, gives a spectrum without rays; if this body, in volatilising, surrounds itself with colourless and transparent vapours, still the rays do not appear; but if the vapours produced are heavy, quickly condensable at the ambient temperature, and still more, if they are at the same time colourless, they intercept a portion more or less considerable of the total radiation.

To explain the action of these vapours, it is best to compare them on a screen in the form of a grating, the bars of which, unequally spaced, must be of considerable diameter, and of extreme thinness. In the first case, the shadow projected shows itself in very fine dark rays (rays of the solar spectrum); in the second, the masked rays are in considerable number: true obscure bands are produced, in the interstices of which the luminous and coloured parts appear as brilliant bands or rays (spectra of the metallic arcs produced by the pile).

When the spectrum is formed by the incandescent particles transported mechanically, either by the electric flux of the pile or by the spark, brilliant secondary rays appear, very easy to recognise by their intermittent character.

The invisible portion of these different spectra undergoes the same effects of absorption as the visible portion, and the effects may be rendered visible by photographic processes.

M. Robiquet fully understands that this task is far from being completed, and he hopes to be able to devote himself to its study, being so nearly allied to that of the nature of light. It is necessary to construct special delicate apparatus to enable him to count with precision the rays of the different spectra, and measure the reciprocal distances, and to obtain by processes still more delicate and sensitive photographic proofs of all the parts, visible and invisible, of the spectra, produced by the light of the stars, and by the electric light. J. P.

Correspondence.

TONING.

To the Editor.

Sir,—Would you be so kind as give me the best formula for Mr. Maxwell Lyte's toning-bath? I am in the habit of toning about four prints, eight-and-a-half by six-and-a-half inches, daily. I employed the formula given in the March number of the Journal, but to soak a print in that solution, say five ounces, and not use it a second time, is very expensive.

To use the alkaline toning—gold one grain, soda ten grains, water five ounces—produces red spots in the paper, and upon adding the hypo' the print loses all brilliancy. Before I toned the enclosed print it was all I could wish it to be. Out of the last quire of paper I may say I have not had one good print. I have toned some excellent pictures with the same formula, but the two last quires of paper produced results like the enclosed. If you can spare a few lines in the next Journal I shall feel obliged.—I am, sir, yours, &c. M. A. H.

[Dissolve eight grains of chloride of gold in half-an-ounce of distilled water. Neutralise any acidity by adding solution of carbonate of soda, then make up the quantity, by the addition of water, to one ounce—each fluid drachm will then contain *one grain* of gold salt, which will be quite sufficient to tone you four proofs.

When about to operate measure out the quantity of water that you find sufficient to allow of your prints being comfortably immersed, then dissolve therein about thirty grains of phosphate of soda, and add to it the drachm of gold solution. Immerse the proofs, after washing out the free nitrate of silver, and allow them to remain till properly toned, then fix.

No doubt it is the paper that you have been using that is in fault; but you must remember that a free alkali dissolves out the size, which the phosphate of soda does not. We notice also that the tone of your specimen is cold and flat: this may be partly owing to too long immersion in the gold bath, from which it should be removed as soon as a full purple hue is acquired; and although it may look reddish after the fixing bath *while wet*, you will find that on drying it becomes blackish.—Ed.]

STEREOSCOPY.

To the Editor.

Sir,—Having very frequently met with individuals who do not see equally well with both eyes, I begin to believe that there are few persons in whom the sight of one eye does not differ from that of the other—often in focus, but more so from defect in vision; hence, while so much is said of the beauty presented by pictures as seen through the stereoscope, the number of those who can appreciate this beauty is exceedingly limited. Many do not know that they possess this defect, till by some chance it is revealed to them; others know, but do not admit the fact, as no difference, without minute examination, can be discerned in the appearance of their eyes.

The business now for all who believe in the stereoscope is to examine their eyes, and if the truth is told, I am satisfied that the question I have advanced will no longer be doubtful.

I am yours, &c., R. S. D.

24th November, 1859.

[We do not perceive that the allegation "that there are few persons whose eyes are both of similar focus," even if well founded, affects the question at all.

The stereoscope presents pictures to each eye, as in nature, or should do so. *If* natural objects are viewed by eyes differing in their focus, so should stereoscopic ones be viewed.—Ed.]

WHICH IS THE *BEST* PRESERVATIVE PROCESS?

To the Editor.

Sir,—I am an amateur photographer, desirous of ascertaining which is the best preservative or keeping process.

From the flaming advertisements and accounts published in the various journals relative to some of the keeping processes I have been induced to try first one and then another; but I have not found the results come up to the accounts given of them.

Now, Mr. Editor, I do think you would be rendering photographers great service if you could induce some of the parties who "write up" their processes so highly to show the public, at the next Photographic Exhibition, *some of their works;* for I must confess that, although I *read* and hear very high characters applied to certain of the dry processes, I have hardly ever seen photographs by them even come up to mediocrity, but certainly bearing no resemblance to the pictures we are led to expect.

In going through the catalogue of the present year's Photographic Exhibition I find only five exhibitors (out of nearly one hundred) who operate by the dry or keeping processes on glass—viz., one by the oxymel, one by the honey, and three by the collodio-albumen, or modification thereof.

It seems very singular that the process advertised, "which gives results equal to any wet, and superior to all other dry ones," should not have afforded one specimen; is it because they are too choice for common eyes to look upon? or is it because the parties recommending the process do not feel quite confidence enough to trust their specimens before the scrutinising eye of the public?

Hoping to see in the next Photographic Exhibition pictures printed by the silver process, from dry or keeping plates, equal to those printed by the carbon process (in the journals),—I am, yours, &c.,

AN ENQUIRER.

[A fair challenge, which we trust will be responded to. The writer of the preceding letter is a sceptic as regards the Fothergill process, when compared with a certain other dry one—in which he is a most skilful manipulator. We like to compare results, and think such a proceeding highly advantageous; but we have *no doubt* that the Fothergill process can yield negatives quite equal to any other. Indeed we are convinced that *all* the dry processes can be made to work satisfactorily.—Ed.]

ALABASTRINE PHOTOGRAPHS.

To the Editor.

Dear Sir,—My esteemed friend, Mr. G. W. Simpson, having sent me the enclosed note, in justice to myself and him permit me to ask the favour of its publication. With regard to the permanency of the pictures in question I must add that Mr. Simpson has shown me pictures in a perfect state of preservation which I remember to have seen at least two years ago. In referring to the bi-chloride of mercury process I still hold the opinion I have expressed; but, with regard to my friend's modification (both in tone and permanency), I must say, that results would seem to warrant a more favourable verdict.—I am, yours, &c.

90, *Cannon Street West, City.* ALFRED H. WALL.

My Dear Wall,—I have just seen your remarks, in answer to "Alabastrine," in the last number of The Photographic Journal, in which my name is mentioned in connection with the alabastrine process. Will you allow me to define my position in that matter.

The modification of the bi-chloride of mercury process, which gives a pure white tone instead of the cold blue effect produced by bi-chloride of mercury alone, and the materials for the production of which are sold by Squire and Co.,—this modification, together with the term which describes it, namely, the "Alabastrine Process," was really "invented" (shall I say) by me.

You have not heard me claim the "invention," because I have always shrunk from displaying the petty vanity I have often seen, and always deplored, of claiming the credit of "discovery" and "invention" for modifications, however valuable, of the discoveries of others. The process cost me some time and money in perfecting, and I derive some compensation from the sale of the preparations. With this I have been content.

In regard to the permanency of alabastrine pictures, I should, indeed, be a bold man to assert of any class of photographs that they would be permanent under all circumstances; but, I may state, that I have many alabastrine photographs in my possession which have been taken for betwixt two and three years that are in no degree changed. No process, imperfectly conducted, will give permanency; but I have reason to believe that the alabastrine process, *properly conducted*, will give as much certainty and permanency as any known photographic process—in fact all the permanency that can be desired.—I am, yours, &c.,

November 22, 1859. G. WHARTON SIMPSON.

BIS DAT QUI CITO DAT.

To the Editor.

Sir,—I was too far from the Secretary at the last meeting of the London Photographic Society to hear the whole of the letter suggesting that an annual subscription should be raised for the education and general maintenance of the children of the late Mr. Scott Archer; but the purport of the letter appeared to be that every photographer should subscribe one pound one shilling or ten shillings and sixpence annually, for eight or ten years. This proposition does the author of it very great credit, more especially as a sevenfold proportion will fall on his own shoulders; but it seems to me that it is open to several very serious objections. Every one who has been at all connected with charitable institutions will bear me out in saying that it is a most difficult and arduous task to maintain even the smallest annual subscription beyond two or three years. The amount of hunting up and worrying in such cases is almost incredible. The difficulties of collection, too, year after year, would be very great. The country-town photographers are very nomadic in their habits, generally wandering about from town to town. Even in our own city how many establishments have ceased to exist within the last few years!—how many have changed hands, and how many of our first-rate men have been taken away from amongst us by death! I fear much that after a couple of years the poor collector on going his rounds would find that Mr. A—— was out, and that B—— had sold his business to C——, who did not care to subscribe; that D—— had gone to South America to photograph the ruins of the City of Pococatepetl, and so on to Y——, who had gone on an African exploring expedition, and Z—— who had gone to America for the benefit of his health, having burnt his fingers in trying the ink process on paper embossed by Her Majesty's Stamp Office. Then again we are to have Louis Napoleon for our ruler next year or the year after, and he will to a certainty interdict the art of photography, as being much too truth-telling for his enlightened government. Who knows, either, whether the collodion process may not be shortly superseded by a new and more perfect process, as itself superseded the daguerreotype. Possibly a raspberry jam, lemonade, or milk-and-water process, as it is now the fashion to seek for new photographic materials in the kitchen instead of the laboratory, may be the grand photographic climax. But to speak seriously on this really serious subject, it is much more for past than for future benefits that we are in justice indebted to Mr. Scott Archer, and the plan of an annual subscription does not seem to me the way towards endeavouring to cancel the debt.

The proposal I have to make is this, that the various photographic houses in the United Kingdom should follow the example set by numberless city firms at the time of the Patriotic Fund and Indian Mutiny subscriptions, and set by one day's receipts. Let all their operators and assistants follow the example of the city clerks, and contribute one day's pay towards the fund. This being the worst time of the year, the day would have to be fixed some three or four months hence. In the mean time let the public know that the receipts of that particular day are set apart for a charitable purpose, and perhaps they who are so assiduous in dining, dancing, concert-frequenting, playing at shop in pleasant parks, and so on, for benevolent objects, will also have their portraits taken for charity's sake. Perhaps it will be objected that photographers will not like to have their daily receipts known to the public. Well and good—perhaps they may not; but that difficulty is easily obviated by the particular amounts being communicated to the Archer Fund Committee *only*, the secretary giving each firm a receipt for their contributions, simply publishing the names of the firms, and the total amount contributed. The tardy way in which the few hundreds already subscribed have been collected is a disgrace to the photographic profession. Let us all join heart, hand, and purse to wipe away this stain on our character.

The importance of the subject is too great to render it necessary for me to apologise for taking up so much of your valuable space.—I am, Sir, yours, &c. LONDON PHOTOGRAPHER.

[We had such a superabundance of matter already in type for the last number, when the preceding letter came to hand, that we were quite unable to find room for it then; but although it has already appeared in the pages of a contemporary, the spirit in which it is written is so good that we cannot do otherwise than insert it, with every wish that it may not return void.—Ed.]

ANSWERS TO CORRESPONDENTS.

A "Note" for America.—We have no objection to our American cousins copying our articles into their journals, if acknowledged; but when the Editor of the *American Journal of Photography* in the Number for the 1st Nov., extracted upwards of twelve of its pages (being within three-and-a-half pages of its whole number) from our columns, the least he ought to have done was to acknowledge the source whence he had borrowed nearly all his matter.

Charles.—Apply at Solomon's, Red Lion Square. (See Advertisements.)

Qui Fecit.—We never heard of the feat, and, what is more, we doubt the alleged fact.

Camera.—See our leader. If *you* like to try your hand upon taking negatives on cylindrical surfaces we have no objection, but don't ask us to do so.

S. Harewood.—Put the glasses into *warm* water first, and then into *hot* water, and you will find that you can get off the varnish by rubbing with a cloth.

T. Cowell.—See the report of the Caledonian Photographic Club. You will perceive that the lens actually tested was not constructed quite according to the formula given.

F. B.—You may well express astonishment at what we are reported in the Society's Journal to have said at the last meeting of the Photographic Society. We need scarcely refer you to our own columns for what we did say, but there are doubtless many who will give us credit (?) for it.

Subscriber.—1. We do not approve of the process you mention—all the good points are mere copies of others, and some objectionable ones are introduced. It is not nearly so simply as the "Fothergill" process or the metagelatine one, which it most resembles. 2. Acetic acid in *small quantity* tends to preserve the lights of albumenised paper when sensitised, and does not act objectionably to any extent. 3. Fused nitrate of silver, if *impure*, is apt to be worse than the crystalised. If pure, it is very good for baths.

J. B. B.—There is no *work* on the subject in existence. You most likely do not focus with sufficient accuracy. Ground glass is quite unfit for the purpose of a screen: use a collodionised-sensitised glass, well washed and dried, as a focussing screen. You require a microscope to focus with, and to know how to use it. Any good collodion will do with a pyrogallic developer. You will find the paper you require in the *Journal of the Photographic Society*, November 21st, 1857. You will find, also, many points noticed in reply to "Amateur" and "Querist" in some of our back numbers.

A Lucky One.—In adding carbonate of soda to your acid nitrate of silver bath, you should have *stirred well* between each addition before applying the test-paper. It is impossible that you could have *really* required three-quarters of an ounce of carbonate of soda to neutralise the acid in sixty ounces of bath—the proof of which you yourself afford when you state that a *flocculent precipitate* filled one-third of the jar. This was *carbonate of silver*, a portion of which was dissolved by the acetic acid subsequently added. The precipitate fully accounts for the great reduction in strength of your bath when afterwards tested. The "yellow frothy mess" should have been skimmed off. That is one of the advantages of treatment by carbonate of soda. The effervescence *throws up* much of the organic impurity contained in the old bath; but if you have thrown away your "flocculent precipitate" you have sacrificed the *best part* of your stock. This should have been washed with distilled water, and redissolved with pure *nitric acid*, to convert it into nitrate of silver.

Your present bath will very likely do for "Taupenot" plates, but we should not recommend it for the "Fothergill" process. It contains nitrate of soda, acetate of silver, and nitrate of silver, and is probably but very little acid if you have correctly described your treatment of it.

In Type—"Eusebius," "T. C. B."

Errata.—In our last number an error occurred in printing Mr. J. Heywood's paper *On Toning Positive Prints*. In formula No. 3, "pure water, 1 ounce," should be "pure water, 1 *drachm*."—In Mr. Ennel's paper, page 281, second column, lines 7th and 9th from top, the word "premise" should be "*premiss*."

THE PHOTOGRAPHIC JOURNAL.

No. 108, Vol. VI.—DECEMBER 15, 1859.

With the commencement of the volume which we now complete we assumed the modification of our former title under which we at present appear, in accordance with an announcement to that effect in the last number for the year 1858. Our readers will probably remember that the editor of the *Journal of the Photographic Society* paid us the compliment of supposing that our change of title would materially interfere with the prosperity of the Journal under his management; and upon the ground that the latter was familiarly known by the designation we had adopted, issued the succeeding and subsequent numbers of the Society's organ with the words "The Photographic Journal" prefixed to the then existing title. These proceedings naturally produced a collision between the proprietors of the respective publications, and an appeal to the law appeared almost inevitable; fortunately, however, the esteem and friendship existing between the two editors was not once interrupted, and they continued to regard each other with feelings of consideration and kindness. A proposal, emanating from the representatives of the Photographic Society, to refer the matter in dispute to arbitration was at once accepted by the proprietor of this Journal, and a written statement of the case, on both sides, was drawn up and laid, many months ago, before the gentleman chosen to mediate between them.

It is an anomaly, perhaps hitherto unprecedented, in the annals of periodical literature that two distinct publications should for the space of twelve months continue to appear under the same leading title; and though differing materially from one another, both in appearance and general characteristics, it was found that considerable inconvenience resulted occasionally to both from the close similarity of the title, principally when contributors to and correspondents with either journal made references to articles that had previously appeared in one or other of them.

It is, then, with much pleasure that we have to announce that a perfectly amicable arrangement has at length been concluded between the disputants, and for the future the Society's Journal will retain its present designation, while the title of this publication will once more, and we believe for the last time, undergo a slight modification, though its aspect, arrangement, and general appearance will remain entirely unchanged.

On the first of January next we purpose greeting all our old and, we trust, many new friends as THE JOURNAL OF PHOTOGRAPHY, which we hope will be found a *distinction* without a *difference* in more than one sense of the words employed. We have dealt thus far with the prospective, let us now turn a retrospective glance at the photographic acquisitions of the year just about to pass away.

At the commencement of the present year we realised the fact of our favourite science having taken such a firm hold on public estimation that its followers would be likely to increase daily in number, and with so many workers in the field it would become more than ever necessary that they should be supplied with accurate and reliable information of all that was going on around them in the photographic *world*. It was our ambition and aim, not only to meet this requirement, but also to offer suggestions relative to promising fields for research; to afford ready and willing assistance, by advice, to those seeking it; to criticise in an independent yet kindly spirit such works as might come under our observation; to comment on the proceedings of the various bodies ostensibly combined for the furtherance and elevation of our art; to notice such literary productions connected with photography as might appear; to draw attention to all unusual phenomena with which we might become acquainted; and generally to be ever on the alert to provide instruction and amusement for our readers. In how far we have been successful in our endeavours to perform these multifarious and sometimes onerous duties, it is for them, not us, to judge. We only know that our labours have been carried on in a sincere and conscientious spirit. If we have been called upon to censure, we have done it with regret; whilst commendation has been accorded probably with more pleasure to us than to its recipient. In the eagerness of controversy we may possibly have given expression to some unguarded word. If any such has inflicted a wound, we sincerely express our regret: we would that photography should be for all engaged in it a bond of amity, and not a source of discord.

When we began this volume we doubled the space which we had until then devoted to a record of the doings amongst our photographic brethren; but so energetic have they been that even this large increase has been frequently found totally inadequate to the purpose, and we have repeatedly had to meet the difficulty by affording more and still more space; and though it entails upon us much additional labour and expense, we hail it as a very encouraging sign of the active vitality of the photographic body.

To our numerous kind friends we have to return our best thanks for their active support in affording many valuable contributions to these pages—the liberality of some professional ones is in this respect deserving of especial recognition. We have many acts of courtesy to acknowledge; and, although it would be unreasonable to expect, holding as we do a somewhat necessarily conspicuous position, that we should entirely escape an occasional misunderstanding, we may consider ourself as unusually fortunate, for with one single exception, to which it is unnecessary more particularly to allude, we are not aware of having excited any malice.

Although during the past year no grand discovery has been made involving anything absolutely new in principle, we may safely affirm that we have made considerable advance in a better understanding of the laws influencing some of the established, well-known phenomena, especially in connexion with positive printing upon paper, and also with the numerous variations of the dry processes for taking negatives upon glass plates. With respect to the latter also we think enough has already been accomplished to afford a reasonable hope that we shall at no very distant day be enabled to prepare plates that shall be as sensitive as any of the most rapid of our wet processes. The elements of success are in existence, as witness what has been done by Mr. Kibble, of Glasgow, though at present we cannot certainly exactly say what has conduced thereto.

In negative processes upon paper a new vein has been struck

by Dr. Maddox, of Southampton, which bids fair to reward experimentalists in that direction.

Ink-printing, carbon-printing, and photo-lithography have each secured a very large share of attention during the past twelve months, while the Hon. H. Fox Talbot has been pursuing his researches with considerable success in photoglyphy. With ink-printing processes we have been disappointed; the results have by no means equalled the expectations in which we had indulged. Photo-lithography is not easily compassed by the majority of photographers, and when a fine impression is fortunately accomplished upon the stone, it requires a more than ordinarily delicate treatment to print off the copies. This is however a field in which much yet remains to be done.

Carbon-printing proper has not apparently advanced a single step since we last noticed it—if we except the productions of M. Joubert, which we had an opportunity of inspecting at the recent meeting of the Photographic Society; but unfortunately the process by which they are effected is still a secret, and likely to remain so. In the specimens which we inspected, those from photographic negatives of natural objects, statuary and landscapes presented a considerable amount of fine half-tone—the weak points here appearing to consist in high lights not quite uncontaminated, and in presenting a slightly grey and flat effect. These failings we regard, however, as much more likely to be overcome than the want of half-tone hitherto so marked in carbon prints.

In connexion with artistic photography proper, we may allude to the reproduction of works of art, which has been carried by Messrs. Thurston Thompson, Bingham, and Caldesi and Montecchi, to a pitch of perfection almost unhoped for; and in another direction the substitution of coloured photographs for ordinary miniatures has been carried to an enormous extent. This last-named proceeding has created a demand for instruction in the peculiar manipulations requisite in following out this operation, and we are happy in having been the medium through which the very best practical information has been supplied: we allude, of course, to the articles of Mr. A. H. Wall, still in course of publication.

There is one feature that we have to remark upon with the highest satisfaction: we allude to the marked and increasing excellence of the artistic element that has in certain quarters been infused into photographic productions. Here until lately was one of the weakest points of photography; but now we are in a fair way to wash out the reproach, and that without any sacrifice of truthfulness or minuteness of detail. Of this fact we have no doubt: the occasions when we have had to notice it have of late been more and more frequent.

Photography, in its application to scientific development, has been materially advanced: as one instance we may refer to Mr. De la Rue's paper upon astronomical photography, read at the recent meeting of the British Association, and recorded in these pages.

In the chemical department the principal novelty has been the introduction by Dr. Schweitzer of a new solvent of cellulose, called by him the oxide of cuprammonium, which it was hoped might advantageously replace the ordinary collodion when saturated with fine cotton or other kind of pure lignine. Hitherto this has not been found to be quite so convenient, though Mr. Heisch, of Blackheath, has shown that it is quite practicable to substitute it for ordinary collodion with equal results, but unfortunately entailing more trouble as at present prepared.

The science of optics as connected with our art has received an unusual degree of attention; but all the great improvements that have been effected were accomplished before the present year. We have however to rejoice in the fact that, the attention of operators having been thoroughly aroused to the importance of procuring as perfect an optical arrangement as possible, a stimulus will have been administered to the various makers of lenses to be more careful in future relative to the perfection of the instruments which they suffer to leave their hands; for when a good lens is not appreciated it is an inducement for the makers of lenses to be careless in their production.

Many improvements and conveniences have been suggested in the construction of various kinds of apparatus employed by the photographer, amongst which we may notice prominently the preservative box for sensitive paper, which appears to be perfectly efficacious.

Several of our friends have communicated accounts of their expeditions in search of the picturesque as food for the camera, and these have generally commanded a considerable amount of pleased attention from their readers, as affording a sort of photographic light reading contrasting well with the solid matter of more regular articles.

Several new Photographic Societies have been established in the provinces, and a fourth in the suburbs of London; thus affording still further evidence of progress in popularity.

We have in every number issued during the year 1859 been able, by aid of our Paris correspondent, to keep our readers *au courant* with photographic progress on the continent; while the occasional communications from correspondents in America, our own colonies, and other parts of the globe, have been sufficient to record anything of interest in the respective quarters whence received.

Notices of the various exhibitions held in this kingdom and also in Paris have, from time to time, appeared in our pages, not in the form of bare catalogues, but critical examinations; and reports of meetings, including not only the papers read at the numerous societies, but also the discussions to which they have given rise, when much valuable information has frequently been elicited.

We have had to deplore the loss of one eminent as holding a place in the first rank amongst opticians, Mr. Andrew Ross—a loss so recent that it must be fresh in the minds of our readers.

We have now briefly enumerated the occurrences of a photographic kind which have befallen us in 1859: we trust that the coming year may be rich in discoveries, and afford a large measure of satisfaction to our friends.

With our next number we shall present with each copy a **PHOTOGRAPHIC SHEET ALMANAC,** containing the days of meeting of all the established Photographic Societies in convenient form for reference by the members of each, together with sundry other useful matter.

In conclusion, we have only to state that no exertions on our part shall be wanting to make THE JOURNAL OF PHOTOGRAPHY even more useful and interesting than it has hitherto been in any phase of its existence; and wishing our readers all a happy Christmas, we pass to the other "orders of the day."

Our French knights of the camera do occasionally astonish us, in spite of our declared intention of not being astonished at anything. At the October meeting of the French Photographic Society the Duc de Luynes presented a considerable number of positive proofs "taken by a process which presents strong assurances of permanence, and which excludes the salts of silver." This gentleman it is who has already distributed a handsome premium to encourage operators to seek for a permanent method of printing, and who has offered a still more munificent prize for the more perfect attainment of the same end. The proofs presented were principally effected by means of the perchlorides of iron and gold; and, when at the close of the communication, Mr. Bingham remarked that these agents had already been employed by Sir John Herschell as the basis of a process named by him the *Chrysotype*, the President replied "that notwithstanding the labours of Sir John Herschell (!) the communication of the Duc de Luynes was *highly interesting*, for his researches had been undertaken with a special and novel (!) object, that of producing proofs as unalterable as possible." (!!!) Is not this a triumphant reply?

The Woodward camera is beginning to excite the maledictions of some of the Paris photographers, who, naturally enough, object to have an arrangement patented which they declare to have been used by them years ago. Amongst the malcontents we notice the names of MM. Chevalier, Jamin, and Bertsch — names not altogether unknown as connected with the optics of photography.

The subject of obtaining *direct transmitted positives* in the camera is engaging the attention of French photographers, and it is one that we regard as of special importance at the present moment, as intimately connected with that of producing *enlarged copies*. The reason is obvious. If we can effect by the camera the formation of a *transmitted* positive under the same conditions as those which now influence the production of a negative, instead of printing on *paper* by aid of the megascopic camera, we should be able to produce upon glass plates as many printing negatives of increased dimensions as may be desired. When done with, these need not be retained, for by keeping always the *original camera impression* we could at any time reproduce the printing negatives with but little trouble, and at the mere cost of chemicals employed. It would not only do away with the compulsory accumulation of large masses of glass, but would enable us to go into the field unencumbered with the heavy clog under which we now have to work.

The most promising scheme that has been suggested for producing these *direct positives* is one brought forward by M. Edmond Becquerel on behalf of M. Poitevin, which consists in an application to collodion of a process invented by our countryman, Professor Grove, for employment upon paper. We regret to notice that not one word seems to have been said relative to the origin of the *principle* employed, Mr. Grove's name not having been mentioned in any way. In a little pamphlet, entitled *Photogenic Manipulation*, by Mr. Robert J. Bingham, published in 1852, at page 68 we find the following:—

> At the second meeting, at York, of the British Association, Professor Grove described a process by which positive pictures could be taken at once, without the trouble of having to take a negative in the first instance. Ordinary calotype paper is darkened till it assumes a deep brown colour, almost amounting to black; it is then re-dipped in the ordinary solution of iodide of potassium, and dried. When required for use it is drawn over dilute nitric acid, one part acid and two-and-a-half parts water. In this state those parts exposed to light are rapidly bleached, while the parts not exposed remain unchanged. It is fixed by washing in water, and subsequently in hyposulphite of soda or bromide of potassium.

To M. Poitevin's application of this principle we see no objection; but we should have been better pleased had we found some recognition of Mr. Grove as the *originator* of it. The process is not only interesting but likely to be highly useful: we therefore give it as follows: —

> To obtain direct proofs by transferring I employ a collodion iodised with potassium salt, but containing less of it than is usually added for a negative collodion. I sensitise as usual, and expose the film for a few seconds to direct light. Its appearance is not changed. I wash plentifully, and dry for future use, or else continue the preparation at once. I cover the moist surface that has been exposed to the light with a solution of twenty grains of iodide of potassium in one ounce of water, the operation being performed in the dark room. When the film has been dried, instead of a solution of the iodide in *water* I use one of the same strength in alcohol. The film may be exposed an hour or two after preparation, if preferable to keep it so long. The exposure required is about three times as long as that for an ordinary negative with the same collodion. After exposure, the film is washed with distilled water to remove the excess of iodide of potassium, and I then plunge it into a weak bath of nitrate of silver, and develope with acidulated pyrogallic acid, *which darkens the parts that have* NOT *received the action of the light.*

We trust that some of our energetic readers will work in this direction.

We have to remind our friends that all works intended for exhibition at the forthcoming seventh annual display under the auspices of the Photographic Society should be addressed to the Secretary of the Society, and delivered, with all expenses paid, at the Gallery, No. 5, Pall Mall East, on the 27th inst. It is in contemplation to open the Gallery to the public, as usual, early in January next. Want of space precludes our giving the regulations in detail; but, as they are identical with those issued last year, the omission is unimportant.

THE PHOTOGRAPHER'S VISION.
A FAIRY TALE.

By One Who is Now "Thoroughly Wide Awake."

With the laudable determination of becoming an out-and-out photographer in the coming season, I lately commenced a study of the required outfit. For several evenings I read of nothing but cameras and lenses, and had just arrived at the conclusion neither to purchase a camera so small as could be carried in the waistcoat pocket, nor so large as to require a two-horse power van, when, tired out by so arduous an investigation, I dropt asleep and presently dreamed, and my dream on this occasion, while very natural (as you will admit) under the circumstances, was also so peculiar that I thought it worth recording.

My first perception in the dream was, that of being transported by rail, some one hundred miles, at a fabulous rate, holding on by a magnetic wire: next, that of being conveyed in a cab to a strange house, and snugly ensconced in an arm chair in a strange room, in which, after rubbing my eyes, I perceived that a number of strange little beings were already located, some lying on chairs, some on tables, and others bolt upright in cases in which they had recently arrived, carefully enveloped in French wadding.

These little creatures or fairies, as they appeared in my dream, were of various forms and sizes, but had one thing in common — they all wore hoops — no whalebone or muslin affairs — but good stout brazen ones. Finding myself unnoticed, I concluded that I must be invisible, and ventured to quietly survey the novel gathering of sprites while listening to their prattle.

Most of these little beings had evidently come a considerable distance, and a general feeling of disappointment pervaded the whole company. Each one, before leaving home, had somehow been given to understand, that whatever good qualities she brought with her the same would be recognised and acknowledged at this the appointed place of rendezvous; but how these fond hopes had been dashed, did not for some time appear.

"I tell you ladies," said one of the smallest of the party, "that we have all — I mean all that are at present in this room — been *bamboozled*. Did we not all come here understanding that we were to be judged by our good qualities and merits generally?" A general cry of "Yes!" "Did any of you receive intimation that your good qualities, no matter how precious, would be passed by unnoticed, except you also possessed some one quality in absolute perfection?" An indignant "No!" from all the fairies. "For my part," continued the little fairy, "I came here quite confident of success; for although I have by no means the *quickness* of some of my more bulky sisters, yet I have equal *sharpness* with the best of them, and I fancy that when properly treated — I mean when I am allowed to look straight forward instead of being obliged to stare upwards, as some of our patrons occasionally insist upon — that I am as free as need be from dis—" Here the fairy instead of finishing the word twisted her little mouth, and all the other fairies nodded their heads in token of comprehension.

Another fairy remarked, though she guessed soon after her arrival how it would be — "When I saw," said she, "the carelessness with which I was examined for all but one quality, and that I was laid aside the moment it was ascertained that I did not possess that quality *in perfection*, I perceived that it was just like throwing pearls before swine to have exposed my perfections to the scrutiny."

The immediate cause of disatisfaction was now in some measure made apparent by an elder fairy, who spoke in rather a majestic tone: "Sisters," said she, "we are all by this time confident that the award of merit is already conferred upon our relative so long closeted in the adjoining room. We are all equally confident that this award is contrary to all decency and propriety, but 'man was ever a deceiver,' and in the present instance he has induced us to leave our comfortable homes under pretences and assurances which he now repudiates. But, my sisters, you are not as well aware as I am of how this has happened. You know that I am gifted with second sight, and I now tell you that a fair trial was intended you, and might have taken place but for a confounded" [I thought this rather an unsuitable word for a fairy to use] "and undue in—" Here a door suddenly opened, and a porter appeared bearing a case, in which was seated *the favourite* fairy of the next room. The

porter having deposited her on the nearest table looked rather timidly at the rest of the company and said — "Ladies, she's got the prize after all." "After all *what* pray?" said an elderly fairy sharply. The porter seemed taken aback and hesitated. The fairy repeated her question with a trebled sharpness. The porter looked despairingly. "Well then, miss," said he, "If you must know, I mean, after all the pains which have been taken in the next room to lessen her imperfections, and she's no better after all." On this the fairies put it to the vote, and carried it unanimously, that the porter was an honest fellow.

Just at this moment the room was darkened by something passing the window on the outside, and a junior fairy exclaimed, "did you ever see such a *pen* as that figure is carrying?" "Its a club," said another. "No," said a third, "its a pen, and nearly all feathers." Instantly there was a clatter of fairy tongues, one half asserting it was a pen, the other that it was a club. When this had subsided, the favourite fairy, who I had perceived to be much elated as the figure had passed, spoke in a contemptuous tone as follows: — "I can set the question at rest, my poor relatives; it is both a pen and a club. The fact is, it was once only a pen, and father a clumsy one too; it had got much the worse for wear, and had, besides, suffered somewhat in my defence, so, in charity, I contrived that it could be used indifferently as a club or a pen. A formidable weapon it now is I assure you, able to crush one of you at a blow, or to prove black to be white, or white black, *by an instantaneous process*.

I thought that some of the fairies turned pale at this speech, but one of the bolder ones asked the favourite whether her present elevation was "due to the pen-end or club-end of the weapon."

What the result of such a ticklish question might have been it is impossible to divine, as a loud ring of the bell startled both the fairies and hurried the porter to the inner room. Seeing that in his hurry he left the door open I ventured to follow, and found myself (in my dream) in company with several gentlemen. It was evidently the remains of a broken-up conference, with the addition of a visitor who had dropped in to gossip.

Perceiving that I was equally invisible in this room as in the outer one, I ventured to take a vacant chair and make my observations at leisure.

One gentleman was still seated at the table, two others were half-turned aside, making the most of the light at their command (this not being over good) while examining some papers. Each of these gentlemen had a small medal attached to a button hole, with the letters M. L. C. in bold relief. The visitor had no such insignia of office. At the further end of the room was a second door apparently leading into a smaller room or closet.

While I was busied in making these observations, the M. L. C. at the table had instructed the porter to have the favourite in readiness when called for. The porter had retired, shutting the door, and the conversation was resumed.

"Well!" said the visitor, who had seated himself opposite the first M. L. C., "what can I say in defence of the M. L. C. for uttering such a verdict." "Now, don't be too hard upon us, my dear sir," replied the other, "we have had, I assure you, great difficulties to contend with. Those little creatures in the next room, fairies as we call them, are so *peppery* that really we feared the consequences of saying too much about them. They might have kicked up a row and scratched each other's faces; what a sad plight that would have been to have sent them home to their friends in."

"Umph," said the visitor, "did not you know of their 'peppery' qualities before you brought them together?"

"To be sure we did."

"Well then, could you have taken a surer way to get up a *fracas* than huddling them together as you have? You must recollect that your brothers in the South were thinking of making just such a gathering, and got so frightened at the probable consequences that they gave it up." "That's all very true," replied the M. L. C., "but we thought that by selecting just one quality, or perfection, and trying the creatures upon that and that only, we might escape the difficulty."

"Umph — escape one difficulty and tumble into a greater, or, as the old saw, 'out of the frying-pan into the fire;' but this reminds me to ask a question: when was that course of procedure adopted?"

No immediate answer followed. After a short pause the visitor said, "*Before or after* you invited the fairies to congregate here?" M. L. C. (after a short pause), "After."

"Well," said the visitor, "I shall not attempt to inquire how far such a course was *considerate;* but may I ask who suggested it — one of you M. L. C.'s or some party exterior to the Committee?"

The one M. L. C. looked at the other two M. L. C.s, and significant glances passed between them; at length the first M. L. C. slowly said, "I am inclined to opine that that must be considered as a Committee secret."

"Oh very well, my dear sir, pray don't tell me anything I should not hear. The object of the formation of the committee I apprehend was to afford better information, respecting the merits and capabilities of the fairies, to those requiring them in practising their black art."

"Certainly," said the M. L. C.

"Then you were essentially a Committee of the practicers of the black art, and as such were expected by them to forward their interests."

"Just so."

"And *not* a Committee appointed by the fairies for blinking the other party."

"Certainly not."

"Then why aid and abet the machinations of even your favourite fairy for blinking your brothers in the black art by stating her perfections only, and keeping out of view her opposite qualities?"

"We did not wish that our brothers should be blinked; but we wished to keep out of scrapes. Now, then, you have the whole secret of the matter."

"You did not choose to get into a scrape with your adopted one, but preferred rather to do so with the host of the rejected. Umph! there must be something very interesting or very peculiar about your favourite. I hope her *symmetry* has not blinded you." [Visitor here looked at his watch.] My time is come, I find, for a call; but I shall return in half-an-hour, and hope then to be favoured with a peep at her *ladyship*." So saying the visitor vanished, and the porter appeared with two letters, which he handed, one to each of the M. L. C.s, who had as yet taken no part in the conversation.

"James," said the first M. L. C. to the porter, "has that door between this room and the closet been properly secured? You know that we desired there should be no further communication through it."

"Yes, sir," replied James, "and a difficult job I had of it. The lock is half spoiled, sir, by some old pens being poked into it. Did you ever, sir — [James here looked a little mysterious] — hear any strange noises coming from that closet?"

"You are superstitious, James, I do believe — get away."

James, on this rebuff, retired, muttering that "since the fairies had come to the house there was no peace for him at least."

I perceived that the other two M. L. C.s had by this time read their respective letters, and now each read his letter aloud — *pro bono committico*. The first ran as follows: —

DEAR SIR,

Understanding that you are an active M. L. C., I hasten to address you on a matter of some importance. From the high opinion which your Committee has favoured the public with in reference to your *favourite*, I instantly set about making one — two of the now antiquated beings yclept "landscapes," precisely similar ones, belonging to a friend, the other my own, and one of my poor spectacle eyes, which happened to be a concave of just the required focus, were sent to a first-rate hand, with all sufficient instructions. The affair — I mean your favourite — was received enveloped in a good smart bill, in which the job was termed special and very troublesome, and looked as handsome as you could wish, and quite symmetric; but, lo! when we tried it, although it gave, as stated, no distorsion, yet in other respects one of the unfortunate old *landscapes* which had gone to its construction would have been far preferable. When you write me, dear sir, as I am sure you will, stating how the L. M. C.s got so good results from their favourite, perhaps you will also inform me how two lenses which have their *foci* coincident, combined with one which has not, can form a combination which *has*. I should have thought this could not be, if I thought at all about it; but in my hurry to get hold of the *acme of perfection*, I thought of nothing but its possession.

Most truly yours, dear sir,

* * * * * * * *

P.S. If the Committee should have made a mistake, I hope they will think it fair only to reimburse me out of their stock-purse the expense I have been uselessly put to in consequence.

The second letter was now read: it began with —

MY DEAR M. L. C.,

I feel it my duty to give you the most timely information of what has just happened to me. Determined not to be behind hand in the possession of one of your favourites, I commissioned a friend in town to procure me one. Well, what do you think he has done? Why, he has sent me what is no more like it than "chalk is like cheese." It has no symmetry at all: not the slightest pretension to it. It is, in fact, the old portrait affair, a little altered and nothing improved, with a diaphragm in front, and includes just one-half the extent of view which I had expected. So I sent it back to my friend, telling him not to be *fooling me*, and to send me the proper thing. You will certainly not believe me when I tell you the result; but, 'pon my honour, he has written back telling me that *I* am "the fool for not knowing that it was all right." Now, is not this too bad?

Your affectionate kinsman,

* * * * * * * *

"A very pretty kettle o' fish I fear we have cooked," said the last reader. Some conversation in an under-tone followed, of which I could catch little except something about making "a clean breast of the matter;" but while straining my ears to catch the conversation, I heard distinctly a *scratching noise* coming from the direction of the closet. This had ceased, and the M. L. C.s were still pondering over the letters, when the porter again entered with another letter.

"More correspondence," said the chief M. L. C., "and not coming from far, for the cement is still wet—short and *apropos*, gentlemen, you will perceive as I read it :"—

Gentlemen M. L. C.s,

Don't be at all "fashed" if people choose to think or say that the symmetric fairy and your favourite are not the same. Leave it to me to convince them, if necessary, and I'll soon do it. It is done in one line—thus: "The symmetric fairy is *mine*; very well. Your favourite is *mine*; also well. "Mine" and "mine" are the same; then so are the rest."

Yours in haste,

A. B—— W.

P.S.—You see from my signature that I am, thanks partly to you, all but Alpha and Omega.

Any comments which might have been made on this note were prevented by the re-appearance of the visitor, escorted by the porter, who, anticipating the call for the favourite, had brought her in her box and deposited her on the table.

The visitor having made his bow took his seat close by, and having surveyed the fairy so far as her present situation in her case permitted, without touching her, said:—"Gentlemen, am I to understand that there is no mistake here."

"It's all right," said the porter, who had not left the room. The fairy was now passed round the table to each M. L. C. in succession, who confirmed the porter's statement.

The visitor now resumed his examination. Lifting the favourite clean out of her case, using both hands, and leaning his elbows on the table, he turned her over and over, attentively examined each end in succession—next unscrewed her, then put her all to rights again, and finally laid her on the table.

There was a short silence—broken by a loud

"Humph, Gentlemen, you have not called this fairy by her right name."

"We differ with you," said an M. L. C.; "we indeed acknowledge a slight alteration in her constitution since she was first described in print, but we are not fastidious, neither should you be."

"Neither shall I be," replied the visitor; "but come, we will appeal to the fairy herself. I know that she will speak the truth." "Come my little dear" (continued he), addressing himself to the fairy, "I shall ask you a few questions, and mind how you answer them. Do you recollect what you were at first?"

Fairy—"Oh, sir, I am so altered that I don't know whether I am myself or not."

Visitor—"Well, never mind that, but tell me what you once were—although you may be quite another now."

Fairy—"Sir, I was symmetry itself."

Visitor—"A fair outside perhaps."

Fairy—"Both outside and inside, I assure you, sir. You might have compared me to an hour glass—my head and my feet perfectly alike—my waist the envy of all my relatives—why sir, my master not only boasted of my fair proportions but declared that on them depended my good qualities. It was wonderful what I could do sir—with my waist tightened until I only measured one quarter of an inch across, I could pirouette over an angle of sixty degrees, but when my waist was reduced to one-half this I could actually cover eighty degrees—a most unheard-of feat I assure you, sir, at that time."

Visitor—"Did you ever try the latter feat?"

Fairy—"I can't recollect, sir, but I'm sure of this that it only remained to reduce my waist *to nothing* and I could have spanned the whole circle."

Visitor—"Indeed! Well, can you now say how you were brought to your present condition?"

Fairy—"Ah! no, sir. They must have given me chloroform, for I was unconscious during the operation. But, alas, I'm no longer the same—my head and feet are now quite different. I have no more symmetry than the most vulgar of my acquaintance. My beautiful waist is gone for ever [here the fairy dropt a tear]. My stays (or stops as they call them) are strangely enough *removed to my head*, and in consequence my view no longer extends beyond that of my sisters. But, what vexes me most of all, sir, is, that by these alterations I actually have lost my character of a *rara avis*, and have become a twin sister of the antiquated lady who has for so many years been taking portraits."

Visitor—"Your case is indeed a hard one, but can you say why you were thus changed."

Fairy—"I suppose I had some imperfections, and I believe I have them still. I was always blamed for being very slow and inclined to *mist*ification. They call it fogging, sir, but I don't think the word genteel."

The Visitor now addressed the M. L. C.s as follows:—"Gentlemen, the fairy has spoken the truth—she is, as she stands, no more a symmetric triplet *than my body*, or than either the portrait or Petzval ladies, both of which I presume you are familiar with—nay she is almost identical with the former. Doubtless, gentlemen, you will immediately publish an accurate description of both the construction and demerits of your favourite, so that your brother practitioners of the black art may be no longer liable to be led astray. Before I retire, gentlemen, allow me to put one more question to your favourite."

Turning to the fairy, the Visitor asked—"Pray my dear, why came you here under a wrong name?"

The fairy looked disconcerted and said—"Oh! sir, I had rather leave that question to be answered by the great pen."

Visitor—"What!—Penn, the famous Quaker! why child he's been dead and buried many years since."

"Oh! no, sir, not him, but a greater pen than him, at least in his own opinion."

"James," said the chief M. L. C., "What is that uproar in the outer room?"

"I declare, sir," said James, "the fairies are all getting into their cases and escaping!"

At this moment, the room appeared to darken. It was no longer day-light—candles burned and burned blue. The door leading into the closet partly opened and a tremendous pen—fully six feet high—at least it appeared so to me—stalked out. I imagined that, in the confusion which ensued, M. L. C.s visitor, the porter, and myself escaped into the outer room, from which by a desperate effort, and incurring sundry knocks on the shins, I escaped into the street. Here I awoke, and found the damage to my shins to be real, having in my dream kicked the poker and tongs about my room and the shovel under the grate!

ON THE FOCUS OF LENSES.

RESEARCHES OF M. CLAUDET.

[Read at the Manchester Photographic Society, December 7, 1859.]

It may appear a somewhat startling assertion to make, that there are comparatively few photographers who know much about the *foci* of the lenses of which they are constantly making use; yet such is unquestionably the fact. I do not mean, of course, to charge them with any incapacity for correctly "focussing," but with a general want of knowledge of the *focal lengths* of the various lenses which come under their notice, and more especially as regards portrait combinations which, as a rule, are reckoned as much shorter than they really are. This may seem a matter of but small importance, and yet there is more dependent upon it than would at first sight appear.

More than usual attention has been directed of late towards the various kinds of photographic lenses now in the market; and an attempt has been made (a somewhat lame one, it is true) by one of the photographic societies of some note to procure a semi-authoritative "report" upon the relative qualities of each sort, by constituting a committee of examination. As I have already remarked upon the shortcomings of the said "report" elsewhere, it is needless for me here to repeat the same; but my object in adverting to it is, to point out that one *essential* element of comparison consists in an accurate knowledge of the length of the *principal focus* of each lens examined, and I shall presently proceed to show how this may be readily ascertained.

Dependent upon this, also, is another matter that has of late attracted much consideration—I mean the enlargement of positive proofs from small negatives, as by a knowledge of the *solar focus* of a lens we are enabled to calculate to a nicety the exact distances between the negative, lens, and sensitive medium, in order to arrive at any required degree of enlargement. For an extremely ready method of making this calculation we are indebted to the researches of a gentleman who has before contributed many useful contrivances for the benefit of his photographic brethren—I mean M. Claudet, who, at the recent meeting of the British Association for the Advancement of Science at Aberdeen, read a paper on the subject; but in consequence of its having been written in the French language, and not yet published, I have been unable hitherto to procure particulars. A very short statement of the principal point of the communication was, however, inserted recently in a French periodical publication, edited by the Abbé Moigno (who himself was present at the meeting), and which has been quite sufficient to enable me to examine the question and verify the fact stated; at the same time, I have been so impressed with the great convenience of the method

that has been discovered by M. Claudet, of calculating the respective distances of the conjugate foci for any given lens together with certain other points of utility that have occurred to me during the examination, that I have determined to make a communication on the subject, as it is very uncertain how long it may be before photographers are in possession of M. Claudet's own paper. I would premise, however, that although M. Claudet may justly claim what merit there may be in this paper, he is not responsible for any misstatements or errors that it may contain.

So far as I have been able to ascertain it, the special point of M. Claudet's recent communication has been the discovery of the fact — "*That if the principal or solar focus of a lens be regarded as the unit of measure, an object situated in front of the lens at a distance from a certain point, equivalent to any* MULTIPLE *of the said unit, will have its conjugate posterior focus at a distance from another certain point equal to a corresponding* FRACTION *of the same unit.*"

This will, perhaps, be more readily understood if I put the proposition in a popular form, as follows: — Suppose we have a lens of *twelve inches* solar focus, — an object situated at *six feet* distance from a certain point in front of the lens, that is at six times the unit of measure, — the conjugate posterior focus will be at a distance of *one-sixth part* of the same unit — that is, at *two inches* distant from a corresponding point behind the lens.

So far as I am aware, this simple relation between the conjugate foci of lenses has been first observed by M. Claudet; for though we certainly have been able to calculate the respective distances from the lens of the conjugate foci, in any given case, it has been by a much more complicated method. Sir David Brewster gives the following rule, viz. — "Multiply twice the product of the radii of the two surfaces of the lens by the distance of the radiant point from the centre of the lens, for a dividend. Multiply the sum of the two radii by the same distance, and from this product subtract twice the product of the radii for a divisor. Divide the above dividend by the divisor, and the quotient will be the focal distance required." Now, besides the number of figures involved, this rule is of no use as regards a compound lens, the parts of which are separated as in a photographic portrait combination.

The proposition stated above (which is in italic) is all that the very meagre account given of M. Claudet's paper enabled me to gather, with the exception that the *certain points* named are situated the one before and the other behind the lens. The exact points I set about ascertaining, and, in order to do so, made the following reflections: —

In order to avoid the risk of misapprehension as much as possible I may, first of all, remark that all photographers are aware that the nearer an object is situated, with respect to a lens, the further from it, on the other side, must the ground glass screen be placed, and *vice versâ*. The object and the glass screen are, in either case, situated respectively in the *conjugate foci* of the lens.

To ascertain the limits within which the *back focus* of a lens is confined, we have only to remember that it must be between the points of the solar focus (that is, the focus for parallel rays) and the point at which the image is equal in size to the object. Now, it is well known that when the image is of the same size as the object itself, the two must be equidistant from the *optical centre* of the lens, and *each* twice the length of the principal focus from the same centre. It is therefore clear that, if in all cases where the object in front is at a distance that is any *multiple* of the solar focus, the posterior focus must be a *fraction* of the same, M. Claudet's *certain point* behind the lens must be that point located at the solar focus from the optical centre; and, further, that M. Claudet's *certain point* in front of the combination must also be a point at a distance equal to the solar focus from the optical centre; because when the image and object are equal in size, by M. Claudet's formula —

$$\text{The focus} + 1 = \frac{\text{The focus}}{1}$$

when measured from his *certain point*. The next thing to find was the *optical centre* of a portrait or other combination, and its solar focus. The former I ascertained in the following manner, as being simple and easily performed, though there are other modes of effecting the same object: —

TO ASCERTAIN THE OPTICAL CENTRE OF A PORTRAIT COMBINATION.

Arrange your lens as if about to take a portrait, and place on a screen any convenient object — a sheet of printed paper answers very well — then focus so as to have the sharpest possible definition upon the ground-glass. Measure the distance between the ground-glass and the *back* combination very accurately.

Be very careful to keep the object and ground glass screen *fixed* until after the next operation.

Now *reverse the lens*, and with the object and focussing screen still at the same distance apart, again focus carefully, and measure accurately as before the distance between the ground glass screen and the *same* part of the lens, which, in its last position, will be at a greater distance than formerly. Deduct the smaller length from the greater and *halve the difference*. The result measured from the back lens towards the anterior part will show the *optical centre*, and this point should be marked on the tube of the lens.

To verify the result obtained, proceed as before, measuring the various distances from the *front* part of the combination, halving the differences as before and setting off this distance from the front towards the back of the lens.

It is at the point ascertained as above where the diaphragms ought to be placed.

In a portrait combination the *optical centre* will be found to lie at a point between the components; in the best constructed ones, rather nearer to the front than the back.

In the orthographic form of lens, some point within the convex lens of the combination will be the *optical centre*.

TO ASCERTAIN THE PRINCIPAL FOCUS OF A PORTRAIT COMBINATION.

The principal or solar focus of a lens or combination of lenses is the focus for parallel rays measured from the optical centre. One of the simplest means of finding it is to focus upon any suitable screen a sharp image of the sun, and having previously ascertained the optical centre, measure the distance of the sharply defined solar image from this centre, as indicated on the tube. It is a good plan to mark this distance on the lens tube beside the line indicating the centre.

But if the sun be not available, proceed as follows: —

Select as distant an object as you can readily find, and having focused it carefully, you will know that the distance between the ground-glass and the "centre" mark on your lens will be a *trifle longer* than the solar focus. Now put up any regularly divided object (a sheet of ruled paper, or a foot rule for instance) at *double* the ascertained focal distance from your lens' "centre," and focus carefully. If the operation has been correctly performed you will find the image a trifle *smaller* than the object.

Move the object a shade nearer to the lens and again focus and measure accurately the size of the image, and continue thus until your image and object exactly correspond in dimensions; you have then nothing to do but to halve the focus so found to know the solar focus, of course always measuring from the *optical centre* of the lens.

As regards the application of the preceding, when comparing lenses one with another, a knowledge of the respective foci is indispensable, in order to allow of the observed results being of any value. Again by a knowledge of the very simple law of the relation of the conjugate foci, it is very possible to compare lenses of *different foci* one with another, making the requisite allowances before performing the manipulations of comparison, and yet obtain reliable results.

And thirdly, when using lenses to enlarge a negative, we may at once place the negative, lens, and sensitive surface, correctly in place, without any necessity for ascertaining by inspection whether they are in proper focus; a matter not only of great convenience, but absolutely admitting of greater accuracy than is readily attained by the ordinary method of focussing, when the lens and the image are necessarily at a considerable distance from each other.

I must crave the indulgence of my audience for the somewhat technical nature of this communication, trusting that the knowledge of the simple law of relation between the conjugate foci of a lens, as discovered by M. Claudet, may be found of sufficient interest and utility to excuse me for trespassing upon your attention.

GEORGE SHADBOLT.

2, *Upper Hornsey Rise*, 29*th Nov.*, 1859.

THE POSITIVE COLLODION PROCESS, WITH SOME REMARKS ON THE ALABASTRINE PROCESS.

By G. WHARTON SIMPSON.

[Read at the North London Photographic Association, November 30, 1859.]

IT is a somewhat singular fact, that whilst the positive collodion process is regarded as the simplest and most easily managed of all photographic processes, there are found amongst exhibited collodion

positives a greater number of thoroughly bad pictures — productions at once a disgrace to photography and a burlesque upon art — than are produced by any other process. Perhaps, indeed, the very simplicity of the process, the ease with which *something* having a relation, however remote, to pictorial art, may be produced, is really the cause of this prolific spread of such photographic enormities. Certain it is that there are no mysteries in the process, no difficulties in the manipulation, to hinder persons of average capacity and ordinary care and perseverance from producing, under anything like fair circumstances, excellent photographic, if not always artistic, results.

In the details I am about to give of my own practice, I shall, at the risk of producing something very like an elementary treatise on the subject, begin at the beginning, and very briefly describe the manipulations in their natural order.

SELECTING AND CLEANING THE GLASSES.

The glass I prefer for the purpose is the best flatted crown, picked free from blemishes and scratches. The smoothest side should, of course, be chosen for the picture; and if, as is sometimes the case in large plates, there be a slight curvature, I coat the plate on the concave side. In regard to methods of cleansing, it is possible to obtain a perfectly clean plate — the thing imperatively required — by almost any of the plans recommended by various operators. The most certain and speedy method I know is by the use of a preparation sold for the purpose under the name of the "Photographer's Detergent." This is a liquid about the thickness of cream, which is applied to the plate with a piece of woollen rag, and which begins to dry almost immediately it is applied. It is removed by rubbing the plate with a clean linen cloth, all dirt and grease disappearing at the same time. A solution of somewhat similar character, perhaps not quite so good, is made as follows :—

Water	1 ounce.
Alcohol	1 „
Nitric acid	1 drachm.
Fine Tripoli *quantum suff.*	

The solution should be of the consistency of thick cream. A good method of applying it is with a rubber, made of a strip of list or woollen cloth, a foot or two long and three inches broad, rolled up tightly and tied with string. The advantage of this method of cleaning, either using the preparation just described or the "Photographer's Detergent," is that no water is required, and thus a considerable amount of time and trouble are saved; whilst the use of an alkali, always dangerous and of doubtful efficacy, is avoided. The cloths I prefer for the purpose are those of a strong coarse linen, known amongst housekeepers as glass cloths. Partially-worn diaper, which has been often recommended on account of its softness, is objectionable, as causing a large amount of "flue," the particles of which cling about the glasses. The cloths should be frequently washed in boiling water without the use of soap. The wash-leather for giving the final polish I generally treat when new in the way I formerly practised for cleansing the buckskin used for covering the buffs for polishing Daguerreotype plates; namely, after beating them well, I wash them well in a mixture of equal parts of spirits of wine and water. In using the leather, I adopt the precaution of keeping one side — the rough side — always to come next the hand; and the other — the smooth side — always next the glass. By this means any chance of perspiration from the hand coming in contact with the glass is avoided. In some states of the atmosphere, and with some qualities of glass, every possible precaution is required to get a clean plate. If the plate cannot be got to appear satisfactorily clean, on breathing on it, it is best to throw it aside; as a good positive cannot be produced on an imperfectly cleaned plate.

THE COLLODION.

A variety of collodions essentially differing in characteristics have been prepared for the positive process by manufacturers, and a variety of opinions have been expressed as to the requisite qualities of a positive collodion — many recommending a thin lightly iodised collodion, and a weak nitrate bath, others enforcing the importance of a highly iodised collodion of good body, and a strong nitrate bath; some recommending the use of bromides and chlorides, and some preferring the simple iodide. Perhaps the diversity of opinion arises to some extent from different ideas being held as to what constitutes a good positive. Some authorities, of high repute, speak of the necessity of a very thin white deposit of silver, pure in colour, but without intensity. My own experience is decidedly opposed to this idea: such pictures, especially if backed with black varnish, generally appear comparatively poor and flat, deficient in vigour and perfectness of modelling. A collodion giving a rich creamy film in the nitrate bath, yielding on development a fair amount of intensity combined with pure colour, gives by far the boldest and most vigorous picture.

I have tried several methods of making soluble cotton for a positive collodion. The last formula given by Mr. Hardwich, in which a large excess of sulphuric acid is used, for the ostensible purpose of parchmentising the cotton prior to its conversion into pyroxyline, I have found to give an excellent cotton when it gives any at all; but on comparing my own experience with that of several friends who have tried the same formula, I find that a large per centage of failures has been the result. This has arisen, doubtless, from some slight unobserved or unknown error in proportions or manipulations; but the great danger exists, of which Mr. Hardwich himself speaks, of the whole of the cotton being entirely dissolved by the acids. The formula I have found to give uniform success both in my own hands and that of others is one, an approximation to which is, I believe, commonly used, but which I find given definitely by Mr. Sutton, and is as follows: — Of sulphuric acid s.g. 1.840 — the oil of vitriol of commerce is, I believe, sufficiently near the mark — and of nitric acid s.g. 1.420, equal parts by measure. To three measured ounces of the mixed acids, one drachm of cotton wool will be about the right quantity. The time of immersion not less than five minutes; the temperature being maintained at about 150°. I have found that the nitric acid most commonly sold, commercially, as pure nitric acid, has generally a s.g. of 1.360; and in this case I have found that six measured parts of sulphuric acid to four of nitric acid of this strength give an excellent soluble cotton. In either case the cotton gains fully fifty per cent. in weight, and yields an even sensitive film, adhering well to the glass and quite transparent in the shadows.

Six grains of either of these cottons will dissolve perfectly, with scarcely a perceptible residue, in equal parts of washed ether s.g. 750 and alcohol s.g. 820. More cotton would dissolve, but this is sufficient. Alcohol and ether of these strengths are easily procurable; and I have found after long use that the alcohol may be used, safely and with advantage, in at least equal proportions with the ether.

I may here state an interesting experiment I recently made with reference to the principle of alcoholic collodion, as proposed by Mr. Sutton, of Jersey. In order carefully to test the principle, we prepared in Mr. Sutton's laboratory, three samples of collodion. The first sample contained four parts of absolute alcohol to one of absolute ether, and constituted what Mr. Sutton has called alcoholic collodion. The second contained equal parts of the same solvents. The third sample contained seven parts of the ether to one of the alcohol. The s.g. of the ether was 723, that of the alcohol 799, and both were methylated. Each sample contained eight grains of cotton to the ounce, which dissolved perfectly. Each was iodised with iodide of potassium, fourteen grains of which were dissolved in one ounce of alcohol s.g. 820, of which solution one part was added to three of plain collodion. On adding the iodiser, in each case entirely different results were produced as to colour: the alcholic collodion took a pale straw or lemon colour, which it has preserved to this day — between two and three months — without getting deeper. The second, or half and half, rapidly took a pale sherry colour; and the third, or ethereal, became red within an hour. I may add, to explain the rapidity of these changes, that the cotton was slightly acid from hasty and imperfect washing. I brought these three samples to London, and tried them carefully against each other about a fortnight after they were made. The results were interesting and instructive. The first, or alcoholic, which flowed over the plate like oil, without the slightest trace of structure, required ten seconds exposure in a somewhat dull light to obtain a good picture; the second required fifteen seconds to produce similar results; and the third twenty-five seconds. In each case good fine toned positives were obtained. In this case the effect of alcohol in increasing the sensitiveness of the collodion was strikingly illustrated, whilst the respective changes of colour were very significant as to the chances of stability in each sample.

A continuation of this experiment was interesting and confirmatory of all my experience as to the effect of bromides. I divided each of these samples, and to half of each added a bromide in the proportion of from half a grain to a grain to each ounce, the first result of which was a slight milkiness and subsequent precipitation of, I presume, bromide of potassium. On subsidence I tried each bromidised half against that simply iodised. The alcoholic sample, requiring when simply iodised ten seconds exposure, required only three seconds with the addition of a bromide. A similar or still more marked increase of sensitiveness occurred in the other samples. The silver bath was an old one, to which no addition of nitric acid had ever been made. The developer proto-sulphate of iron

acidified with acetic acid. These facts seem to controvert the idea frequently expressed, that bromine is an accelerator only in the strict absence of organic matter, and where nitric acid is used in the bath and developer.

To return to my own practice in the positive process. The collodion I generally use, stands thus:—

Washed ether, pure or methylated s.g. from 720 to 750	1	ounce.
Alcohol s.g. 820	1	„
Iodide of cadmium	3	grains.
„ ammonium	5	„
Bromide „	1	„
Soluble cotton	10 or 12	„

I use these proportions with spirit of the strength named, which is generally easily procurable. Where absolute alcohol can be procured a much larger proportion of alcohol can, as I have already said, be used with advantage.

This collodion gives a creamy film in the bath, and under ordinary circumstances yields a picture possessing vigorous lights, with delicate half-tones graduating into rich transparent shadows.

I find, however, as I think every photographer has found, that no formula will work equally well under all circumstances, that apparent changes in the chemicals frequently occur without the intervention of any preventible cause. The nitrate bath especially appears to be subject to these vagrant fancies, and after giving a certain class of pictures one day, refuses, under apparently precisely the same treatment, to yield the same results in a few hours or days afterwards. As after once making a nitrate bath in proper condition I do not like to tamper with it, I generally find the simplest way out of the difficulty is the use of another sample of collodion. With this view I generally have in working condition several bottles of collodion, each possessing different characteristics. A valuable means of producing these modifications in the collodion exists not only in varying the base and amount of the iodiser, but especially in varying the amount of bromine. The action of bromine in positive collodion is not simply in accelerating or increasing the sensitiveness, but also in decreasing over-intensity and producing half-tone and softness. By keeping samples of collodion, some of which contain a large amount of a bromide, and produce corresponding excess of half-tone, and others with a small amount of bromide, and great intensity and contrast between lights and shadows, I find I am generally able to meet the changing circumstances caused by varying light, temperature, and condition of the nitrate bath. If the circumstances be conducive to the production of a feeble picture with excess of half-tone, I find that by using a collodion iodised with potassium and a small portion of bromide I can generally obtain at once sufficient intensity. On the other hand, if excessive intensity be the fault, I find that by using a collodion sensitised with ammonium or ammonium and cadmium and a full portion of bromide that softness and half-tone are obtained.

It is necessary to observe, however, that I have generally found a tendency in bromides to injure slightly the tone and brilliancy of the picture. Another effect of the addition of bromides, which I have invariably found, and have never seen any reference to, is its influence in producing a clean picture. Samples of collodion which have yielded dull, spotty, streaky-looking pictures when simply iodised, have given results clean and perfect on the addition of half-a-grain or a grain to the ounce of bromide. I find also that collodions which, simply iodised, have become seriously deteriorated in a couple of months, have with the addition of a bromide remained in perfect condition or have even improved at the end of six months.

I have tried some experiments with the addition of a chloride to collodion for positives, but without sufficiently satisfactory results. I have been inclined to think that the tone of the picture was improved by the addition, but have not repeated the trials sufficiently to speak with certainty.

Sometimes with a collodion quite new I find the blacks improved by the addition of a few drops of tincture of iodine. Still better than this for the purpose I have found the addition of about a drop to the ounce of hydrobromic acid, which rapidly produces on the collodion the effect of maturity.

(To be continued.)

PHOTOGRAPHIC PRINTING.

By A. J. Melhuish.

[Read at the Blackheath Photographic Society, 19th November, 1859.]

There are, I think, few things which appear more easy at first and more difficult as our experience increases than photographic printing. I well remember my first picture: it coloured rapidly a rich purple brown, not a tinge of yellow in the sky, and I thought that, although the negative process was rather troublesome, positive printing was easy and certain: little did I then conceive how much I had to learn ere I could produce the same results at will. I have now, after much experience in this branch of photography, become acquainted, I trust, with every difficulty connected with it, and I am anxious this evening to impart, as briefly as possible, to those of us who are not yet initiated in these mysteries all that is really necessary to practice this branch of photography with certainty and success. I may here mention that I shall confine myself, this evening, to a purely practical view of the subject; not that I undervalue the efforts of the chemist and the philosopher—indeed nearly all our hopes rest on them—but that I think it well to leave this for the performance of abler hands.

It will assist us in forming a clear view of our subject if we consider, separately, each object we wish to attain in photographic printing, and the means best calculated to secure it.

1. Having prepared a *good* negative, our first care should be so to protect it by varnish that a large number of copies may be printed from it without injuring the film. There is perhaps no better article at present made than that known as the French varnish. It requires the plate to be warmed when applied, and left about a day to get thoroughly hard.

2. As, unfortunately, our negatives are seldom perfect, our next object is by the process of doctoring, to hide as much as possible whatever defects there may be; this, I am aware, many object to, but as I am at a loss to see any foundation for such objection, I shall not stay to consider it. When a negative has been sufficiently exposed (a thing, by the bye, of most uncommon occurrence), the sky is generally so weakened by excess of light that it requires filling in, or as some term it, stopping out: the best thing for this purpose is a mixture of lamp-black, of neutral tint. I use Reeves' moist water-colour tubes, with a little gall. It is sometimes required to shade some portion of the picture which prints too dark, such as, for instance, the face of a portrait: this should be done by applying on the plain side of the glass a little lamp-black, and when nearly dry, softening it with the finger or a piece of rag; many a negative, otherwise lame and poor, may be made to produce brilliant prints by judicious application of this method of treatment. Having done all the shading required, varnish again with amber varnish; if shaded on the back, it is well to varnish that also. Should the sky ever become sticky, sprinkle it with whiting.

3. Our object now is to obtain a sheet of sensitive paper which will give as good a proof as possible. This I find (provided the positive paper is good) depends much on the amount of silver deposited on the surface of the paper; I therefore float the paper on a seventy-five-grain solution of nitrate of silver for about two minutes; hang up by one corner, when nearly dry, float again for the same time, and hang up by the opposite corner. I may mention that a strong negative requires to be printed in a strong light, and *vice versâ*.

4. Having obtained a print of sufficient intensity, our next operation is to tone and fix it, and upon this part of the process the beauty and permanency of the print mainly depends; up to this point all is easy and certain, but now phenomena of the most peculiar and diverse character appear. Now is the time to produce that "abominable yellow" which so deeply affected Mr. Sutton. Now spots scarcely visible become first stars, then comets, with long flowing tails. Now we may obtain that green—that *strange* green—which is too well known to need description, and which, for want of a better name, I would call *the old hypo' green*. Now delicate copies of the cuticle may be seen delineated upon the sky, and now may be witnessed that interesting phenomenon of brown spots, growing out of nothing—indeed there is scarcely any limit to the spots and stains and sickly hues which it is our privilege occasionally to witness at this stage of the process; but on the other hand, now may be produced a picture so chaste, so exquisite, so truly beautiful, that I know nothing that will bear a comparison with it: there is a transparent bloom upon a fine albumen print that is seen nowhere else. The following are the two methods I now adopt and strictly adhere to—the first, when a purple or reddish-brown is required; the second, when a violet tint is preferred:—First, wash the print in common water; fix in *new* hypo', four ounces to the pint; then tone in a new bath of—gold one grain; nitrate of silver two grains; hypo' half-an-ounce; distilled water one ounce. First dissolve the hypo', then add the gold, and last the silver. Warm the solution in cold weather.

Second, wash the print with *particular* care; tone in—gold one grain; carbonate of soda one grain; distilled water one ounce;

in a few minutes the print is toned, and then fix in — water one pint; hypo' two ounces: leave it in this bath about five minutes.

5. Having obtained a perfect print, our only object now is to keep it so; consequently we stop the action by carefully washing out every trace of chemical which does not form a portion of the picture. A print should not be washed less than twelve or more than twenty-four hours; the water should be changed constantly, and the print wiped often on both sides with a sponge. Respecting the failures, the small spots may generally be avoided by keeping the paper quite dry, and, if possible, warm until it is toned; the "abominable yellow," by washing the prints before toning them, and the detestable green, by using the gold and hypo' bath *new*.

Having had occasion several times to use the word *negative*, as applied to photography, allow me to protest against this absurd misnomer. Many an one who has no practical knowledge of photography might understand us if we told him that we printed our picture from a *reversative*, whereas, it is impossible to convey the faintest idea of what we mean to such an one by the astounding assertion that we produce our positives from negatives. When whilst washing our picture we see the film slip quietly off the plate into the sink, then indeed may we boast a negative; but let us no longer call that a negative which produces such positive results.

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

Views in China.

NEGRETTI & ZAMBRA, Hatton Garden, and Cornhill, London.

[SECOND NOTICE.]

HAVING disposed of the principal figure subjects in the series before us, we turn to the other classes.

Next in interest to the inhabitants we regard their idols and the temples; hence we come to

THE JOSS (No. 25), which represents the Goddess of Fecundity. The idol was presented to the temple by one of the Chinese Emperors, and is held in the greatest veneration, especially by the female inhabitants of Canton. Behind the principal idol are located several smaller ones, and on the ground before it are placed plants in vases as votive offerings; but their dried up and withered appearance does not say much for the attention they have received.

THE JOSS HOUSE (Nos. 23, 24, and 27), are different views of the building, which received considerable damage during the bombardment, not so much from the fire of our troops as from the act of one of the Braves, who threw a bag of gunpowder into the building under the impression that it was occupied by some of the barbarians. The explosion demolished a considerable portion of the edifice. It is richly decorated with carving and other embellishments, partaking largely, however, of the grotesque. This is best seen in No. 24, which is a front view of the principal entrance.

THE TEMPLE OF THE GENII (No. 8), is peculiarly Chinese in aspect, and the slide will certainly be a popular one. The building is situated in the Tartar quarter of the city, and it is to be regretted that it has suffered materially during the bombardment of Canton, the inhabitants of which hold this temple in great veneration. The quaint character of the structure and the agreeable contrast of light and shade render this subject extremely pleasing. A general distant view of this temple is found in No. 12, in which it forms the principal feature, and is there seen to be surrounded by a clump of tall trees. We are informed by the description that the building contains the largest bell in Canton, which is regarded with superstitious awe as foreboding evil to the place whenever it is sounded. During the bombardment a shot struck the bell and cracked it, and the sound emitted was interpreted as the knell of the city's prosperity. From the upper part of the last named, the panorama which forms the subject of No. 10 was taken. The view extends over an extensive range; and although the houses, for the most part, present a very mean appearance from being interspersed with some large sized trees, and here and there a structure of a higher character, together with the distant wooded country, the whole composes into a sufficiently pleasing subject. In the centre is THE MUSSULMAN PAGODA, said to be built by a son or brother of Mahomed, who first introduced Islamism into Canton. The structure itself is one of very little interest, being merely a tall circular shaft without window or any visible opening of any kind, and crowned with a smaller shaft, also circular, presenting much the appearance of a lighthouse.

THE NINE-STORIED PAGODA (No. 29), on the contrary, is peculiarly interesting and thoroughly Chinese in its architectural character. It is octagonal in form, and each storey being somewhat smaller than the one beneath it causes it to taper upwards. Although originally richly gilt and painted, as well as ornamented with elaborate carved work, it is now in a painful state of dilapidation, so much so that it would be impossible to ascend the spiral staircase which leads to the top. Much to the consternation of the population, an iron model of the pagoda, which until lately surmounted it, fell down; the feeling will be understood when it is known that a superstitious tradition was in existence that, whenever the model should fall, the city itself would fall into the hands of the barbarians.

THE SMALL PAGODA (No. 28).—On the south-east side of the city is an edifice of a different aspect, being only of three storeys in height, octagonal in outline, and picturesquely situated on an eminence beyond the walls of the city, a portion of which is apparent in the foreground of the picture. The pagoda itself is now in the occupation of a detachment of British troops, and in the distance is seen a range of mountains, known as the White Clouds Mountains.

THE FIVE-STORIED PAGODA (No. 5), now occupied as a barrack for the allied troops, is situated on the extreme northern point of the city walls, and in this direction the general level of the country seems to be interrupted by a series of very respectable hills. The residences located on the city walls appear to be very characteristic of the place, and the slide is an extremely pleasing one. The pagoda itself is not at all imposing, and reminds one of the grand-stands at some of our race-courses.

We must, for want of space, pause for the present, but purpose in a future number returning to the subject, as there are many more of the series that deserve particular notice. In the meantime we cannot do amiss in advising those of our friends who are in search of some acceptable article as a Christmas or New Year's present for a friend, to procure this truly valuable collection.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the above Society was held on Tuesday, the 7th instant, HENRY WHITE, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

Several gentlemen were duly elected members of the Society.

The lists of retiring officers and proposals for re-election were then read, and are now affixed to the walls of the meeting-room.

MR. ENNEL said that the few things he proposed to have the pleasure of communicating to the Society were, to the best of his knowledge, new to photography, and, of course (as he thought), improvements. He proposed to follow the usual order of photographic operations, and state his remarks just as they occurred to him: he might now and then digress, but there would always be certain landmarks sufficiently salient by which he could find his way back again. He would begin with the first, and which is a most important operation — that of cleaning the plates, for which a special preparation has been advertised. We have powders and liquids on the one hand, and simple washing on the other, and they are all very good in their way. We may very frequently adhere strictly to a rule and yet violate the principles upon which that rule is based. There are many principles involved in cleaning plates; he would mention there was hardly a substance which does not adhere to glass, indeed, he knew of no substance that did not adhere, and the attraction by heat was more or less increased with different substances. The question was how to get those foreign substances away from the plate: with simple washing he could not manage it, the friction between the fluid-water and the plate is so very small that it does not overcome the attraction of adhesion; it was like the old trick which puzzled children so much — that of putting a shilling in the palm of the hand and attempting to brush it off with a stiff cloth brush, the friction not being sufficient to overcome the adhesion between the shilling and the palm of the hand. There were a great many instances in which the water did not wash away the adhering substances; for instance, the developing glass could not be washed out clean by water or acid without friction — acids give a deposit, and a bottle-brush or its equivalent must be resorted to. A feather by its centrifugal force will clean it. Washing a plate under a tap did certainly not appear to him to be the right way, because the drippings on the glass will afterwards adhere to it; it is much better to immerse it in water sideways, so that all the deposits shall sink down to the bottom: however, washing gave trouble, and, after many experiments, he found nothing better than the old tripoli rubbed on with a roll of flannel and immediately rubbed dry with linen, and that operation was very simple indeed when the cleaning board was used. There were many cleaning boards in use, but one he exhibited to the meeting he considered an improvement.

MR. ENNEL then referred to the coating of plates, upon which a great deal had been said. For small plates he did not consider it signified much whether you coated the plate by pouring on in the centre or at the side. For large plates he preferred coating from one side, just in the same way as he poured on the developer, and that avoided the double layer of film in parts of the plate so frequent in summer, especially in stereoscopic slides. He exhibited a collodion bottle by Hughes, and another by Brown, of Farringdon Street, which did not allow the film to

set in the neck, the vapour of the ether keeping it in solution: he secured his collodion bottles by a fillet or strap of india-rubber, which prevented the ether blowing out the stopper. He then proceeded to the dipping, and urged as a reason for preferring the "poor" glass dipper over the silver wire dipper, that though the glass broke it did not bend as did the wire, and the glass was the cleanest of the two. It had been urged that the wire did not adhere to the plate as did the glass dipper; but he contended that the adhesion was an advantage, and by sliding the plate off over the bath, one wiped the plate against the edge of the dipper, and saved an immense deal of silver. He was constantly in the habit of adopting that course. After immersing a plate he never touched it with his fingers, but took it out with what is called an American clip; then scraped it upon the dipper; then put it upon blotting paper for a while; then inserted a piece of blotting paper between the lower edge of the frame and the plate, so that the blotting paper touched the front of the frame; he then bent the paper over to get rid of the clip, and the plate is ready to slide into the camera. He had the camera at the meeting, because it had been the subject of discussion some time ago. After exposure in the camera he did just the same with the back, so as not to touch the film, and by using the clip while developing he had no pyrogallic acid or silver upon his fingers, which was an advantage, although some persons thought it right to carry about in the world the photographic sign upon their finger ends. He (Mr. Ennel) then exibited his universal levelling stand. Supposing the negative to be varnished, or not, according to the circumstances, although he might say that there was one negative which must be varnished, and that was when it was strengthened by bichloride of mercury; without its being varnished the mercury will find its way to the silver in the paper when brought in contact, and fill it with spots. In printing he understood that many negatives were broken in the ordinary pressure frame; he never had any broken because he never used the printing frame. He employed instead a mahogany board, with a cloth over it, and with a series of clips, which he produced, in which the fulcrum was so situated as to allow of their being put standing up or laid down. Mr. Hannah, of Brighton, he asserted, does the same, except that he uses plate glass. His presses were safe, cheap, portable; did not take up much room, and were very convenient for vignetting. Another operation which calls for the application of the clip is the sensitising the paper, when, instead of taking it out with the fingers, it is best to take it by the corner with a clip, place it upon an overhanging shelf, and then there is no more trouble with it, except to put one end of a small thin slip of bibulous paper about one inch long, and very narrow indeed, just in contact with the lower corner of the paper to draw off the lingering surplus silver bath. When the prints are obtained and washed they are hung up to dry in the same manner.

Upon referring to the washing dish, he observed a principle that he imagined had not before been remarked upon. Mr. E. then produced a large, flat, circular, yellow earthen dish, with a hole drilled through its side, into which, by means of gutta-percha, was cemented a glass syphon. Above the dish, from a tank, hung another syphon, with a regulating clip holding the india-rubber orifice, which is convenient when working in a dark room, as the supply can be regulated, the water kept constantly in motion and ever changing. The water thus run off requires to be precipitated. It is convenient to filter the bath by means of a regulating clipped syphon discharging itself into a funnel, inasmuch as once set to work it goes on, requiring no attention, and producing no stains and avoiding all spilling.

In testing the bath, Mr. E. had simply a narrow glass tube drawn out to a point, with an elastic ball at the other end, by which means he drew up into the tube twenty or thirty drops, as might be necessary, of a strong solution of salt, say thirty-two grains to the ounce, so that five grains of which will precipitate one grain of silver. Upon pressing the ball at the top, the solution will be *forced* out at pleasure, drop by drop, as long as precipitation takes place, giving the strength of the bath. It was not a very nice mode of testing, and would not do for assaying; but served the purposes of photography, and was an expeditious process.

Upon the subject of the dissolving of salts, it was a well-known fact, and daily practised among chemists, as is seen in the trough of the electrotype bath, to suspend the salt, because the fluid around it becoming saturated also becomes specifically heavier; and in the case of salt at the bottom, the heavier saturated fluid will surround the salt, and take up no more unless you disturb it; but by suspension, as fast as the fluid around the salt becomes saturated, and consequently of greater specific gravity, it will fall to the bottom, being replaced by a fresh supply of fluid around the salt, and so on until the whole of the fluid becomes saturated. It was the practice with salt to shovel it into baskets, and to lower them with ropes to the surface of the water, when the same process went on. With gum-arabic it was very convenient to tie it in a muslin bag, and suspend it, as it then became more quickly dissolved, filtered itself, and avoided the breaking of glass rods in the awkward stirring from the bottom. Professor Taylor had suggested to Mr. E. to try the effect of suspension of nitrate of copper, with some nitrate of copper at the bottom of the vessel; and this experiment Mr. E. exhibited with a glass test-pipe, showing the blue stream falling. What made the experiment interesting to photographers was, that it clearly exhibited the process that was going on in the dissolving of pyroxyline, which is a process of perhaps three or four weeks, whereas, if the pyroxyline be dissolved by suspension, it may be iodised the next day. Mr. E. exhibited the process of solution of pyroxyline by the ordinary method and by suspension, using in each case three ounces of ether, first saturating each quantity of fifty-four grains of pyroxyline in one ounce and a-half of alcohol. One quantity of fifty-four grains he immersed in the ether, and the other he suspended in a piece of cambric, though he preferred Irish linen. By stirring the portion in immersion with a glass rod it was dissolved immediately, but could not be seen through; while in the case of the suspended pyroxyline, in five minutes it was not only dissolved but bright and clear; and Mr. E. stated that if the linen were sufficiently fine, the solution might be iodised immediately; and if the bag were preserved, plain collodion could be kept ready for use to dress wounds, which was a desideratum to photographers who were constantly using cyanide of potassium. Mr. E. then exhibited the means of drawing off the supernatant liquid from the refuse after washing without disturbing the precipitated chloride of silver. He did this by means of a syphon, with its end kept floating on the surface by means of an india-rubber ball, with a pin attached to prevent its descent into the precipitate as the supernatant liquid ran off. Mr. E. then, by means of a Florence oil flask, with its neck inverted and suspended in a funnel with filtering paper in it, exhibited a self-supplying and self-stirring filter. Mr. E. also stated that he believed it was not generally known that chloride of lime would remove silver stains if afterwards washed with hyposulphite of soda.

The CHAIRMAN announced the presence of M. Joubert, who had kindly promised a present of some proofs taken by his new process.

M. JOUBERT then exhibited a portfolio of prints produced by his process, which excited very general admiration — one a representation of old stone ruins, which being placed under a hand lens exhibited none of the granulation so objectionable in ordinary carbon prints.

The CHAIRMAN said, if all we have heard of this printing process be correct, it promises to revolutionise the whole photographic system of printing.

Mr. SILVY presented to the Society three large and very fine prints of his own production.

[It would appear from the preceding that Mr. Ennel had not a very exalted opinion of the photographic skill of his audience. As a lecture to *tyros* in the art it might have been pronounced good — and as we have readers who are but novices as yet we report it — but, as a communication to the Photographic Society, we certainly consider that it partakes largely of the ludicrous. Surely Mr. Ennel cannot have mixed much with his *confreres*, or he would have been aware that there was really scarcely anything of novelty in his remarks.—ED.]

NORTH LONDON POHTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of the Association was held at Myddelton Hall, on Wednesday, the 30th ult.; GEORGE SHADBOLT, Esq. V.P. in the chair.

After the usual business of the Association had been disposed of, Mr. G. W. Simpson read a paper *On the Positive Collodion Process*, with some remarks on the alabastrine process, illustrated by a large number of specimens. [See page 312.]

A vote of thanks was given to Mr. G. W. Simpson for his interesting paper; and a discussion ensued on the permanency of pictures taken by the alabastrine process. Mr. Simpson informed the members that many of the specimens on the table had been taken more than three years; and during that time had been standing on a shelf unprotected by glass or case; and although exposed to atmospheric influence for so long a period, there was no perceptible change, or deterioration in them. He thought this was a good test and proof of their permanency.

Mr. HUGHES wished to know whether the want of brilliancy in some of the coloured *non-inverted* pictures was a general result in this process.

Mr. SIMPSON considered that it arose from the *penetrating varnish* used when preparing the non-inverted pictures, slightly disturbing the powdery surface of the film, rendering it less radiative of the light than before its application: it was not always the case, it might arise from the original picture before the use of the alabastrine solution not being adapted for that process.

The next subject discussed, arising out of the paper that had been read, was the glass used for photographic purposes.

The CHAIRMAN stated that he had examined some of the glass mentioned by Mr. Wall and others at the late meeting of the South London Photographic Society [see page 299], which though very white and brilliant to the eye, did not as a rule admit of the production of negatives without either being fogged or stained. On looking at some samples in Messrs. Cotton and Wall's establishment, from the appearance presented, he was induced to examine the surface by the aid of a powerful lens, and found, as he had

expected, that it was imperfectly polished, being covered with a number of minute depressions, each one forming a centre of chemical action.

Mr. HUGHES stated that some time ago he had among his stock of glass a description that was exceedingly white, very smooth on one side, but hillocky, pimply, and rough on the other, he had taken some of his best pictures on this glass; it gave an exceedingly bright image with great depth of tone, and whenever he wanted to produce something extra good, he always selected this glass, but it was necessary to be very particular as to which side was coated with collodion.

Mr. A. GOSLETT had no doubt, from Mr. Hughes's description, that it was "chrystal sheet;" it was of course necessary to use the right side, for if the uneven side were coated with collodion it would produce a very unsatisfactory result. The best glass, in his opinion, was "*polished* flatted crown:" this is flatted crown polished by hand, but previously flattened by fire, which he explained was done by passing a hot iron over one side of it to reduce irregularities.

Mr. D. W. HILL always used patent plate, after losing many good negatives in flatted crown by breakage in the printing-frame.

The CHAIRMAN then directed attention to the next point of importance noticed in Mr. Simpson's paper, viz., the cleaning of glass. In his opinion there was nothing better than old collodion.

Mr. HUGHES remarked that the only objection was its unpleasant effect upon the eyes.

Mr. SIMPSON had used it, but thought the Tripoli mixture, the formula for making which he had given in his paper, was preferable.

The CHAIRMAN said that with regard to the use of the methylated spirit in the collodion, he widely differed from Mr. Simpson, considering it highly injurious to the nitrate bath. Several members were of opinion that methylated spirit was extensively used in the manufacture of collodion.

Mr. HUGHES said there was no difficulty in ascertaining whether such spirit were used, all that was necessary was to let a little collodion evaporate in the hand; the unmistakeable smell of tar would remain when methyle had been used.

Mr. SIMPSON had examined a large number of collodions, and almost all contained methyle. A few makers were named whose collodion did not contain it.

With regard to the method of iodising the positive nitrate bath the CHAIRMAN said that the method adopted by Mr. Simpson was, in his opinion, decidedly the best (that of leaving in the bath for some time a plate coated with the collodion to be used), as the bath thereby obtained not a simple iodide only, but a first dose of the other salts with which the collodion was sensitised, so essential to the production of a good picture.

A discussion then arose relative to iron developers.

Mr. HUGHES and Mr. SIMPSON were both of opinion that the addition of sulphuric acid to the developer, especially when acetic acid was also used, produced a dead flat picture, or one covered with silver spangles — in fact, it had all the disadvantages of nitric acid, without any of its counterbalancing advantages.

Mr. D. W. HILL stated that a friend of his had produced some excellent pictures by development with formic instead of citric acid.

Mr. WALL also stated the same fact; but the general opinion was that these good results were merely accidental, and produced in spite of its presence, formic acid having a tendency to fog and produce dirty pictures.

Mr. D. W. HILL had also seen good positives developed with protosulphate of iron, without the addition of any acid.

Mr. SIMPSON had in his paper remarked that he thought the beneficial effects of bromides had not been noticed.

Mr. HUGHES stated that he believed he had first called the attention of Mr. Hardwich to the advantages derived from its use, and in the course of experiments he found there is a tendency in bromide, in certain conditions of the collodion, to greatly influence and modify the effects of iodide. [See THE PHOTOGRAPHIC JOURNAL, No. 93, vol. vi. page 111.]

The CHAIRMAN exhibited a number of stereoscopic pictures of China, published by Negretti and Zambra [see p. 315], and a remarkable picture of the spire of Salisbury Cathedral, by Mr. Sedgfield, which appeared horribly distorted in looking at it in the usual position of the stereoscope, owing to excessive "cocking up" of the camera; but on changing its position and looking upwards, the picture assumed a natural appearance.

The CHAIRMAN also exhibited several stereoscopic sunset pictures, by G. W. Wilson, of Aberdeen, with the sun directly in front of the camera — a position in which it has been hitherto considered impossible to take a good impression. These proofs were very much admired for their brilliant and artistic effect. In addition to the above, he exhibited a small print, on paper, by Mr. Church, of Glasgow, prepared six weeks ago, and kept in a case similar in principle to that of Messrs. Marion and Co., and described at p. 66 of the present volume.

A copy of the PRESENTATION PHOTOGRAPH* for the present year was handed round: the subject, "Tintern Abbey," by Bedford. This elicited general approbation, and a vote of thanks was given to the gentlemen of the sub-committee for the good taste and judgment displayed by them in the selection.

Mr. D. W. HILL exhibited a picture taken by the Fothergill process, with the addition of one grain phosphate of ammonia to the ounce of albumen solution.

Mr. WALL kindly presented a stereoscopic picture of the costly bedstead lately presented to the Queen, for which the thanks of the meeting were accorded to him.

Captain Higginson and Mr. Henry Squire were duly elected members of the Association.

Two of Mr. Moginie's tents were erected in the room for exhibition — one a tent only, the other camera and tent combined, weighing only 9 lbs. They attracted a considerable share of attention, and long after the meeting had closed, many of the members were discussing the merits of both. [See THE PHOTOGRAPHIC JOURNAL for July 1st, page 160.]

The meeting adjourned to the 28th instant, when some *important improvements* in cameras and other apparatus will be exhibited and explained.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE eighteenth ordinary meeting of this Society was held on the 24th ultimo, at the Golf Club House, the President, J. GLAISHER, F.R.S., in the chair.

After the usual business had been transacted, Mr. A. J. MELHUISH proceeded to read a paper "*On Photographic Printing.*" [See page 314].

At the conclusion of the paper a vote of thanks was tendered to Mr. Melhuish.

Mr. Robert Peter Napper was proposed as a member of the Society; after which the meeting adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE second meeting for the session of this Society was held on the 7th instant, at the rooms of the Literary and Philosophical Society, 36, George Street, W. C. WILLIAMSON, Esq. presiding.

Mr. Charles Hebert was elected a member of the Society.

Mr. MABLEY read a paper on *The Focus of Lenses*, which had been written by GEORGE SHADBOLT, Esq., for the Society. [See page 311.]

A vote of thanks was unanimously passed to Mr. Shadbolt for the paper which had been read.

Mr. DANCER having contributed an oxyhydrogen lantern, with the requisite apparatus for the exhibition of transparencies, in accordance with the arrangements in the circulars, the discussion on Mr. Shadbolt's paper was adjourned until the next meeting.

The following members brought transparencies, taken by themselves, for exhibition: — Mr. Patterson, Mr. Wardley, Mr. Young, Mr. Mabley, Mr. Taylor, Mr. Dancer, and Mr. Mann.

The lantern contributed by Mr. Dancer being one of the best construction, and comprising some improvements by himself, for the purpose of exhibiting photographs, the pictures appeared wonderfully bright and clear upon the screen. The pictures were also almost all photographs of the first-class, forming a most interesting exhibition, and were much applauded by those present. The attendance was very numerous.

After a vote of thanks to Mr. Dancer, for his contribution of the oxyhydrogen lantern, and to the Vice-President, Mr. W. C. Williamson, for presiding, the meeting closed.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held on the evening of Tuesday, the 29th ultimo. The chair was occupied by Mr. BROWN, the Honorary Treasurer.

There was no special business, nor had any paper been prepared for reading and discussion. One of the members of the Society, however, having been very successful in photographing several high-class engravings, presented copies of these to his fellow members, and some conversation followed regarding the difficulties incidental to this branch of the art.

* A copy of this beautiful production will be presented to every member of the Association. It is a photographic gem.— ED.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VI. *(Continued).*

THE EYES.

Take, then, the eyes first; carefully and patiently strengthen the lines of the upper lid; *don't hurry;* speed will come with confidence, and confidence with practice. Is the lash of the upper lid dark and long, remember that it falls upon and blends softly with the shadow upon the cornea or white; if it is light, remember that it is made visible by the self-same shadow, and can never be truthfully represented by a mere black line. As the cornea retires from light, observe that it falls into delicate shadow, rendered thus faint and delicate, because from the nature of its surface, it receives a strong reflected light. The iris is outlined, sometimes with a clearly-defined line and at others with a faint touch dying into the white; identity of expression is in no small measure dependent upon the due preservation of this peculiarity — a fact I first discovered from studying photographic portraits, and one strangely overlooked by many very eminent artists, all of whose eyes are defined one way, viz., either with or without a distinct line round the iris. In such points as this it is that photography becomes the artist's best teacher. With tender touches gradually strengthen the shadows beneath the brow and that below the eye, or the lower eye-lid, if the latter be full. Upon the proper depth of this shadow depends the characteristic prominency of the eye, its consequent expression, and, therefore, the preservation of likeness. Now, with a few vigorous touches, put in the pupil of the eye; finish the iris, carefully preserving its transparency by strengthening the light reflected through its shadowed side from the lighted portion (see maxim 46). The gleaming character of the fluid found in the corner nearest the nose must be faithfully preserved. Remember that what is called "the white of the eye" is not by any means white, for, being overshadowed by the thickness of the eye-lid and the length of the projecting lash, and being in part concealed from light by its receding nature, it exposes a very minute portion of its surface to direct light; therefore, retain the delicately-shaded appearance it has in your photograph by keeping it down, and strengthening its shadows and tone in exactly the same proportion with the rest. The gleaming spark of light found on or near the pupil is put in with a minute touch of Chinese white. In the photograph this will very probably be represented by a glare of white, destructive of all expression, and giving the appearance of "a cataract." Much as this has been decried by artists, *it is truthful.** Painters, to give unnatural prominency to the spark of light, place its representative dot of white in the midst of dark touches; but in nature we find the spark of intense light, reflected from the eye, is situated in the centre of other light of increased magnitude and diminished intensity. Photography seizes the larger and inferior light, and represents its intensity *truthfully* with *white*, and, therefore, lacks the means of representing the increased brilliancy of the minute spark, which is consequently swallowed up in the white patch representative of the less intense light. *Bear this in mind, if you please, whenever your photograph represents polished surfaces.* Painters having only white to represent the most brilliant light, have recourse to art to force the brilliancy of their white pigments; but photography can claim no such assistance from its own resources. (See maxim 31.)

If you place your spark of light as the centre of another light graduating into the local colour or shadow of the iris or black of the pupil, you will produce an effect which I think is most true to nature; if you place it in the midst of dark touches you will obtain an effect most striking and pleasing to the uneducated eye. Without comment I leave to you the choice, which a few experiments may best aid you in making.

The cavity of the eye is generally observable — sometimes very distinctly, sometimes faintly, but always more or less. It is sometimes indicated by lines, sometimes by a mass of half tint, and sometimes by a very delicate and scarcely perceptible shadow. In either case its faithful rendering is of importance; so pray don't overlook its preservation.

* I remember reading in, I think, the "Quarterly Review" a most ably and powerfully written article upon photography, in which the writer, mistaking these broad white lights for positive high lights, ridicules them as exaggerated and untruthful. This author should have remembered that it is only by the degredation of minor lights that painters make white serve to represent the high lights, and although photography, lacking this power, cannot give high lights, the lights given are none the less truthful, both in regard to size and intensity.

THE NOSE.

Let us now take our lady or gentleman by the nose. Say we have a three-quarter view of a face to work on; the nose is relieved against the "cast shadow" or the shadowed side of the face. Strengthen with the same patient care I have before advised the shadow which outlines the nose; do so tenderly, with a light hand and a delicate touch, or we shall have a hard streak of black paint instead of a sweetly graduated shadow. (See maxim 7.) This done bring the shadow softly into the delicate tones between the nearest eye and the nose — *don't hurry*. Now touch the shadow under the nose, remembering that it is not a mere black patch but is composed of intense touches of dark, which give vigour of effect, of reflected light, and half tones; which prevents harshness and crudity. Examine your photograph carefully, and, if it be a good one,* you will see that this is the case. That done touch in the aperture of the nostril, gradually strengthening it until it is of the required intensity; it must not be too black, because not only is light reflected into the opening from below, but also through the semi-transparent flesh below the bone of the nose. In delicate children and females it will be lightest, in men and aged persons darkest. Trivial as some of these points may appear to the unthinking, the thoughtful artist has learnt to appreciate them at their full value, and I do not urge them upon your attention without having good reason for so doing.

The author of the preceding paper has, in order, to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

J. G. — I am not aware. If I can procure the information it shall be inserted in the number for January.

John Blunt. — You have jumped at the middle of the ladder and missed it; why not begin at the bottom? — that is to say, with the lesson commenced in my last.

L. T., City. — Melt white wax in a clean pipkin; add turpentine; colour as usual; place the print against the window (unmounted of course), and carry a wash of colour over the back of the hands and face; then apply the wax (hot), and when dry mount it upon white card (the yellow will make it appear horn, and not ivory-like as you imagine).

Miss D. — The first book I cannot conscientiously recommend, but the "Harmonious Colouring" is a very excellent little work. Field's "Grammar of Colouring" is the best and cheapest. Your last question is very complimentary, but I am not the gentleman described as "the first photographic colourist of the day," and am anxious to know who is the first. You must test him as they do puddings. No one can blame you for seeking information wherever it is to be found: it is the right way to obtain it. I do not receive pupils just now, my days being so much occupied.

G., Daintree. — I have, with some trouble, ascertained how the new French pigments are made, but have not tested them. If you do so first, please to let me know the result. I have great hopes of the permanency and brilliancy of these new paints. The composition is — equal parts of purified yellow wax and linseed oil, with four-fifths of spirits of turpentine, and half the first quantity of common resin. The wax is dissolved in the linseed oil first, and the resin in spirits of turpentine, by heat: they are afterwards mixed and used as a vehicle with the ordinary oil colours. Thin with turpentine. I fear they will not dry very quickly. See my reply to "J. Blunt."

James Pearson. — It should have been "too black," or, better still, too dark and too cold in tone. This gentleman asks pardon for mentioning some remarks made upon these instructions, to the effect, in plain English, that either I (being a professional) am a fool to give information that will decrease the value of photographic colouring in the market, or a knave, professing to teach and doing nothing of the kind. Don't be startled, James, to see how ugly these remarks look thus translated into their true meaning. Tell the wiseacres who made them that monkeys are very cunning, but not very wise, and that cats are more celebrated for suspicion than any other beings. There are small minds which have so little information to spare that they never give any away, and artists who, being conscious of the ease with which they may be equalled or surpassed, are jealous of all rivals. I hope to prove myself neither one nor the other, to all my pupils at least. As to the remarks made by strangers — we must bear slander while we are here, and may as well do so patiently. You will be rather grieved that you repeated these remarks, perhaps; but I thank you for the laugh they provoked. It's very natural, you know, after all — *to some folks.*

* The student will perceive that I suppose him to be working upon a good specimen, and upon a subject posed and lighted after a style most commonly adopted. As I intend to take two or three such imaginary photographs, and go through the process of touching them in the above manner, any pupil of mine may, if so inclined, send a print of the photograph he is desirous of practising upon, and I will speak of that in the place of the imaginary specimen.

Letters to a Young Photographer.

No. XXV.

My Dear Eusebius,

There remains but little more for me to do in my task of initiating you into the arcana of photographic methods, manipulations, and processes. You have now a large field wherein to exercise your ingenuity, and when that is exhausted, you may turn to the cultivation of your taste, and I hope you will find an instructor as anxious for your welfare as myself. Like most verdant youths, you can quickly recognise a recipe or a formula, because you can reckon it off quickly at your finger's ends; but you are dull at comprehending the value of a principle. If you wish to become an artistic photographer, you must master the principles of art, and if you encounter as much trouble in finding them as I did you will regret rejecting my endeavours at smoothing your way over a very rugged road. The principles of mechanics and of chemistry you will find laid down with great precision and clearn ess by many able writers, but I cannot recommend to you a book wherein you will find a clear exposition of the principles of art. On that subject there is much dogmatism, absence of precision, and of induction. It offers as wide a field for conceited opinions and arrogant assumption, as politics and religion.

* * * * * * * * *

Now, my dear Eusebius, the curtain is about to fall upon this monologue. You know the proverb, that "no man is a prophet in his own country:" it applies to myself in an eminent degree. For many long years I have been professor of things in general in this country, and have reaped small gain and less honour. But I am happy to be able to inform you that I have lately received a curiously sealed packet, bound with coloured silk, heavy withal, which upon opening, I find to be a communication from China.

And lo, dear Eusebius, I must depart in the first ship that sails. Perhaps my next epistle will be dated from the Mountains of the Moon. Adieu, dear Eusebius. Farewell. *Leben sie voll. Addio.* Good bye, God bless you! *Au revoir.*

Photographic Glossary.

Varnish for Positives on Glass — Glass positives are backed with black varnish, or other black material, such as velvet. It is first necessary to protect the collodion film, and this may be done with albumen or solution of gum-arabic. The black varnish is composed of bitumen dissolved in camphine, or in essence of turpentine, to which a little wax is added to correct its extreme brittleness. The following is a good formula:—

Camphine	100 parts.
Bitumen, pulverised	20 „
White wax	4 „
Lamp-black	1 to 2 „

Dissolve the mixture by a gentle heat, shaking the bottle frequently; filter through flannel, and preserve in a well-corked bottle.

Wax — A well-known substance secreted by the bee, and by various plants. It readily dissolves in the fixed and essential oils, in boiling ether and alcohol, in turpentine, paraffine, &c. It is much used in the waxed-paper process in photography.

Varnish for Positives on Paper—Positives on albumenised paper, when mounted and highly varnished, appear as brilliant as when viewed under glass, and are, moreover, protected from atmospheric agencies, which sooner or later deteriorate them. In selecting the materials for a varnish care must be taken to remove all discoloured pieces of resin, as well as those of other qualities which fraudulent dealers frequently mix together. A good varnish may be prepared according to the following formula:—

Alcohol	100 parts.
Powdered glass (or washed silver-sand)	20 „
Mastic in tears, washed in alcohol	15 „
White elemi resin	8 „
Venice turpentine	8 „
Dammar resin	16 „

Spirit varnish does not, like turpentine varnish, improve by keeping; therefore, as it is quickly prepared, it should only be made as wanted. The addition of one per cent. of camphor preserves the varnish from growing darker, but the bottle containing it should be kept in the dark.

Whey — The serum of milk, which separates from the curdy or cheesy portion upon the addition of acids, &c. It consists of water, sugar of milk, lactic acid, and other substances. It is used to prepare the paper in positive printing by development.

Xyloïdin — A name given to soluble gun-cotton, &c.

Zinc — The iodide of this metal is sometimes employed in photography as a sensitising agent, but it is inferior to iodide of cadmium or potassium.

Foreign Correspondence.

Paris, December 9, 1859.

M. Niepce de Saint Victor has made another communication to the Academy, on the action exercised by light upon certain aqueous solution of substances previously experimented upon in the solid state. Dr. Draper had already shown that when a solution of peroxalate of iron is exposed to the light a gas is disengaged, and the iron acquires the property of precipitating salts of gold in a metallic state. An application of this fact was made in constructing a photometer, in weighing the quantity of gold reduced. Upon this hint M. Nièpce made the following experiments:—It is well known, that next to gallic acid, oxalic acid is among organic acids that which most readily reduces the salts of gold; but if we solarise a solution of oxalic acid, it then reduces chloride of gold more rapidly. It is the same with the other organic acids, which, in different degrees, can reduce the salts of gold, and even of silver uninfluenced by light. He next solarised a solution of nitrate of uranium in distilled water, and, separately, a neutral solution of organic matter. If the first solution is not neutralised by ammonia or yellow oxide of uranium, it will not reduce (at least in the same time of solarisation) chloride of gold, while in the opposite case it does reduce it.

As to the second solution, it gave no trace of reduction; this was owing, perhaps, to the substance not being sufficiently solarised, for it is certain that starch and gum can be partly transformed into *glucose* by the influence of light solely.

Now, if we solarise a mixture of nitrate of uranium and of neutral organic matter in solution, contained in a bottle which it entirely fills, and is hermetically sealed, this liquid reduces the chloride of gold and nitrate of silver after a very short solarisation. The reduction becomes stronger in proportion as the exposure to light is prolonged. There is, however, a moment when the reduction is at its maximum of effect: it manifests itself by a black colouration, which is produced in the liquor immediately nitrate of silver is added to it.

If the solarisation is further prolonged the liquid becomes grey upon the addition of nitrate of silver. It loses more and more its reducing power, and at last disappears altogether with respect to nitrate of silver.

But it is a singular fact that, if we remove the liquid from the action of light when it has attained its maximum of activity for reducing salts of silver, this liquid loses its activity in less than five minutes by agitation in the open air, by ebullition, or by a prolonged repose in the open air; but if, on the other hand, it is hermetically closed, it retains its activity.

With the solution of nitrate of uranium and organic matter, the liquid, under the influence of light, begins to be coloured green if the solution be acid, and violet if it is nearly neutral. If we continue to expose the liquid to the light, we perceive it to become slightly troubled, it then becomes opaline, and more troubled, till at length a precipitate is formed at the bottom of the vessel, and in this state it no longer reduces nitrate of silver, but it still reduces chloride of gold.

If the liquid in which the precipitate is formed be agitated, this precipitate is dissolved completely in less than five minutes, and it also dissolves after prolonged repose.

The action of light may be very favourable upon certain wines; it may impart the character of old wines to them on condition that the action of light be sufficient and not too prolonged, otherwise the wine contracts a disagreeable flavour.

M. Cordier communicated the following fact to the Photographic Society:—A plate coated with collodion, sensitised by iodo bromide of cadmium and an old silver bath, highly charged with ether and alcohol, was exposed to a moderate light for forty-five seconds. During sensitising the door of the operating-room was accidentally opened, but instantly closed. Upon developing it, the picture became a vigorous positive by transparency, while it remained negative by reflected light.

Correspondence.

STEREOGRAPHS.

To the Editor.

Sir,—Permit me to thank you for your valuable criticisms on the newly-published stereoscopic slides. There are many persons, like myself, who are far away from the metropolis, and who have no chance of becoming acquainted with what is being brought out as stereoscopic novelties except through advertisments, and I, for one, am quite tired of spending money on what I find when it arrives is just so much trash, as a rule. I have certainly met with one or two exceptions, but these are rare indeed. Your remarks are just what those situated like myself have been long wanting, critical and descriptive, and written in an independent spirit. To you I am indebted for all the best slides which I possess, for certainly without your notices I should never have known anything about them. I recently obtained, by the assistance of a friend who was visiting London, a number of the interiors by Mr. Sedgfield, which you noticed a short time back, and very much pleased I was when I looked them over. My particular object, however, in writing at the present moment is, to inquire whether you know of any good illustrations (stereoscopic) of the Cumberland Lakes, similar to those of Mr. Woodward's of Dovedale?—I am, Sir, yours, &c. T. C. B.

Bodlingham, 18*th November*, 1859.

[We are unable to afford you the information sought, and as the best means of obtaining it we publish your note.

We received, about twelve months ago, a specimen from a photographer (professional) in the district you mention, which was well executed as regards the negative, but a little tame in the printing. We cannot now recal his name; in fact, we are not sure that we were made acquainted with it. Doubtless, however, some specimens are to be had.—Ed.]

MEMORIAL CARDS.

To the Editor.

Sir,—Knowing that you are at all times glad to make public any little thing that may tend to advance photography and all connected therewith, I enclose a specimen of what I think a new idea (at least I have never seen or heard of it before) for the improvement of our memorial cards. I need not explain, as the specimen will show for itself. It would also be a nice way of getting up portraits of our deceased great men, such as Stephenson, Brunel, &c. Of course the style of the cards could be varied according to taste, and it would be an improvement were the oval or other shape to be cut in the card.

Should you deem this worthy of notice your mention of it in the Journal will oblige.—I am, Sir, yours, &c. WILLIAM J. HAWLEY.

Glasgow, 8*th Dec.*, 1859.

[The card enclosed with the preceding note is a black bordered one, with a tablet embossed thereon, in the centre of which a photograph of the deceased, in the medallion form, is attached, space being left for the inscription.—Ed.]

PHOTOGLYPHIC ENGRAVING.

To the Editor.

Sir,—I send for your inspection a proof from a photoglyph plate—the subject, *College Green, Dublin*—from what is called an instantaneous photograph, untouched, executed by Mr. Fox Talbot's new process.

I have from time to time tried all the processes for the engraving of photographic pictures, including the daguerreotypes; and, as a practical engraver and a photographer of upwards of twenty years' practice, I consider the photoglyphic process far superior to all others—in fact, I can produce with it all that can be desired in the representation of animate and inanimate objects, preserving the faintest tracery, the half-tone and gradations of tints, to the deepest shades, and in no way to use the graver except for the margin and name. At an early date I shall send you for publication the plans I adopt and some specimens.

I consider this the last of the many inventions and improvements made by Mr. Fox Talbot crowns the capitol of photography, and hope to see the day when her most gracious Majesty (an amateur engraver and photographer herself) will confer on Mr. Fox Talbot, the father of photography, some distinguished mark of her favour, for his invaluable services to this infant art—an art calculated to extend still further the education and comfort of her subjects, and to surround them with whatever is beautiful in science and in the useful and ornamental arts.

Wishing you and The Photographic Journal every success, I am, Sir, yours, &c. FRANCIS S. BEATTY.

16, *College Green, Dublin.*

[We have received Mr. Beatty's specimen, which shows considerable advance in photoglyphography, but there is still much to be done. We shall be obliged for his communication, as there are many who will be glad to receive hints in practising this promising art.—Ed.]

EUSEBIUS AGAIN.

To the Editor.

Sir,—Pray permit me to trouble you with one more short note. I am much gratified that my master has returned to the instruction he is so ably qualified to carry out, but I fear you have mistaken my object in writing to you. I do desire to become a photographic *artist*, but really did not perceive that novel theories upon abstract principles could be of much service to me in this regard.

With reference to my grandmother's letter, you must know that it originated in the fact of my master's gift of a "penny meerschaum and four ounces of the best 'cnaster;" and also that the dear old lady has a pious horror of hair upon the face, as, doubtless, she would have had of hair upon the head if she had been born a Chinese.

I trust, therefore, that my kind master will continue his pleasant and instructive letters, and receive back with his old cordiality his really earnest scholar, EUSEBIUS.

[We thought that it was only in the Emerald Isle that pupils dictated to their masters the method of teaching. We really fear you want to be a pupil of the "handle" school.

We are quite at a loss to understand your reference to your grandmother's horror, or what it has to do with *photography*. We fear that you have been trying your hand at a digression.—Ed.]

ANSWERS TO CORRESPONDENTS.

CHALLENGE.

We have received from "An Amateur" three specimens of landscapes from negatives, by collodio-albumen process (Taupenot's), with a challenge to other photographers to compare specimens by the same or other processes. We need scarcely say that we shall be most happy to receive and report on specimens sent in answer to this challenge. We are informed that the printing of "An Amatuer's" specimens have been done by Messrs. Frith and Hayward. We congratulate them upon having turned out something truly magnificent in the printing way; and can only say that, if they print thus as a rule, we think they will soon have more work to do than they can well accomplish.

Thomas.—1. No. 2. The last named.

Bailey.—See the article mentioned in our last.

Quixote.—It would be a work of supererogation.

J. C. R.—Too complimentary to publish. Thanks all the same.

R. B * * *—Not good enough to notice: we should only do you harm, as we always report as we find.

C. Turner.—Your stereographs have not sufficient merit for any extended notice, they are passable, that is all.

G. F. H.—You are too exacting; but as a *Liverpool* brother we will indulge you as soon as we can find time—no easy task.

Green.—See Mr. G. W. Simpson's paper in the present number. You want a larger bath; with so small a quantity as you name it is soon exhausted.

Convex.—The best work on optics that we know of is that by Coddington, but unless you are something of a mathematician you will not comprehend it.

W.—We have no further information than what we published relative to Mr. Lloyd's apparatus. We do not understand what question you desire to put "on cameras."

R. S. D.—What *defect* of vision do you refer to? Unless we misunderstand you, we differ from you entirely, and are of opinion that, excepting a person be *blind*, with one eye he can see as perfectly with the stereoscope as without. Neither more nor less.

W. Pae.—There is a chapter on colouring stereographs on paper in the new edition of a cheap pamphlet on "Harmonious Colouring as applied to Photographs," just published by James Newman, Soho Square, London. See also Mr. Wall's article on colouring.

James Hilditch.—Certainly the chances of staining are reduced by employing a glass dish in which to develop negatives, face downwards, provided the dish be *properly cleaned*. There is no objection to the employment of gallic acid for the purpose, except loss of time.

A Poor Photographer.—The availability of your condensing lens depends upon its focus, which must be *longer* than that of the combination by which you wish to enlarge, and it should be so fixed as to bring rays to a focus, *not* on the front lens of your portrait combination, but at its optical centre. See a paper in the present number on this point.

Alignis—1. Leamington; you well understand this allusion. 2. No objection. 3. Iodine in the collodion tends to render the action *slower*, is a remedy to some extent against fogging, in consequence of its setting free *nitric acid* in your bath, which you will find becomes more and more acid, and your pictures weaker and weaker. 4. Yes, a bromide in the collodion is decidedly useful, say half a grain to one grain of bromide of cadmium to each ounce of collodion. Too much bromide weakens the density of your proofs. 5. Add neither ether or alcohol to your nitrate bath, but coat a plate with the collodion you intend to use and leave it in your bath all night. 6. Not good. 7. You do not state whether your lens is a single or double combination, how then can we judge?

⁎ A great press of matter has compelled us to leave over several articles in type, amongst which are an article on Mr. G. W. Wilson's Stereoscopic "Scottish Gems," "Illustrated Description of the Achromatic Mirror Stereoscope;" "Notes of a Photographic Tour in the Holy Land," notices of "New Books," &c.

THE BRITISH

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EDITED BY GEORGE SHADBOLT.

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PUBLISHER'S PREFACE.

The present Volume completes the SEVENTH year of the existence of this Journal. This special fact must form an apology for the unusual intrusion of this notice on the present occasion.

The second Photographic Journal established in order of time, the Publisher has aimed at making it the *first* in point of excellence and of usefulness to the adherents of the Art-Science of Photography. How far this intention has been fulfilled it is left to its numerous readers to judge; but, if position, influence, and circulation be a criterion, THE BRITISH JOURNAL OF PHOTOGRAPHY has taken the lead among the Journals devoted to the Art.

On thus completing his apprenticeship to the cause of photographic literature, the Publisher presents his acknowledgments to the Editor and his *Confrères*, and to the regular and occasional Contributors to its columns (its correspondents embracing the most eminent names connected with Photography), for having enabled him to attain the foremost position.

The Publisher cannot forbear especially acknowledging his indebtedness to the esteemed Editor, Mr. GEORGE SHADBOLT, for his hearty co-operation, and for the thorough honesty of purpose and unwearied attention to the interests of the Journal which he has brought to the fulfilment of his editorial duties.

To Mr. T. F. HARDWICH, late of King's College—who is appreciated throughout the civilised world as a profound scientific chemist and popular and eloquent writer on Photography—the Publisher feels obliged for his lucid "Comments" on the chemical aspect of the science which appear periodically in these pages. Numerous correspondents have signified their high appreciation of Mr. HARDWICH's articles in this Journal; and to that gentleman its readers are indebted for much valuable chemical information not bearing his name.

Mr. S. HIGHLEY, F.G.S., F.C.S., &c., as Sub-Editor, has been indefatigable in his duties; and in the Art-phase of Photography, Mr. A. H. WALL has given in the columns of this Journal the benefit of his great experience.

The Publisher assures his readers that the arrangements for continued and, where possible, augmented usefulness are complete and ample in every department. In conclusion, he begs to thank that important section of his supporters—the Advertisers—for the large amount of favour bestowed on THE BRITISH JOURNAL OF PHOTOGRAPHY, and he has no doubt that their continued connexion will be mutually advantageous.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 109, Vol. VII.—JANUARY 1, 1860.

The Title announced in our last not having given entire satisfaction to the Proprietors of the Journal of the Photographic Society, we so far meet their views as to add to our announced title the word "British" as a prefix. The present Number, therefore, appears before the public as THE BRITISH JOURNAL OF PHOTOGRAPHY—a title at once distinctive, and yet bearing the impress of its former existence as closely as our understanding with the proprietors of the London Society's Journal will fairly allow.

In order to prevent confusion to our readers and further derangement of our plans, we have arranged matters so that the appearance and general aspect of the Journal will be so like to what it has been during the last twelve months, that unless special attention were particularly directed to the point we question whether there are many of our readers who would have detected any change. In this we believe we are acting prudently for the interests of all parties; for there never was a question of dispute relative to any supposed resemblance between this Journal and that of the Photographic Society, but upon the words of the title only, and this being now happily set at rest, we hope to maintain those relations of amity and goodwill with our elder contemporary that have never been interrupted but upon the one point of difference now removed. May we both enjoy a long career of usefulness.

We find on looking over our summary of the past year's photographic history that we have inadvertently committed an error in attributing to Mr. Heisch the credit due to Mr. Thomas R. Wheeler, the accomplished Secretary to the Blackheath Photographic Society, for testing the value, as a photographic agent, of Dr. Schweitzer's solvent of cellulose, the oxide of cuprammonium. This arose from our having trusted to memory instead of referring, as we should have done, to the papers which have already appeared in our pages, and from having Mr. Heisch's name so familiarly before our mental vision in connexion with other valuable chemical investigations, the results of which have been made public at the meetings of the Blackheath Society. We have to crave Mr. Wheeler's indulgence for our mistake: his labours have been no less valuable than those of Mr. Heisch.

In alluding in our last to M. Poitevin's method of producing direct transmitted positives in the camera, we pointed out the probable value of this process (if found readily practicable) for the purpose of taking out-of-door subjects upon a small scale, and subsequently producing enlarged negatives in the megascopic camera, from which to print our positive proofs. It did not occur to us at the time, that by a slight modification of the proposed arrangements we might accomplish the same end in a still more convenient manner. Besides our present want of familiarity with the manipulation of the process as given by M. Poitevin, and the consequent uncertainty to be anticipated in its use until we become better acquainted with it, there is also the drawback of its requiring a more protracted exposure in the camera, asserted to be three times as long as when using a plate prepared with the same collodion and calculated to produce a negative impression. Now by taking sharp negatives of small dimensions—say, for instance, of the usual stereoscopic size—we might by M. Poitevin's method produce enlarged negatives by one operation direct in the camera; and in this case the increased exposure and chances of failure would be of comparatively little importance. The arrangement we are now proposing is substantially the same as formerly, but there is a slight change in the order of the respective manipulations introduced.

As regards the importance of printing direct from negatives by contact, instead of attempting to do so upon paper from small negatives in the enlarging camera, we were much impressed by a remark made by Mr. Beattie, of Bristol, in a conversation which recently took place between us. This gentleman pointed out that artistic effects are much more under control in the former case, especially as regards the backgrounds of portraits —a proposition we imagine not likely to be called in question.

We have upon several previous occasions drawn attention to the desirability for reform with respect to cameras, which, as generally constructed, are too heavy and clumsy, to say nothing of sundry other defects which most of them are afflicted with. We have recently examined a novelty in cameras of very considerable merit, lately introduced by Mr. A. J. Melhuish, of Blackheath—one which, when first it was named to us, we did not at all anticipate would turn out to be of any great importance, but which we now regard in a very different light. The camera alluded to is constructed of *metal*—viz., brass electro-plated, or german silver; and the inventor contemplates, at no distant day, the probability of constructing it also in *aluminium*. The advantages are portability, rigidity, cleanliness, lightness, compactness, and freedom from the liability of becoming deranged either by heat or moisture. As yet we have only seen cameras adapted for taking stereoscopic negatives constructed upon this principle; but we see no reason why they should not be equally efficacious upon a larger scale. It might be objected that metal is easily bent out of shape—in fact it was one of the first objections that occurred to us; but when we saw how ingeniously this has been guarded against by the peculiar method of framing the structure of the instrument, we could not but admit that any force which would bend the metal would break the wood. The weight is not greater than a corresponding wooden camera, and if made of german silver we believe it would certainly be lighter, while in the event of aluminium being employed it would unquestionably be *considerably* lighter. Metal, though a good conductor of heat, when polished, effectually reflects it instead of absorbing it, unless exposed for a considerable length of time to the direct rays of the sun; and a piece of yellow velvet thrown over it when in use would, if needful, obviate that inconvenience.

Besides the material employed for its construction, there are several ingenious and useful novelties applied; for instance, although the dark frames are introduced at the top, in the usual manner, the sliding doors to them open *downwards*, thus totally avoiding the possible ingress of light, and at the same time removing the too frequent cause of tremor when operating under the influence of a summer breeze. The compactness, too, of the instrument is something quite refreshing after the numerous clumsy contrivances that we so constantly meet with. The camera, which is scarcely half an inch each way larger than the dimen-

sions of the glass plates to be exposed in it, *itself* acts as the receptacle for six double backs containing twelve plates, one single back for wet plates, and the focussing screen. Ingenious little metallic strap-like handles enable the operator to draw out the backs and slides with the greatest ease, while they are so contrived that, when not in action, they lie flat against the instrument. The whole affair (lenses and all), when not in use, is packed into a convenient leather case, with a strap, enabling the photographer to carry it readily in his hand or to sling it across his shoulders as he would a telescope.

Mr. Melhuish has also constructed a very excellent folding tripod, which we much admire. We had ourself contrived an arrangement of this nature, which we have had in use for the last twelve months, and which we find extremely handy and pleasant to use, but we prefer Mr. Melhuish's to our own in some respects. We are convinced that these pieces of apparatus will be hailed by many photographers with pleasure.

For the benefit of our numerous readers at a distance from the metropolis we annex illustrations of this ingenious camera. Fig. 1 as it appears in use. Fig. 2 packed in leather case.

FIG. 1.

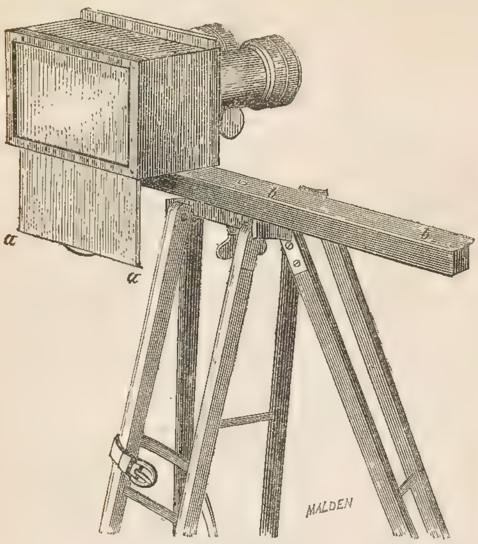
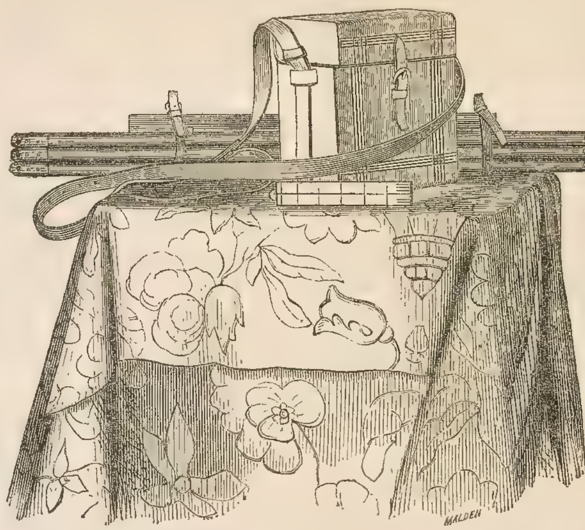


FIG. 2.



ON THE FOCUS OF LENSES.

We have received a note from Mr. M. Noton, of Manchester, kindly drawing our attention to the fact, that the relative proportion between the conjugate foci of lenses which we had imagined to have been first propounded by Mr. Claudet has been long known to those familiar with Smith's *Optics*, and other works, in which an extract, with illustrative diagram therefrom, has appeared. As we had never met with the illustration in question we were previously unaware of its existence.

In consequence of the preceding intimation, we were led to examine more closely the remaining details of our article, and on doing so, perceived that one of the methods we had given for finding the principal focus of a combination, though suitable where the components are *in contact*, does not hold *strictly* true when they are *more or less separated* — because, supposing the components to be of equal power, an object placed in the solar focus of the anterior lens, for instance, will transmit the rays *parallel* to one another, and these falling *parallel* on the other lens, will be united in *its* principal focus; hence the apparent focus of the whole combination would by the rule given be a trifle too long. As we have no object but to afford reliable information, we at once correct the error into which we had by our haste inadvertently fallen.

Since writing the above we have received the following on the same subject, which puts the affair on a still simpler footing:—

"Dear Sir,

"The apparently curious relation, alluded to in your last number, as existing in the conjugate foci of a lens has been recognised at least as long as Dr. Smith's *Optics* (now an old work) has been in being. It has also been copied into several subsequent optical treatises, and has, therefore, no pretension to being a new discovery.

"Nor is it as useful as a much simpler and obvious one. It has always appeared to me that the rule as handed down to the present had been constructed more with a view of putting a *striking* than a simple or convenient ratio before us. The distances (as you have observed) are not taken (or to be measured) from the lens, but from a certain empirical distance (once the principal focus) at either side of the same, consequently we have to add this to each side of the ratio before we can make a practical use of it, and *then* the previous ratio (except in a solitary instance) *no longer exists*.

"To illustrate this, I take from a table constructed in accordance with the rule, four ratios, which for reference sake are entitled a, b, c, d.

a	1 f and 1 f
b	2 f and $\frac{1}{2}$ f
c	3 f and $\frac{1}{3}$ f
d	4 f and $\frac{1}{4}$ f

'f' in the table denoting the principal focus of the lens or feet when the focus is = 1 foot.

"I think it must be conceded that there is nothing in this table to indicate directly any ratio required except that of 1 to 1; and I therefore propose to adopt in preference the more simple and natural ratios of the actual distances from the lens, which, although not as striking perhaps to look at, will be found much more convenient and simple in use; for example:—

a	2 f and 2 f
b	3 f and $\frac{3}{2}$ f
c	4 f and $\frac{4}{3}$ f
d	5 f and $\frac{5}{4}$ f

"In this table the proportions required are at once apparent, while the numbers denote the actual distances required to be used for a focus of 1 foot — the ratio being still of so simple a progressive nature that a table of any required extent can be constructed almost as quickly as the figures can be written.

"Lastly.—The rule by which the foregoing table is constructed admits of the most clear and satisfactory proof by comparison with an exceedingly simple algebraic formula.

"Let it be borne in mind, first—That 'f' represents the focus of the lens, and that this focus is assumed to be =1 foot, or unity; and secondly, that we do not alter the *power* of a lens by using it, whether for bringing parallel rays to a focus or for forming conjugate foci. What we do in the latter case is simply to use a portion of its power on one side, leaving the *balance* of its power to be exerted on the other side — the simplest case of this being that where we use the lens for forming *equal* conjugate foci, and where, the lens being one foot in principal focus, a power equivalent to a focus of two feet is used at one side, leaving an equal power to be exerted at the other side. Now it requires very little mathematical knowledge to perceive that we can only perform the operations of adding and subtracting such powers by treating them *as fractions*—that is by using their *reciprocals*; and thus, as we express the adding of two halfpennies, viz.,

$$\frac{1}{2} + \frac{1}{2} = {}^{1} = 1 \text{ penny},$$

we, in like manner, must, in adding the two before-mentioned powers of two feet each in focus, adapt the formula (p and p^1 being put for the respective powers): —

$$\frac{1}{p} + \frac{1}{p^1} = \frac{1}{f} \text{ (and p and } p^1 \text{ being each} = 2 \text{ feet.)}$$

$$\frac{1}{2} + \frac{1}{2} = \frac{1}{1} \text{ or focus} = 1.$$

From this simple equation we gather that (calling the whole power of the lens 1 or unity) then the sum of the reciprocals of the powers (which are at same time the required distances from the lens) *must equal unity;* or in language less mathematical, any two fractions whose sum is unity will, in their reciprocals, give relative distances of the object and image for a lens whose principal focus is 1, foot, yard, &c.

"And the general arithmetic rule deducible from this, for finding the required distances FOR ANY PROPORTIONAL SIZE OF OBJECT AND IMAGE, AND FOR ANY GIVEN FOCUS OF LENS, is —

"*Add the required proportions together for the denominator of two fractions, whose numerators are the* SEPARATE *numbers. Invert these fractions, and multiply the focus of the lens by each of these for the respective distances.*

"The following examples will suffice. The first of them is taken from the table already given: —

Proportion of conjugate foci 1 to 4 (focus 1.)
$1 + 4 = 5$ for the denominator.
$\frac{1}{5}$ and $\frac{4}{5}$, the fractions.
$\frac{5}{1}$ and $\frac{5}{4}$, the fractions inverted.
$= 5$ and $1\frac{1}{4}$, or 5 and 5-4th, as per table.

"Second example: —

"Assuming the required proportion to be as 5 to 6, and the focus of lens to be 15 inches —

$5 + 6 = 11$, the denominators.
$\frac{5}{11}$ and $\frac{6}{11}$, the fractions.
$\frac{11}{5}$ and $\frac{11}{6}$, the same inverted.
And these multiplied each by 15, give 33 inches and $27\frac{1}{2}$ inches for the relative distances.

"The foregoing I apprehend to be as simple a method as can be devised for ascertaining the conjugate foci in every case. I have endeavoured to render not only the rule but also the principles on which it depends intelligible to all readers. The rule is however strictly correct only for a single lens or combination. You will perhaps, before receiving this, have observed that where a combination of lenses *with intervals between* (such as the portrait combination) is to be used a correction (or allowance) will have to be made, and that consequently the rule you have given is not for such cases strictly correct, though it may be sufficiently near for ordinary practical use. I hope in another letter to touch upon this second portion of the subject.

THOMAS GRUBB, M.R.I.A.

Dublin, December 21, 1859.

PRACTICAL OBSERVATIONS UPON PHOTOGRAPHS IN THEIR RELATION TO ART.

By ALFRED H. WALL.

[Read at the Meeting of the South London Photographic Society, December 15, 1859.]

BEFORE commencing this paper I pondered carefully upon the character I should (or could) give it: practical I had determined it should be, useful I hoped it would prove, and yet it absolutely needed an introduction which in itself would constitute a long communication. I must, therefore, solicit your indulgent consideration.

Whenever I take up modern works upon, or connected with, Art, I find that however much they may disagree in regard to various Art questions of the day, they are generally harmonious in asserting that photographs are "not works of art:" to look upon them as such, says the *National Magazine*, is "a common and ungenerous mistake." Mr. Frank Howard (a gentleman well known as a writer and lecturer upon Art), in the 13th number of the *Journal of the Photographic Society*, pooh poohs the idea of photography rivalling even the humblest branch of art, and, in a sneering spirit, brings prominently forward, and makes the most of, every defect in its productions. A very eloquent and well-written article in the *Quarterly Review* (which is frequently quoted) makes much of all its weak points, also; and in the *Art Journal* for December, 1858, a "dialogue held in an artist's studio" appeared under the title of "photography for portraits," which displayed no little feeling against the new art. You may, perhaps, remember that this dialogue takes place between an artist of the ideal school (so much talked of and so little understood) and a certain vulgar, illiterate, and be-fogged nigger overseer, named, expressively enough, "Dogberry," who, visiting an artist's studio in a great hurry to get his portrait "taken off," naturally stops a tediously long time to smoke a cigar and conduct a long argument with the artist in favour of "photography for portraits." As the artist is a talented, educated, and dreadfully refined individual, and Mr. Dogberry a conceited imbecile, with profound contempt for music, poetry, and painting, but admiring photography and *cheap coloured lithographs*, the aforesaid argument is, of course, by no means one-sided, and everybody wonders at the glorious victory achieved by the representative of Art over his self-created opponent. I might refer to no end of other similar attacks (emanating in many instances from disappointed fifth-rate painters), but it is no part of my present purpose to refute their objections.

If we desire to know why photography is thus disparaged, the reason is so plainly visible, that — putting aside "envy, jealousy, and all uncharitableness" — we have but to look around and see it.

In the first place, among the many thousands of photographs passing before us, how many are there which have the slightest claim to any pictorial element? Alas, the number of these is so sadly small, and photographs have, in a general way, so little pretension to any thing approximating to Art, that we cannot but regard any want of permanence, which most of them may display, as a charitable arrangement of Providence, brought about by the Genii presiding over the beautiful and true. The ease and facility with which a little may be done in photography are its worst foes, and fill our streets with hideous representations of humanity, our folios with drearily uninteresting specimens of snowy or sooty landscapes, and our shop-windows with disgustingly indecent or tawdry theatrical groups, under deceptive titles.

In the next place, as a body, photographers have not set up their standard sufficiently high: great as the superiority of the productions of to-day may be when compared with those of a few years back, in one vital point they are the same — they have no greater claim to artistic qualities. The reason of this may be found, not in photography, but in its students and professors, who take up the art as a mere amusement, a mere mercantile speculation, or as a purely chemical or optical study, without supposing that, as a branch of Art, all the principles of pictorial science are essential to its successful practice. Look at the oldest of our photographic societies, the members of which may surely be supposed to have passed the simply rudimental portion of their art: their studies are still confined to manipulating details; and of all the papers read and discussed at their meetings how few of them have a tendency to increase their conception and appreciation of even the elementary studies of pictorial art! Compare the art-student with the photographic: the first, educated to his profession from early youth, giving years of labour for elementary knowledge, and making every various phase of his progress a subject of earnest study; the other, purchasing his apparatus to-day, and in a few months producing pictures which, being sharp, clean, and well exposed and well developed, seem to him the legitimate *end* of all his efforts. Again, take up the various representatives of photographic literature and compare them with those connected with Art. The first is devoted almost entirely to the mechanism of photography — baths, processes, and modifications of processes, trivial improvements in apparatus, tents, lenses, cameras, and, sometimes, I regret to add, to bickerings and trivial disputes neither dignified nor estimable. The art-publication, on the contrary, gives pre-eminence to scientific principles, enforces rules founded upon the experience of great painters, and the inductive reasoning of great thinkers; the vital importance of which are demonstrated by the productions of the first, the conclusions of the latter, and the instinctive recognition of the uneducated eye.

In making these few remarks I trust I shall not be misunderstood. The mechanism of any art is of great importance, and more particularly is it so in photography; but it should be considered *the means* and not *the end.* The Photographic Journals are invaluable as aids to progress, and we all owe them a deep debt of gratitude; but they should aspire to something above the mere mechanical: their great power should be the chief means of raising our beautiful art to its well deserved niche in the grand domain of Art. But for all the errors I here venture to denounce, photographers alone are responsible; *their* works create erroneous impressions on the public mind, and *their* writings fill the pages of our literary representatives. But our art is young, and has—like other young folk—much to learn.

With these few necessary remarks by way of introduction, I will, without ignoring the existence of serious optical and chemical difficulties, now take my ground, in opposition to the Frank Howard and Ronald Campbell school of reasoners, by asserting that light plays much the same part in photography that pencils do in drawing, and that photographs are the production of the camera in exactly the same sense as paintings are the production of paint; that bad photographs, however numerous they may be, are not more

legitimate arguments against photography than bad paintings are against painting. Being both artist and photographer, my evidence may perhaps be received with less suspicion than it would provoke if it emanated from the first or the last only.

I propose, then, to throw together a few practical suggestions upon composition, the management of light and shade, &c., in their application to photography.

I do not think that our most ambitious branch of photography, viz., that which takes the same relative position as historical painting does to Art, can ever attain a permanent standing; for in historical painting the grand aim is not to represent things in actual existence as they really are, but rather to select the scattered fragments of expression, or beauty, and blend them into one harmonious whole. I shall presently show some specimens to illustrate this point. The legitimate compartments of photography are to be found in groupings illustrative of various incidents—in landscapes and sea views—in studies from the nude, from cattle, and from objects of various kinds—in portraiture—in representations of still life (such as that true *artist*-photographer, Lake Price, has produced)—and in architecture. Surely here is field enough for our labours without hopelessly rivalling unconquerable giants so high above our pigmy efforts!

Of course I can now merely make a *very few brief remarks* upon each of these branches—mere indication of things claiming more important treatment.

In grouping figures to illustrate various incidents, the chief element of success lies in the choice of clever models; and, most decidedly, for mere physical characteristics, we shall find our best subjects in the studios of artists: but for facial expression they will be found almost useless; for this our best models must be sought among men and women whose minds are imbued by nature or cultivation with poetical conceptions, who, feeling deeply, will express correctly the various passions or sentiments required. And here comes the most serious difficulty—poetically organised beings are not frequently found among the class of people who would sit to an artist as a model. Occasionally we meet them. I remember seeing a young gentleman of the shoe-black brigade, who was narrating, to a suspiciously ragged and dirty young urchin, some terrible story, and so full of horror was the one boy's face, and so absorbing was the open-mouthed attention inscribed legibly upon the other's, that I stopped, and found that the brigade boy was simply explaining a passage (in his own emphatic but not very elegant or grammatical language) from some romance of blood, bogy, and blue-fire school. Now, here was, I doubt not, one who might have been trained into a most excellent model: his features were capable of expressing strongly emotions which he was evidently susceptible of feeling deeply, and these are exactly the qualities needed for a photagrapher's model. In most of the photographs of this class which I have seen the models have evidently been chosen for their outside appearance rather than for their capability of expression. Models from the stage are very seldom of use, being of the stage, stagey. I would therefore advise the photographer who takes up this department to cultivate his conception of the picturesque, and look about him for models in the almost unexplored scenes of humble life. In depicting passions we must be careful that by exaggerated expression we do not, as *Hamlet* says, "tear a passion to tatters," nor "overstep the modesty of nature." Refinement must never be lost sight of in every production of art. To *succeed* in this branch undoubtedly requires the education of an artist. Attention must be particularly directed to the study of expression, in order to select that which is most natural, effective, and true to a purpose. Composition imperatively craves *some* study: in groups, crowding must be avoided; ungraceful angles in limbs or accessories shunned; the laws of proportion and symmetry studied. Drawings, paintings, and statuary (especially the antique) should be carefully observed for a perception of the beautiful, and an eye educated to discover it must be arduously sought. The artist should also remember that expression is not confined to the face, but speaks in every motion of the body and limbs, and that certain forms and faces have in themselves poetical expression apart from muscular motion altogether. Variety must not be lost sight of, nor contrast neglected; unity of purpose and the relative subserviency of parts must be attained; breadth preserved, &c. But I must quit this subject (which is indeed a vast one, and in itself sufficient for several long papers), and content myself by simply adding that much may be done for the picture in the printing and development, or when several negatives are used, by varying the exposure in the camera, so as to obtain more definition and relief by stronger tones of light and shade in one portion than another, &c., &c.

Landscapes next demand a few practical hints. In this branch, and that of portraiture, photography has progressed most rapidly.

The choice of light is of primary importance in taking a landscape. If the light be immediately before your camera, the objects in the same position must necessarily be in shadow, which may sometimes greatly aid you (if desirable) in procuring a mass of halftone. A specimen I have brought down, in which the sun has evidently been looking *into the mouth of the lens*, will serve to illustrate this; but another I have will serve to show its general ill consequences. If the sun be immediately behind your camera, there will, generally, be a want of shadow and force of effect. [A specimen illustrative of this was shown.] The position best liked by painters is that in which the light comes from either the right or the left, as we have then strong contrasts of light and dark, unity of half-tints, and powerful relief; but much must, of course, depend upon the character of your view, as even this light in some exceptional cases, might produce a spotty effect destructive of breadth. [Several fine specimens, by Mr. F. Howard and others, were handed round.] Beyond a doubt the most *brilliant* pictures are obtained near mid-day; for both lights and shadows are then most intense, and the exposure is shorter; but photographs so obtained are seldom (I think) very *artistic*. Nearer morning or evening, when the lengthening shadows blend into masses and the lights are not so strong as to be destructive of harmony (in the gradations of tone), will be the best time for an artist-photographer. As some portions of the view must necessarily receive the most light, it would be as well, perhaps, if you could so contrive that the strongest light should be found upon the foliage. The faults I most commonly meet with, in otherwise good photographic landscapes, are a want of shadow and a want of contrast, arising, in many cases, I doubt not, from the operator's almost instinctive dread of the strong lights and darks of nature resulting in a "soot and whitewash" effect in his picture. I think I have brought down sufficient proof, in the specimens I shall now show, of the exaggerated nature of this fear. The stops used in lenses are so various and important in their effect, that you must permit me to advise our beginners to try some few experiments in this direction, if they have not already done so. I am inclined to think too small a stop disadvantageous. Long exposure may destroy some force of effect in the more minute details of the lights; but this is more than compensated for by the greater transparency, detail, and purity obtained in the shadows. Here again, gentlemen, we meet with demands beyond that of the mechanical: here the taste and artistic knowledge of the photographer will surely be of greater service than his manipulatory and chemical skill; for the last is useless without the first. When he takes out his apparatus, he has not only to choose his scene with reference to light and shade, as related to pictorial effect, but, to produce really *artistic* pictures, he must also study the *chiaroscuro* with reference to the peculiar character of the chosen subject, inasmuch as his pictures are, apart from colour, as capable of conveying sentiment as a painter's. This is a fact too commonly overlooked. The mere representation seems nearly always to bound a photographer's aim (and thus it is that there is a strong impression on the public mind that the photographer's occupation is, after all, worthy only of being classed among the mere handicrafts). For instance, gladness abounds in the brilliancy of sunshine; placidness and peace speak most eloquently in the harmonious blending of subdued tones; and a general gloom, with intense black shadows, has a grandly powerful voice when associated with the rugged and the desolate. In printing your picture, its colour may also tend greatly to enhance the sentiment and general effect. I must not dwell longer upon this, however, but content myself by adding that taste, elegance, and expression should characterise all your productions.

Barnard, in his excellent work upon Landscape Painting, while praising photographic landscapes for their perfect representation of tints and shades, says:—"It must however be confessed that, even in the most perfect of these philosophical productions, a certain amount of pictorial effect is wanting, and a deficiency is felt of that concentration of interest caused by a more artistic application of the laws of *chiaroscuro*." This is unfortunately but too true.

Another element of the picturesque has been greatly neglected by the photographer, viz., atmospheric effects.

I do think there never was a greater blunder made than that of destroying the aërial perspective of the extreme distance by obtaining the hard line of a cut-out horizon, and the glaringly prominent truth-and-beauty-destroying absurdity of *a white paper sky*. If we *must* have clean skies, and *will* sacrifice atmosphere and per-

spective to obtain them, why on earth need they be *white?* Are we not able to graduate them with the greatest ease from a gleam of light near the horizon, upwards, into a tone of any depth? Or, better still, cannot we take a second negative of the identical sky spread above our view, and by double printing give our picture an amount of perfection which otherwise it can never claim? The hard horizontal line would even then remain, but it might at least be modified by the aid of a little wool or silver-paper in the printing process.

The effect of atmosphere is also too little appreciated in photographing distance, although it is the most enchantingly-picturesque of all mediums, lending that soft dreamlike obscurity to the fading objects as they dwindle and recede into air, which is most poetically expressive of all the charms of ever-varying nature. Clear, brilliant days for distant landscapes may give that wondrous diversity of detail and distinctness which charms the uneducated eye; but, after all, a mass has similar qualities in much greater perfection, without being either very picturesque or strikingly beautiful. Partially-condensed vapours, or the semi-transparent gleams of partial sunlight are in themselves fruitful sources of effects which rouse the artist into a fervour of admiration and a fever of ambitious anxiety. Many suppose that such beauties defy our art; but I have seen many photographs in which their glorious effects have been very faithfully rendered. You may perhaps remember a stereograph called *The Rising Mist*, published some time since. I hoped I should have produced this and others illustrative of atmospheric perspective, with some which I shall presently send round. [Wilson's sunsets and other photographs were here shown.]

Not to dwell longer upon landscape photography (as my motive is rather to call the attention of members to the wide field open to them for study, and the many subjects upon which it is desirable we should have good papers, than to give to any one of these matters that attention and time which they justly demand), I will now conclude with a few observations upon portraiture.

The remarks made upon grouping will apply with equal force here.

The position of a sitter should be such as will display the greatest variety of graceful undulating lines, or be the most characteristic of the individual.

The head should represent the principal light, and minor lights should graduate from it, as a focus, to the deepest shadows. The effect will derive great force from the judicious introduction of a spot or focus of intense darkness somewhat near the highest light; of course this so-called "spot" must not offend probability, nor destroy harmony.

Photographers are not, as a whole, aware of the great importance to be attached to the preservation of pure whites. If we consider that the lights and shadows of nature range from the intense brilliancy of white light to the absolute darkness of a nearly total deprivation of light — while a photograph can only represent this vast scale by the few tones graduating from white paper (generally seen in a subdued light) to shadows certainly not black, being considerably lighter, as a surface reflecting light — we shall then see how important it is that we should not lessen our scale of tones by substituting grey for white. I do not know a better illustration of this than is to be found in the alabastrine process. Take an ordinary positive with its so-called whites of a light leaden hue — more or less — and whiten it with the alabastrine or bichloride solution, when you will discover that, as the picture whitens, its scale of tones seem suddenly to grow softer and more delicate, and its contours much rounder and more forcible; an effect to be traced solely to the introduction of pure white and the intensifying of the deeper shadows, or, in other words, is in the increased compass of the scale of semitones.

The general faults in most photographic portraits are the absence of reflected light — the over-exposure of the face, to bring out the details of drapery — and (I know I am about to propound heresy) the terrible sharpness of their definition, which I never can reconcile with binocular vision. (I do not recognise the thousand and one cheap abominations in our streets as photographs at all, so must not be considered as referring to such singular productions the general faults of which would alone demand a longer paper.) In illuminating the sitter, the light should enter at an angle of not less than 45 degrees. The amount of direct light should be small, and to give delicacy, transparency, and truth to the shadows, light should be reflected from white screens placed upon the shadowed side of the figure. The object to which you direct your sitter's attention should be dark, as it is less fatiguing to the eye than a light one would be, and also (by enlarging the pupil) improves its expression. Be careful to avoid so placing your white screens as to reflect a glare of white upon the eye. In giving ease to the pose do not carry it into affectation, which is as great a fault as awkwardness and clownishness. The background should spread the light and aid in securing breadth. A very capital one is made by painting it with colour containing more turpentine than oil, and afterwards stippling in, or near, the centre, with the end of a large brush, a colour considerably lighter, graduating it from a centre into the colour first applied.

I must now conclude. In pointing out a new field for our studies, and dwelling upon its importance, I hope, gentlemen, you will assist me in bringing forward papers of *an artistic character*, which, blending with the amount of practical, manipulative, and chemical experience which we already possess, will tend to raise the art we all love high above the sneers and ill-natured attacks of a class of dreaming idealists, who would fain make an artist one of the most mysterious of the world's creations, and his productions things to be viewed with unquestioning faith and superstitious reverence. The cause of Art is at enmity with these worthies.

By way of illustrating my remarks I must refer you to some of the specimens before you.

In the series illustrative of Little Red Riding Hood's tragic story the various expressions on the face of the child will show what a good model can do, as will also that on the face of the female model from Rejlander's *Seven Ages*, and those found on the faces in *The Scripture Reader*, *The Wayfarer*, Robinson's picture called *I know*, and in *Mariana*.

For characteristic effect of light and shade and the expression of sentiment I must refer you to *The Convent Bell*, *The Five Foolish Virgins*, *The Spinning Wheel*, more particularly that with the dark background, *The Abbey Gate in Yorkshire*, by F. Bedford, some stereographs of Rochester Castle and other spots, by our Treasurer, *Guy's Cliff*, Watson's *Roman Bridge*, *The Wayfarer*, and *Tong Village*, by Rejlander.

For atmospheric effects I must refer to the three slides of Wilson's from Aberdeen representing sunsets. These will also serve to show how singularly important a sky is to the picturesque. For instances of the destructive influence exercised by white skies take — *all pictures which have them*, more particularly an exquisite vignette of *Blackburn Priory*, by Delamotte (so sadly spoilt), and *Conway Castle*, by Rosling.

For "breadth" refer to the *Abbey Gate*, by Bedford, one of the most beautiful and artistic photographs in the volume before you — to the third picture of the *Red Riding Hood* series — to the pictures called *The Spinning Wheel*, *The Scripture Reader*, and *The Convent Bell*. Not to delay the discussion, which I hope will follow, I thank you for a patient hearing, and conclude.

THE PATENT METAL CAMERA.

By A. J. Melhuish.

[Read at the North London Photographic Asociation, December 28, 1859.]

I have been requested to call your attention this evening to a camera that I have constructed, which appears to me, and I think I may say to all who have seen it, to possess very considerable advantages over the ones now in use.

Before, however, proceeding to do so, it may be well to consider the conditions required to constitute a really perfect photographic camera; for by so doing we shall the more readily perceive how near each claimant approaches or how far he falls short of the desired standard of excellence.

A photographic camera to be perfect should be made of such *material* as will never, under any circumstances, be affected by change of climate, heat, or moisture — of such material as will neither affect or be affected by the sensitive plates, but will rather preserve them as long as possible, and of that material (if such can be found) which combines with the least weight the greatest strength,

It should be so *constructed* that by no possibility can the light ever reach the sensitive plate — that the shutting of the slide may be withdrawn without disturbing the focus — that it shall occupy the smallest possible space, and be carried as it is used (I mean without taking to pieces) — and last, but perhaps not least, it must be moderate in price.

Now, gentlemen, if I show you a camera which fulfils to the letter all these conditions, I think I may flatter myself that the term so often misapplied may be in this case justly claimed, and that all will concur in acknowledging it to be the *ne plus ultra* of photographic cameras.

We will now run through the various points separately. "A photographic camera should be made of such *material* as can never,

under any circumstances, be affected by change of climate, heat, or moisture." That this condition is fulfilled by a metal camera and is not by a wooden one need not be urged, but is self-evident.

"Of such material as will neither affect nor be affected by the sensitive plates, but rather preserve them as long as possible." The wet collodion slide of my camera being electroplated with silver within and without can "neither affect nor be affected by" the wet plate; whereas with the wooden ones they generally stain the plate more or less, and the plates gradually spoil the slide. Moreover, I think it highly probable that the wet plate which so soon spoils and dries in a wooden slide may be kept in my metal one, which absorbs no moisture and is nearly air-tight, a very considerable time.

"And of that material which combines with the least weight the greatest strength." The new metal camera is constructed of sheet metal so thin and so strengthened by frames of the same that I find that, when made equal in strength to the wooden ones now in use, it is about one-third lighter, and when made of equal weight it is at least double the strength. Should the metal camera have a severe fall it would be bent, and would require to be straightened; should a wooden one meet the same accident it would probably be broken.

"It should be so *constructed* that by no possibility can the light ever reach the sensitive plate, and that the shutter of the slide may be withdrawn without disturbing the focus." The shutter of the dark sliders now in use draws up or on one side; consequently, as all are aware, it is very difficult in full sunshine to prevent the light reaching the plate while opening and shutting the slide. The shutter of the metal camera glides smoothly down without disturbing the most delicately-adjusted focus, thus rendering it impossible for the light by "any possibility" to reach the plate during any length of exposure.

"That it should occupy the smallest possible space, and be carried as it is used." Here all comparison with anything yet made will appear needless when I say that my metal stereoscopic camera, with six double dry plate slides (containing, of course, twelve plates), one wet collodion slide, and focussing frame, occupies less space than an ordinary twelve-groove plate-box. It is carried as it is used.

In conclusion, I think I ought to add that I do not claim to be the inventor of metal cameras. That honour, I believe, falls to M. Voigtlander, of Vienna. Mr. Skaife, too, of Blackheath, has lately constructed a very ingenious little instrument, which, were it moderate in price, would, I think, be much used. He calls it "the pistolgraph" — by means of which he takes "*chromo-crystal pistolgraphs.*" Like Voigtlander's camera, it is made of metal tubes.

But I think, gentlemen, I *may* claim to be the first who has made a metal camera where its many and manifest advantages over wood are not nullified for ordinary use by the singular and inconvenient method of its construction — to be the first who has made a metal camera of *practical* value for general use.

ILLUSTRATED DESCRIPTION OF MESSRS. SMITH, BECK, AND BECK'S PATENT ACHROMATIC MIRROR STEREOSCOPE.

WE recently described in our pages* the excellent hand-stereoscope indicated above, as well as we were able to do so without woodcuts; we have now to present to our readers an accurate illustration of the instrument, with description in the inventor's own words:—

We have contrived this Instrument expressly for the exhibition of paper stereographs, either as mounted in the ordinary way, or, as there is every probability, they will frequently appear as illustrations in books. The principal feature of this stereoscope is the application of a mirror in such a position as that, when the instrument is held facing the light, the picture receives reflected rays, in addition to the direct ones: this double illumination not only imparts a proportionate brilliancy to the photographs, but, from the circumstance of the light falling in opposite directions, there are no shadows to the irregularities upon the surface of the paper, and thus many of these annoying imperfections are rendered invisible.

We have also combined with this arrangement the same achromatic lenses as in our other stereoscope, so as to afford the best definition, and to correct the colour produced on the margins of objects by single lenses. The adjustments for different kinds of vision, as hereafter described, are as complete as possible; and a ground-glass division, which separates the pictures without under any circumstance throwing a shadow, as well as the brass frame, which forms a margin to the object, will both be found of essential service.

SMITH, BECK, & BECK.

DIRECTIONS FOR USE.

The instrument is intended to be held in the left hand by the handle A, and facing the light, the right hand is then at liberty either to shift the views, or to make the necessary adjustments

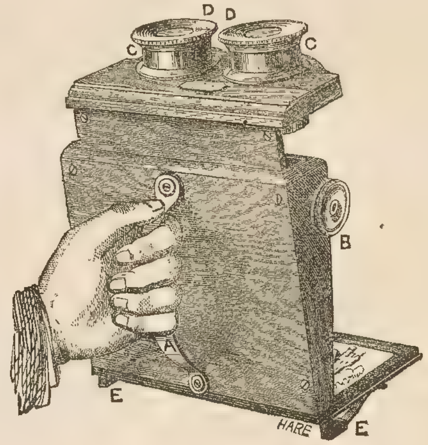
The milled head B is for the adjustment of the focus, by rack and pinion. Those who have "long sight" will require the lenses farther from the picture; and as the full extent of the rackwork is frequently not sufficient, the distance can be increased by drawing out the lenses in their fittings at C C; the reverse is, of course, required for short sight; whilst many of those whose vision is unaffected in either of these ways will be able to see well through the whole range of adjustment.

Every stereoscopic slide consists of two pictures, but they must unite and form one in the instrument. This will generally be the case when the two arrows on the brass rings D D point to each other; but there are some kinds of vision and, occasionally, errors in the slides, which require one or other of the lenses to be slightly turned round in its fitting C. The method of mounting admits of this, and also of their being easily taken out for the purpose of wiping, which should be done frequently.

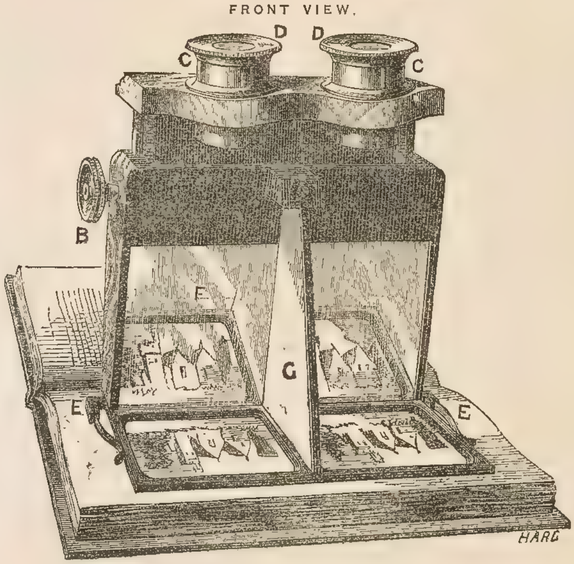
The slides are placed under the brass frame H, and under the springs E; but if the stereograph is in a book, the springs are turned up, as shown in front view.

* Vol. VI., page 284.

BACK VIEW.



FRONT VIEW.



NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

SCOTTISH GEMS.

IN a recent number* we had much pleasure in noticing some very beautiful results obtained by Mr. George W. Wilson, of Aberdeen, in the production of a series of stereographic photographs, in which some highly artistic effects, hitherto unattained by aid of the camera (so far as we are aware), had been accomplished. These were indeed so much out of the ordinary class of stereographs, both as regards execution and subject, that we felt it necessary to criticise them rather as photographic contributions to art, than in our usual manner. At the close of our notice we intimated that there were others which we had to describe under our usual heading, but before proceeding to do so, we may remark, for the information of our readers, that the whole of Mr. Wilson's negatives were taken

* Vol. VI., page 294.

by the moist collodion process, and developed with the protosulphate of iron.

We shall begin with two subjects corresponding to some criticised very recently in these pages, that were taken by Mr. Archibald Burns, of Edinburgh, by the Fothergill process. They are —

The West Door, Elgin Cathedral.—This differs so little from the specimen by Mr. Burns, both as regards the amount of subject included and point of view, that it is really surprising, especially when we know that they were taken at a considerable interval of time between the two. In Mr. Wilson's specimen the spectator is a trifle more towards the right hand side, and the sun was shining when the negative was taken; there is also a figure seated upon the steps leading up to the doorway, and two others are visible in the interior of the ruin. Mr. Burns's negative, on the contrary, must have been taken in cloudy weather, and it is destitute of figures. In all other respects there is no more difference perceptible between them than the usual individuality with which skilled operators invariably impress their works.

South Door of Roslin Chapel.—Mr. Wilson's copy of this subject is taken upon a larger scale than that of Mr. Burns, and consequently less of it is included. The upper windows which form so remarkable a feature in Mr. Burns's, are wanting in Mr. Wilson's copy, but this absence is fully compensated by the increased beauty of the effect of the open doorway, in the embrasure of which a lady is standing, as if about to enter. At the opposite side of the building another door is open, at which there is a gentleman looking in, while still further off is a third open door, through which is seen a row of garden railings, and a portion of the hedge. Of the two windows visible, many of the squares of glass are wanting, and the larger scale upon which it is taken permits of a better examination of the beautiful carved-work with which the structure is adorned. Both of these specimens are in their way masterpieces of art, and we should not like to part with either of them.

We have made mention of these two subjects at the outset, because we were anxious to point out a fact that we think has been fairly proved by a comparison of the respective specimens, viz., that there is nothing inherent in the dry process that should prevent its rivalling the moist one as regards capability of rendering all subjects in a state of repose; but, for the introduction of living subjects, the wet process has a considerable advantage. We think it but right to mention that though Mr. Burns's representation of Roslin Chapel is remarkably graphic and effective, the delicacy and softness of Mr. Wilson's rendering, together with the introduction of the figures, causes his specimen of this subject to be more of a finished picture.

The Interior of Roslin Chapel is one of those beautiful illustrations that the archæologist will delight in. The massive pillars, one of which is known as the "Apprentice's Pillar," seem but barely able to support the capitals and heavy architraves literally loaded with ornamentation of the most florid character. A gleam of sunshine falling on a huge square block of stone glorifies it; and the general harmony of light and shade, combined with breadth and detail, unite to constitute this a perfect picture which the eye never wearies of gazing on, and which, while we gaze, communicates a sensation of satisfaction and repose that is truly soothing.

The Tomb of Sir Walter Scott, Dryburgh Abbey, is an artistically composed illustration of a somewhat ordinary subject, if we except the associations connected with the name. The tomb itself is barely visible; but a portion of the Abbey, under the shelter of which it rests, is seen through a vista consisting of a buttress or other piece of masonry crowned with the straggling boughs of some creeper on the one side, whilst on the other the squamous stem and lower branches of a stately cedar tree complete the balance. In the foreground are several very ancient monuments, and against the railings a figure is leaning contemplating the last resting-place of one of Scotland's most noted sons.

Balmoral Castle from the S.E. (No. 131) needs no recommendation to render it popular. The favourite residence of our beloved Queen would always excite an interest in every British breast, even if it were represented with less perfection than the specimen before us, which, like all Mr. Wilson's productions, is a model of neatness and perfect workmanship. Apart from the association annexed to it, however, it is perhaps one of the least attractive of this gentleman's subjects, in consequence of its inferiority as regards the picturesque, the edifice being too trim and in too good condition to render it a desirable object for an artist. There is a gardener in the foreground guiding a huge mowing machine, drawn by a plump white cart-horse, led by a second man; the grass, however, is rather too dark in tone to appear quite natural, a defect no doubt arising from its colour.

(To be concluded in our next).

THE POSITIVE COLLODION PROCESS, WITH SOME REMARKS ON THE ALABASTRINE PROCESS.

By G. Wharton Simpson.

(Continued from Vol. VI., page 314.)

THE NITRATE BATH.

This, as I have already said, I prefer sufficiently rich in silver to give a creamy film — about thirty-five grains of pure recrystallised nitrate of silver to the ounce of distilled water. A simple and efficient mode of charging with the iodide of silver is to coat a large plate with iodised collodion and leave it for a few hours in the bath. If on trial a clean bright picture free from streaks or fog be produced, the bath does not require further preparation. This, however, rarely happens. The addition of a quarter of minim to one minim of nitric acid is generally required. I usually commence with the smallest quantity, and increase it until on trial a clear brilliant picture is the result. The bath once in condition, I find it generally continues so for a very long while on being filled up from time to time with a forty-eight grain solution. If from long use a large quantity of ether and alcohol have accumulated in the bath, I pour it into a wide-mouthed bottle or jar and place this in another vessel of hot water, in order to evaporate the excess of spirit. This I have generally done in daylight and have found a blackened precipitate. On filtration I have invariably found the bath work perfectly. Beyond this I rarely like to interfere with a bath once in good condition. And notwithstanding that I find some variations at different times in the condition of the bath, I do not remember in the course of many years of photographic experience to have had spoiled a single ounce of bath by the ordinary process of working.

DEVELOPING SOLUTIONS.

The preparation of these must depend on the class of picture to be produced, as much of the tone of the picture depends upon the developer. The salts of iron are in all cases preferable to pyrogallic acid for positives, giving a better picture with less exposure. Even when the latter is used with the addition of nitric acid the picture lacks brilliancy, and the exposure is long. The class of picture produced by development with the protoxide of iron is materially affected by the nature and quantity of acid with which it is combined. I will mention the results given by two or three different formulæ. The first I shall name contains

Protosulphate of iron	15 grains.
Glacial acetic acid	20 minims.

The amount of acetic acid may vary with the temperature from fifteen minims in winter to half-a-drachm or upwards in summer. Very certain results may generally be obtained with this developer. The pictures are bold and vigorous, possessing at the same time sufficient half-tone to give roundness and good modelling. They are, however, especially with a collodion containing a bromide, generally low in tone, having creamy-looking lights and entire absence of metallic lustre. The addition of ten grains of nitrate of potash to an ounce of the developer gives, from the formation of a small portion of protonitrate of iron, a slight accession of metallic brilliancy and whiteness to the picture.

Another developer giving generally very fine results, contains

Protosulphate of iron	20 grains.
Glacial acetic acid	20 minims.
Nitric acid	2 „

With a collodion iodised with iodide of potassium, about three-and-a-half grains to the ounce, and as much bromide of potassium as it will dissolve — which is a very small quantity — I have produced exceedingly fine results. Some of the best collodion positives I have seen were produced by this combination.

Another developer contains

Protosulphate of iron	10 grains.
Nitric acid	2 minins.

This gives an extremely metallic picture, with plenty of half-tone, not unlike the general effect of a daguerreotype, but greyer in the whites. If the exposure be at all too short the picture is covered with metallic spangles; but if carefully timed the results are pleasing, but not so vigorous as those produced by either of the former developers.

The preparation of protonitrate of iron, or rather of protonitrate and protosulphate combined, given by Mr. Sutton* is an exceedingly fine developer. The formula is as follows:—Dissolve one ounce of powdered nitrate of baryta in sixteen ounces of water, and when dissolved add two drachms of nitric acid s.g. 1.400. To this solution add one-and-a-half ounce of powdered protosulphate of iron. When thus dissolved, filter to remove the insoluble sulphate of baryta. The solution is of an apple-green colour, and contains two

* This differs from the original protonitrate developer of Dr. Dymond in containing excess of protosulphate of iron, and being consequently more active.

parts of protonitrate of iron and one part of protosulphate of iron. A full amount of exposure is required, and the development is rather slow. The resulting picture is somewhat metallic and very pure and brilliant in tone. This developer is somewhat feeble in cold weather, and may with advantage have a still larger proportion of a solution of protosulphate of iron added.

Some of these developers, the first mentioned especially, may with advantage to the tone of the picture be used over again. The principal difficulty this practice introduces is some uncertainty as to the exact strength of the developer after once or twice using, and of the relative increase of exposure rendered necessary.

The addition of sulphuric acid I have not found in any case an advantage. A large amount of unpleasant sparkling effect, with scarcely any distinction between high light and half-tone, being generally the result.

In each of these formulæ a certain quantity of alcohol will be required. The exact amount will depend somewhat on the collodion film, and more upon the condition of the bath. If the bath has been some time in use and contains a large accumulation of alcohol, the developer will require a corresponding amount in order to make it flow freely over the plate without running in greasy lines, each one of which will cause a stain, the result of uneven development. I have found in practice that methylated spirits answer perfectly well for use in the developer.

In all cases I prefer to give just such exposure to the plate as will cause a somewhat slow and deliberate development: a richer, bolder class of picture, with perfect gradation from the highest lights to the deepest shadows being produced. Pictures developed at a blow, or with great rapidity, I have generally found flat and worthless.

It is a point of great importance, and one on which sufficient stress is not generally laid, to wash very thoroughly after development before fixing. Having been a great deal engaged in tuition, I have found this a point much neglected amongst amateurs, and not always well attended to by professional photograpers. It is a most prolific source of stains. The reason probably is that it is very common to develop rapidly, and there is then a temptation to hurry the plate into the fixing bath to prevent over-development, as the development, especially in an over-exposed picture, proceeds rapidly even during the progress of washing.

(To be concluded in our next).

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. XI.

Upon returning from Mount Carmel we found that the *Tarbucket* was to be detained yet another day. Such is the fashion with the Eastern steamers, and we were fain to submit. But as we sat in the cabin in the evening, an idea occurred to me which the rest of the party seized upon with avidity.

It was to go on to Beyrout by land, visiting Tyre and Sidon by the way. Early in the morning I went ashore and found a scribe to write a letter to Hassan, which I sent to Beyrout, with orders for him to return and meet me at Tyre. I wrote in Arabic, not because he could read it, but so that if my messenger overtook him on the road he could get it read to him by a scribe in Sidon or elsewhere. This is the custom here. Then I boarded the ship again, roused our party, and having taken a cup of coffee of François's best sort, we went ashore in a body.

Our intention had somehow leaked out, though I had impressed secresy on my messenger to Beyrout. But he had a dragoman friend, and had whispered to him his chance for a bargain and he had not kept his secret. Accordingly, on our landing, we were beset by a dozen accomplished dragomans — ragged, dirty fellows, who could talk a little Lingua-Franca and ten words of English, every one of whom avowed his perfect ability to show us the wonders of Haifa and St. Jean d'Acre, and of all the world oriental that it should please us to visit.

One of them was a tall Syrian, whose voice was like the small end of a thunder-bolt caught among the bushes — a rugged rumbling voice which was frightfully ludicrous. I engaged him at once on the strength of his voice, and told him what I wanted. He was exactly the man for us. He had a brother at Tyre, who could accommodate us for the night. A capital house he had — it was clean, roomy, airy, and finely situated. He would get us horses — splendid animals — such as the Prophet of the accursed (our man was a Greek Christian) might have been proud to bestride. He would take us to Tyre like princes, and to Beyrout like sultans.

Bekam? insinuated John, in his mildest tone, overwhelmed at the prospect of so much state and splendour, and beginning to think it would cost a trifle to travel in this style.

"How much?"

For the sum of ten pounds Demetri the Syrian agreed to convey us — six to Tyre and four of us to Beyrout — in the style aforesaid, within two days, resting at Tyre for the night in the palace of his brother.

The horses of Haifa are not of the blood of the Prophet's mare. They are not of any blood at all. They are bones absolutely and wholly.

But bones or blood, the Syrian horses can go; and go they did with us across the plain and up the sea-coast towards the ancient city of Acre, which lies at the northern point of the bay, as Haifa lies at the south. The distance is about seven and a-half miles. Demetri led on at a rattling gallop. His voice came back to us once in a while as he chanted a song intended to be gay, but in reality most lugubriously solemn.

We paused at Acre, but I shall not stop to speak of it here. The city is like all oriental cities, and the ancient fortifications — half-repaired, but never able to recover from the terrible shattering they received from British cannon, in 1840 — lie in the sunshine in mournful weakness. We loitered here too long, so that evening came down on us before we reached Cape Blanco.

The road was various. Now we were going at an easy gallop across a plain, and now risking our necks in a narrow mountain pass that no human being ought to dream of riding through in daylight, much less by night, as we were now doing.

We crossed Cape Blanco, a mile or more of mountain climbing and descending, and then a better road brought us to the gate of Tyre.

And this is Tyre! There was a day when the world knew no such grandeur as was here. How are the mighty fallen! "Tyre shall be a place for fishers to spread their nets." "Was not that the prophecy?" said John.

And how fulfilled!

As we rode down the neck of land which connects what was once the island of Tyre with the main land, Demetri, rejoiced beyond measure at escaping from the Bedouins, whom his cowardly heart had been fearing every inch of the way, raised a loud cry, which, in his unearthly voice, sounded like an Indian war-whoop, and dashed down the road. We followed. He whooped and yelled, and shouted, and kicked his beast, and plunged on to the very gate of the city, when a pistol-shot, which John let off for the purpose of startling him, completely and totally dissolved his nervous strength, and the poor Syrian went like a dead man over his horse's head into a mud-hole directly in front of the gate of Tyre. The gates were shut.

When Demetri had picked himself up and ascertained to his satisfaction he was not shot, he began to shout in all sorts of gutturals to the guard within the gate, and at length induced the great door to swing on its hinges. As we entered, the porters, two surly soldiers, reached out their hands for a fee, and I had another chance to practice my stock of Arabic. *Bekam?*

We got off tolerably well for a few piastres, and then went on to the palace of Iskander, the brother of Demetri.

Yea, verily, the palace of Alexander the Great, in the city of Tyre, on the coast of Asia! For Alexander would weigh three hundred at least, and his palace — as for that, perhaps the least we can say is the best.

Nevertheless, let us contrast the ancient with the modern. Here, two thousand years ago, were splendid temples, shrines of magnificent adornment, houses whose ladies were wrapped in Tyrian purples that gave the very name of luxury to the vocabulary of the world. There was no city where men did more joyously exist, where women lived in more luxurious delights, where sweeter incense intoxicated the devotees of Bacchus, Venus, or Mercury. Marble flashed in the sunshine. The carved ornaments of a temple were worth the purchase of a kingdom. It was a trifle to Tyre that it gave Jerusalem the most costly parts of its great temple, and the king laughed at the paltry return of Solomon, who offered him cities and subjects! The whole territory of Tyre, in its greatest days, was never a thousand square miles, perhaps never four hundred; but the still sea, on a sunny afternoon, reflected in its calm surface magnificence and grandeur which had no superior, even to the Pillars of Hercules.

An old man, Ezekiel by name, borne on angel's hands, beheld a vision in the far future, and thus delivered the burden of his foresight: —

"Oh thou that art situate at the entry of the sea, which art a merchant of the people for many isles. Thus saith the Lord God. O

Tyrus, thou hast said, 'I am of perfect beauty.' Thy borders are in the midst of the seas, thy builders have perfected thy beauty. * * * Thy rowers have brought thee into great waters: the east wind hath broken thee in the midst of the seas. All that handle the oar, the mariners, and all the pilots of the sea, shall cause their voice to be heard against thee, and shall cry bitterly. And in their wailing they shall take up a lamentation for thee, and lament over thee, saying, What city is like Tyrus: like the destroyed in the midst of the sea? The merchants among the people shall hiss at thee; thou shalt be a terror, and never shall be any more."

Never was prophecy more literally and exactly fulfilled. Tyre is a terror. In the stormy nights of the Levant, the miserable mariner whose boat, with high lateen sail close-reefed, goes flying down the coast, prays God to keep him off the Isle of Sur, and save him from utter destruction on the ruins of the once mighty city! The water is filled with columns and architraves, and where of old the glory was reflected on the surface, now deep down in the still sea you may sometimes catch sight of the floors on which the princely once trod.

And modern Tyre we were in, and the house of Alexander was the successor of the palace of Hiram.

It was built of stone that may have been part of the palace of that king for aught I know. Possibly these walls had inclosed the ladies' owners of those days. But now a cold wind howled through their crevices, unstopped by the vain plastering of mud. Demetri was right. The house was airy; but it was engaged before our arrival. There were fifty — yes, seventy-five — yes, a hundred thousand fleas to every square yard of the mud floor; and as to the blankets he gave us to lie upon — the blankets were alive — they crawled — they positively moved with the indescribable crowds of inhabitants that filled its texture.

It was a night of horror! Before we slept, or attempted to sleep, we demanded food. Demetri gave us water for our hands before eating, reminding us of the ancient custom of pouring water on the hands, which they follow precisely now, as I have often seen. All the water is carried about these eastern cities in goatskins, which have been taken off nearly whole, sewed up, and in some way cured.

We washed and ate, and then we tried to sleep. D. T.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Despite the cheerless gloom and freezing cold of the evening of December 15th last, our brothers of the south held their usual meeting at the Lecture Hall, Carter Street, Walworth. The President being unavoidably absent, the chair was taken by W. Ackland, Esq., Vice-president.

The reading and confirming of the minutes over, several gentlemen were thanked for donations; among them Mr. Pouncy, who, at the Secretary's request, had generously forwarded three excellent specimens of carbon printing for the Society's folio [a landscape, a portrait, and a copy from some rare old print by Dr. Diamond].

A new stereoscope was exhibited by its inventor and patentee, Mr. Bincks. Its novelty consisted in the power it had of being, by a very simple arrangement, moved outward and forward, so as to suit all visions. Many, Mr. Bincks said, had seen stereoscopically with this who had never done so with any other instrument.

Mr. Alfred H. Wall was then called upon to read a paper announced under the title of *Practical Observation upon Photographs in their Relation to Art.* [See page 3.]

Loud expressions of applause greeted Mr. Wall upon the conclusion of his paper.

The Chairman was very glad to find a subject broached which would, he thought, call the attention of photographers to a matter of great importance. The mechanical had certainly taken undue precedence of the artistic, and we had thus given the opponents of photography a strong weapon against it. The pictorial was the most important and most neglected branch of our art, and he was pleased to find the fact asserted in their Secretary's excellent observations. With regard to white skies, he thought the worst thing about them was that they were by no means necessary, because if the negative had no sky we could obtain one by the printing.

A vote of thanks was awarded to Mr. Wall.

Mr. H. L. Keens rose to support one suggestion started by Mr. Wall, viz., that photography was not necessarily a mechanical art because it claimed many mechanical appliances. Michael Angelo might frequently have been seen from early morn till late in the evening with an apron tied round his waist, and his hands grasping mallet and chisel, cutting from the solid marble block some one of his mighty works, the perspiration streaming from his thoughtful brow the while. The modern sculptor says, "I cannot labour in that manner;" and consequently forms a model in clay, employs a workman to copy it in marble (which by mechanical aid he is able to do very correctly), and then himself adds the finishing touches. Now, if works thus produced are works of art, why may not photography claim the same appellation?

Mr. Hughes: The subject of art photography is one which justly claims serious thought, and Mr. Wall's paper will undoubtedly call the attention of members to a too-much neglected subject; but there are two sides to every question. In the first place, the mechanical and scientific branches of photography are in themselves so absorbing, and present so many and such great difficulties to our operators, that the artistic is necessarily lost sight of; and, in the second, it must be remembered that the art is now in its infancy, and that it has come into our hands not as children, but adults. Photography, like infant art, must first master the mechanical, and then turn to the study of higher effects. The mechanical branches, being acquired with so much ease, would be sure to claim the earliest attention, especially when they were so attractive as in this art; but the higher qualities would be equally sure to assert their supremacy in their own proper order.

Mr. G. W. Simpson: Acknowledging the difficulties of manipulation, he still thought with Mr. Wall that the absence of artistic culture had not its origin in any inability to spare time from the pursuits of photographic chemistry and optics (inasmuch as some of our most artistic photographers were also excellent chemists and opticians), but rather in the fact that photographers had no idea of the effect to be produced. Facility was the bane of the art; so many were content with its worst productions, who could not even conceive a necessity for the mere elementary requirements of art. He did not find either that those who knew little of art were, as a rule, any the better acquainted with science, or *vice versâ*. For his own part, he hoped to see a time when the most talented men of the day would be paid by the parent society to give courses of lectures upon art as connected with photography — such lectures as we found given at all other art societies.

Mr. Hughes: Photography has not yet reached that point, although it is probable that we may yet have a professorship of photography instituted in connection with even the Royal Academy. The Photographic Society is not an educational establishment.

Mr. Wall thought it was, and said: If the culture of art is to be continually deferred until those are prepared to study it who never evince the least inclination to do so, I fear photography will indeed lie long under the stigma of being a mere mechanical art.

Mr. Simpson: Ought not the knowledge of art and its mechanism to be pursued coincidently?

Mr. Keens: As they are by students of painting.

Mr. Howard: Much study had been directed to the least practical theories of photographic science which with greater advantage might have been devoted to the principles of art. It was as if an art-student went to work and compounded colours and made brushes all his life as only preliminary to his study of painting. In more immediate reference to Mr. Wall's remarks upon light and shade in landscapes, he had experienced that more of the picturesque and effective was lost by a fear of getting too much shadow than anything else. Most elementary works recommended the strong illumination of the subject, and introduced a fear of the sun getting into the lens, from which cause students frequently went to work with the light at their backs, and obtained the flat inartistic effects observable in the specimens Mr. Wall had introduced. He always worked, as the members would see by the specimens before them, with a side light.

Mr. Leake thought that, with reference to the artistic in portraiture, it should be remembered that photographers had not that choice of models, and that power of omitting details offensive in themselves, although not of importance to the likeness, which painters had. One lady, with heavenly aspirations apparent in her nose, would insist upon having her head very erect — or upon sitting in an awkward position, simply because Mr. Jones, her spouse, sat so when he was "taken off" — and her friend, Mr. Smith's limbs may be of that peculiarly ungovernable and eccentric description which will defy your most desperate efforts to place them in anything like a tolerably graceful, or rather not conspicuously awkward, position. Again, it is true that a head may be

lighted very artistically, and defects lost in skilfully contrived shadows — but then Mrs. Smith "can't bear them black shadows;" and Mr. Jones sternly inquires if his wife had got a smudgy or dirty face? — or what that black patch means under her chin? — or whether you mean to tell him, sir, that his wife is a nigger?

Mr. QUIN thought such objections more frequently arose from the fact of shadows wanting transparency, and so losing their real character, and held up one of the prints on the table as a specimen of shadow delicately relieved with reflected lights, in the manner pointed out by Mr. Wall.

Mr. WALL: The objections of uneducated sitters are as common to artists as to photographers, and, I think, arise from ignorance only.

Mr. HUGHES said the public were in a great measure the cause of the inartistic character of photographs — for instance, he knew a gentleman who failed to sell a batch of prints to the dealers because they had not the clean white paper skies, so strongly and justly denounced by Mr. Wall. We must not forget that the commercial view of this subject is an important one.

Several other gentlemen entered into the discussion, which grew very animated and interesting, and was occasionally amusingly relieved by the introduction of *apropos* anecdotes. The different agencies now at work for popularising art-education were pointed out, and some opinions expressed relative to the real amount of artistic excellence obtainable in regard to atmospheric effects, while the sensitive medium and optical appliances were in their present condition.

Mr. G. W. SIMPSON thought artists were to blame for neglecting photography, and allowing it to fall into unfit hands.

The VICE-PRESIDENT then announced that Messrs. MARTIN and KEENS would contribute a continuation of the

PHOTOGRAPHIC JOTTINGS,
No. 2.

The first of which was introduced by Mr. J. MARTIN, upon the value of a preparation called the *Crystal Enamel.*

There are few practical photographers who have gone through the process of toning, fixing, and washing a positive print on paper, who can have failed to observe the extreme brilliancy in the high lights and middle tints, and the beautiful transparency in the deeper shadows possessed by the picture while floating in the water employed for the removal of the hyposulphite of soda.

The mere allusion to this will, I am sure, be sufficient to awaken a recollection of the desire which all have entertained that the picture might be made to retain, or have imparted to it, the same amount of brilliancy when dried and mounted; this however it is hardly necessary for me to add has been found hitherto unattainable, if we except the simple coating with gelatine, adopted, I believe, principally by some French photographers.

It affords me much pleasure, therefore, to be able to bring under your notice this evening a preparation which has been in occasional use on the continent for some months, and is being now offered to English photographers by Messrs. Horne and Thornthwaite, of Newgate Street, under the name of *Crystal Enamel.*

I have therefore brought with me, and submit for your inspection six pairs of photographs, one set in the ordinary condition, and the other heated with the enamel; a comparative examination of which will, I am sure, abundantly demonstrate the power which this preparation possesses of imparting that liquid transparency which has so long been a desideratum.

So much for the *apparent* advantages resulting from the employment of this preparation; there is another, however, which is not so obvious at first sight, of even still greater importance.

The permanency of positive prints on paper is the one thing as yet unsecured to photographers, notwithstanding the elaborate researches and numerous experiments so carefully conducted with that object in view; and it is not unknown to those who have given attention to the subject, that this want of permanence is due in no small degree to the alternate and combined action of air and moisture upon the chemical constituents of the picture. Hence it follows that, if these can be protected from such adverse influences, the decomposition or fading will be arrested and permanency arrived at.

I do not mean, of course, roundly to assert that we have in this preparation the grand *panacea* for the great photographic evil; but to say that if it be admitted that a well-washed photographic print is permanent if it were not for its continued exposure to air and moisture—and if it be further admitted that resinous substances, such as are contained in this enamel, have the property of protecting delicate surfaces from the air—then it seems to me that we at least bring together the conditions calculated to ensure the desired permanence; but, whether we shall accomplish that end, of course, the lapse of time only can show.

I should be leaving my notice of this unique preparation incomplete if I did not describe the method of manipulation, which is simple in the extreme.

Having provided yourself with a bottle of the crystal enamel, it is only necessary to prepare one solution, which is done by dissolving (by the aid of heat) 10 grains of Swinborne's gelatine in one ounce of water. This is applied, while still warm, with a flat camel's hair brush over the whole surface of the photograph, including the card-board upon which it is mounted. This coating of size, if I may so term it, is allowed to set hard and dry; the picture is then either hot-pressed or burnished with an agate burnisher; a piece of cotton wool, compressed moderately tight to about the size of a walnut, is next nearly saturated with the crystal enamel, and in this condition is wrapped in a piece of clean calico rag, which is afterwards just lightly touched by the finger dipped in linseed oil: the whole is then gently rubbed, with a rather short circular motion, over the surface to be enamelled, and the application continued until the required brilliancy is obtained; lastly, finish by applying, in the same manner, alcohol and linseed oil.

The usual vote of thanks was awarded to Mr. Martin.

Mr. HOWARD stated that he had prints varnished, or rather polished, in the manner described, which, at the expiration of two years, were in a perfect state of preservation.

Mr. SIMPSON referred to the fact of all varnishes becoming discoloured by time.

Mr. HOWARD found those he alluded to remained perfectly colourless, and that they bore usage remarkably well. They were of French manufacture.

Mr. WALL thought the high polish objectionable, but considered permanence and the increase of detail in, and consequent transparency of, the shadows fully compensated for what, in small pictures, was a very trifling defect.

Mr. H. L. KEENS then contributed a jotting (No. 3) upon

The Proportions found in Figures produced by Art and Photography.

The relative proportions of the human figure are of the highest importance in Art, and in portraiture the peculiar proportions of the individual represented are as necessary to constitute a perfect picture as a correct delineation of the features of the face, and whenever artists have transgressed this principle it has invariably exposed them to the merited censure of the critic.

Gerald Laïsse carefully measured the best proportioned persons, and gives it as a rule that the height of the male figure is seven heads and a half that of the female eight heads. Du Fresnoy says, eight heads are ten faces. Bonomi has published a curious and interesting diagram, used by the celebrated sculptor Gibson, which gives a certain length produced from that of the head occurring three times in the same figure, and another length occurring five times in the same figure, and which correspond to eight heads, as also to ten faces. (Diagrams were submitted.]

It will be perceived that when the figure rests on one foot, according to our general mode (stand at ease as it is termed), the height of the figure is somewhat reduced in consequence of the bending outward of the hip joint and the consequent curvature of the spine. To illustrate this by photography we have but to cast a glance to some fine specimens of whole length portraits which we are able to produce through the kindness of Mr. La Roch, Mr. Barnes, and Mr. Quin; yet it must be remembered that we seldom find persons whose proportions come up to the adopted standard, and in old age the spine becomes more curved and the knees bend forward, shortening the figure considerably.

A good photograph will give a faithful representation of the subject with due proportions. Should an operator therefore be doubtful of the correctness of his apparatus, let him measure out carefully the proportions of a living model, and examine if his photographic image produces the same result.

In the diagram of Bonmi it will be observed that the head is divided into four portions, three equal ones, thus:—first, from the bottom of the chin to the bottom of the nose; secondly, from the bottom of the nose to the indentation a little below the brow, thence to the root of the hair on the forehead; the remaining portion to the top of the head is somewhat less, so that eight heads become precisely equal to ten faces. This is also illustrated by photographic portraits, having a diagram drawn upon them, now before you.

Serious mistakes have been made with regard to the proportions of children; frequently they appear like little men and women. In

infancy the length of the head is one fourth of the entire figure, and as it advances in life the head gradually becomes less in proportion, until at maturity the head is but one-eighth of the whole length. Hence, in consequence, the shoulders of the child appear small. This is illustrated by various engravings after Raphael, Murillo, Correggio, Sir Thomas Lawrence, &c., as well as by photographs of children. [These were produced.]

It has been frequently suggested that the hands are too large in a photographic portrait; this arises from the hands having been generally represented small, but Sir Joshua Reynolds, in his notes on Du Fresnoy, states that the hand is the same length as the face, and the thumb the same length as the nose; these proportions may be seen in engravings after Vandyck and others, and on photographic portraits. [Also produced.] It has also been stated that the mouth is enlarged and the eyes appear too small: with regard to the former much depends on the arrangement of light upon the model. If the shadows are too dark, that which arises from the muscles (the depressors of the angles of the mouth), will appear united to the line of the mouth itself, and produce the effect of a mouth too large. With regard to the eyes, care should be taken that the sitter remain some minutes in the strong light of the operating room before the portrait is taken, particularly when the eyes are delicate, for we naturally close our eyes in a strong light. It is thought that the nose is generally too large, particularly towards the end: this arises also from the illuminating, for if the high light is too broad it will necessarily produce that appearance. The photographs here produced are very perfect, in some the high light on the nose is as delicate as in the fine miniatures by Sir Wm. Ross. With such photographs as these (by Messrs. La Roche, Cotton and Wall, Barnes, and Quin), the public will not find fault, nor think them *too* truthful. The operator will find sufficient to delight him when by his art he approaches the beauties of nature, and will then admire our Sir Joshua, Sir Thomas, Wilkie, and others deceased, and our present Landseer, Frith, and others living, who have not forsaken nature for the phantoms of fancy.

A vote of thanks was awarded to Mr. H. L. Keens.

A number of fine photographs, engravings from celebrated paintings and drawings, were produced in proof of the assertions contained in this paper. Several whole-length photographic portraits were placed beside the measurements given for drawing the figure and found to bear the test, and to have the same relative proportions in every part, in common with good paintings and prints. Among these specimens were a set of very artistically beautiful theatrical portraits, by La Roche, which were very much admired.

Mr. Simpson took up a singularly perfect photograph of a most beautiful young lady, and placing it beside an engraving from the painting of Rembrandt's wife, asked which was the more artistic or beautiful production?—(A general laugh.)

Mr. Quin said the delightful picture in Mr. Simpson's hand, produced by a Dublin photographer, would forcibly illustrate a remark made by Mr. Wall, viz., that but little direct light was needed to produce a properly illumined portrait; for this lady had been taken in a glass room at the bottom of a deep well of enclosing houses.

Some photographs were also produced, taken at Mr. Keens' request by Mr. Quin, from a figure chalked on a wall, being six feet by one foot in height and breadth, and divided into six divisions of one square foot each.

Mr. Quin said, when Mr. Keens proposed the matter he had been inclined to shirk it, fearing to expose a weak point in photography. The diagrams were taken with a whole-plate Ross's portrait lens, three and a quarter inches in diameter, using the full aperture, six inches, and taking the figure six inches in length. He found that no distortion took place; and on taking it again eight inches in length, he was astonished to find that still no distortion was produced. The first diagram was taken from the exact centre of the figure, the camera being perfectly level. The second was pointed at the square below the highest, and inclined (this is the general mode adopted by many photographers when taking standing figures), and the result was, as you see, a general distortion of the whole, none of the squares being equal in length or breadth, and the whole figure being much narrower at the bottom than at the top. Of course, having used the full aperture of the lens, the lines are in parts necessarily out of focus.

Several gentlemen were desirous of making remarks upon Mr. Quin's communication, but, in consequence of the late hour, all discussion upon this and Mr. Keens' paper was postponed until the next meeting, which will take place on the 19th inst.

A paper, by Mr. Leake, jun., on *Failures in the Wet Process: their Cause and Cure*, was announced for the next meeting.

The Vice-President informed the meeting that a sub-committee had been appointed to choose the presentation photograph, which, he hoped, would do justice to the artistic taste and photographic judgment of the gentlemen appointed to select it, and give pleasure and satisfaction to the members. He also announced, by desire of the committee, that all members of provincial photographic societies visiting London would be gladly welcomed to these meetings. He had *personally* received great kindness from many of our provincial brethren at *their* meetings, and, for his own part, should be glad to pay back the obligation in kind. (Applause.) The presentation photograph would, he hoped, be placed on the table at the next meeting, though the copies could not, of course, be ready for circulation for some little time.

Several papers were promised for future meetings, upon the chemistry, optics, mechanics, and pictorial elements of photography.

The Rev. J. Thompson Smith, B.C.L., was duly elected.

The meeting then adjourned.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

A meeting of the above society was held at the Golf Club House on Monday, the 19th ult. The President, J. Glaisher, F.R.S., was in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. Heisch called the attention of members to the great intensity produced by the use of salts of magnesium as iodisers for collodion, and exhibited some negatives, showing the effect of different iodisers on the same collodion. He stated his belief that salts of magnesium would be principally useful in copying prints and such subjects as required decided blacks and whites, but would give too great intensity to produce good effects in an ordinary landscape collodion.

Mr. Melhuish exhibited a stereoscopic camera in brass, electroplated, which combined the qualities of lightness and compactness; the dark slides, seven in number, with focussing glass, packing inside the camera, which was fitted into a leather case.

Mr. R. P. Napper was elected a member of the Society.

After a vote of thanks to the chairman, the meeting adjourned.

LIVERPOOL PHOTOGRAPHIC CLUB.

In consequence of the lamented demise of Mrs. Keith having occurred so recently, it was not possible to continue the ordinary meetings at Mr. Keith's rooms, as heretofore. The usual meeting for the month was accordingly held at Mr. Corey's house, to consider the present prospect of the society, and to debate upon the proceedings for the future.

After considerable deliberation amongst the more influential of the members, it was determined to hold the *seances* of the Club at the respective houses of the members present, in rotation, and to reckon the present as the first of the series.

Mr. Corey took occasion to remark upon the obligation amateurs owed to the writer of the amusing and compendious letters to Eusebius. All of them had been clear, succinct, and eminently practical, but the later letters had done great service to the art. He alluded to the subject of "waxed-paper." Enthusiastic and impatient operators fondly believed there was a royal road to success; and, to save their labour, complicated their solutions with a long list of chemicals. Disappointment made them vary their salts with the like want of success, being all the time unaware that the great requisites were, extreme care in manipulation and less reliance on the susceptibilities of the excited surface, than when collodion was employed. This the writer of the letters had most ably expatiated upon; and so impressed was he (Mr. C.) with the importance of these hitherto disregarded directions — confirmed as he was in this faith by having seen Mr. Keith, when at Furness Abbey, expose fresh plates, with no preservative upon them, for so long as fifteen minutes — that unfavourable as this season must be acknowledged to have been, he selected a piece of paper that had been iodised so long back that the formula for its preparation was a matter of doubt — excited with old aceto-nitrate, black with use and age, taking only the precaution to add fresh glacial acetic acid; and with a prolonged exposure in what was so good a light that he previously would have deemed four minutes sufficient but in this case fifteen minutes, and subsequent patient development with the weak solution of gallic acid, judiciously recommended in the letters — he obtained so good a negative, that it was a matter of regret that the subject had not been more worthy of the pains. He now considered the thanks of the readers were due to the author of the letters to the contumacious and thankless Eusebius, as well as regret at the long journey he appeared to contemplate.

The Messrs. COOK BROTHERS, who are by far the most successful adepts of the Society in this branch, stated that they were fully prepared to bear out the testimony of the writer of the letters, that provided some organic matter, such as sugar of milk, and especially serum, were introduced, the choice of the preparing salt was of little importance.

Mr. COREY objected to the indefinite mode of speaking of serum without giving plain directions for its preparation. Rennet was not always easy to obtain, and was mostly salted, thus containing chloride of sodium, and, as a substitute, acetic acid was too often employed, thus producing decomposition — in the case of iodide of potassium causing a change to acetate of potassa, a non-photographic salt, with a liberation of free iodine, a known retarder of sensibility.

The Messrs. COOK gave in their report of the papers submitted to them at a former meeting. That furnished by Mr. Keith from the mills of Messrs. Pirie presented no albumenised surface though the albumen had been laid twice on each paper, whilst that brought by Mr. Corey from Messrs. Hollingworth's had a very glossy and effective appearance.

Mr. BELL stated he had found a new preservative fluid for collodionised plate in the wine of Champagne. Having occasion to experiment upon this wine in order to see if the saccharine matter it contains could be detected in the microscope to crystallise, he discovered that after four days' exposure to air it was entirely unaltered. The applicability of this to sensitised surfaces of silver salt at once struck him, and he had experimented with signal success. He only waited for finer weather to pursue his research with this stylish medium.*

The next meeting, to take place in a month's time, was arranged to be held at the house of Dr. Cauty.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of the above society was held at the Chorlton Town Hall on the 14th ult. Mr. NICHOLSON, Vice-President, occupied the chair.

After the minutes of the last meeting were read and confirmed,

Mr. GREEN said he should like to ask the meeting if any gentleman had tried the copying by gaslight explained by Mr. Lloyd at the last meeting.

Mr. FAWCETT said he had successfully used Mr. Lloyd's application, and could copy in about seven minutes. He liked the application very much. Whilst speaking of copying and gaslight he should be glad to enquire from the members if any gentleman was employing gaslight for enlarging photographs, as he should be glad to know the best method of enlarging so as to retain the sharp and clear definition of a direct photograph.

Mr. GRIFFITHS said he was satisfied of the correctness of the enlarging process, and had given up working large negatives from nature. He had discarded all his cameras except one, 1-8th size, which took negatives two inches by two and a half. He magnified them at his convenience to the size required by taking a level smooth board three feet long, and fastened at one end a half-size camera with an achromatic plano-convex lens reversed; at the other end he placed a quarter-size camera with the lenses facing each other. The small camera was packed so that the lenses were all centre to centre. A very important matter was to get the diaphragms in the right position: to accomplish this the front lens of the half-size camera was removed and a stop of three-eighths of an inch inserted in the cell to obtain a true centre to the lenses, afterwards the lens was reinserted; a second diaphragm, one inch aperture, was then placed in the ordinary way between the lenses in the quarter-plate camera to cut off spherical aberration, or the edges would be out of focus. To work an enlarged picture he placed a small negative, which he found best from wet collodion, in the plate-holder with the collodion side next the lens in the quarter-plate camera, making it secure so that the shutter could be opened without disturbing it, and also so that no light could pass except what passed through the negative. He had not tried gas for the light, but placed the camera facing the sky so that a clear horizon was before the picture. Should it be placed opposite houses or trees the light would be imperfect in that part, and give a corresponding result, of course. The small camera containing the negative to be enlarged was placed to the light; the exposure was from one and a half to six minutes with his lens, but varied with density of negative and strength of light. He promised to bring some specimens to the next meeting, and regretted that he was not aware that the subject would be brought before them, as it was full of interest to him. He would only further remark, that he could not magnify a collodion-albumenised negative to his mind: the deposit of silver was so great that it magnified with the negative.

After some other remarks from other members,

Mr. HOOPER stated that he should be glad at the next meeting to lay before them a paper process which he thought would be interesting.

After a vote of thanks to the chairman, the meeting adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE monthly meeting of this Society was held on the evening of Tuesday, the 13th ultimo. Mr. SCOTT ELLIOT occupied the chair.

Dr. Simpson, H.M.I.S., Mr. A. Falkener, Sheriff Hallard, Rev. Dr. Hodson, Mr. D. C. Connell, Mr. R. Pope, and Mr. James Kirk, were elected ordinary members.

The SECRETARY read a communication from Mr. John Sang, Kirkaldy, *On Photographic Printing Frames*, illustrated by specimens of different forms.

A short communication was then read, from Dr. Simpson, on

An Easy Method of Recovering the Silver from Waste Nitrate Baths.

The plan he proposed, and which he had followed for some time, consisted in converting the silver into an oxide, by the process discovered and published by the late Dr. Gregory. This is done by the following means: — Common salt is added to the nitrate of silver solution until it is all precipitated as chloride. The chloride is thoroughly washed by decantation with hot water, and covered, to the depth of half-an-inch, with a solution of caustic potash of the specific gravity of 1·25 to 1·3. Care must be taken to break down all lumps or hard masses with a platinum spatula. The whole must be boiled for ten minutes, or until the chloride has been converted into a heavy jet black powder. If any white specks are observed, the mixture may be rubbed in a mortar, and once more boiled for a short time. When the decomposition appears complete the oxide is to be carefully washed by decantation with hot water until all the saline matter is removed. This oxide dissolves completely and easily in nitric acid, forming a colourless solution of pure nitrate of silver.

Mr. J. T. TAYLOR said he had on several occasions made oxide of silver by Professor Gregory's process as now detailed to them, and could bear testimony to the excellence of the plan, but he thought it involved too many manipulations to find favour with the majority of practical photographers. For some time back he had adopted the much simpler process of precipitating the silver in a *metallic* form, by the addition of a few pieces of copper to the impure nitrate of silver solution. This at once deposited the pure silver in the bottom of the dish, leaving nitrate of copper in solution. After careful washing of the precipitate it might either be at once dissolved in nitric acid, forming pure nitrate of silver, or melted in bars.

On the proposal of Sheriff Cay,

Mr. TAYLOR illustrated his remarks by precipitating the silver from a tumbler of nitrate solution which had been procured. This he did by the addition of two or three penny pieces, which, in a few minutes, effected the desired precipitate. He concluded by remarking that, not only was this method useful in photography, but he found it one of the best and simplest methods for obtaining absolutely pure silver in his own profession.

The attendance was not very numerous, and the business was concluded before nine o'clock.

CALEDONIAN PHOTOGRAPHIC CLUB.

THIS club met in Edinburgh on the evening of Saturday, the 24th ult. Mr. BROWN was called to preside. The minutes of former meeting having been read, the Chairman said:—I see from the programme of to-night's proceedings that our excellent friend Mr. Williams is to address us; but you must pardon me delaying calling on him for a few minutes till I advert to a circumstance which has taken place since our last meeting—I allude to the death of Professor George Wilson, one with whom many of us were intimately acquainted, and all loved dearly. Those of our club who were privileged to associate with him, whether in the capacity of friends or pupils, will not readily forget his profound scientific attainments or endearing kindliness of character. His photographic researches were of an interesting kind, and directed to the higher walks of our art. Fluorescence and its varied phenomena were much studied by him, and it is possible that, had he lived, he would ere long have benefitted the scientific world by his experience of this highly interest-

* Our photographers are becoming perfect epicures; for at a late meeting Mr. Forrest recommended Constantia for the like purpose.

ing and important topic. He was an humble and devoted Christian, and always moved among us as in daily expectation of death. His warning to depart was short. On Friday some of us heard him lecture as usual; on the following Tuesday his noble soul had forsaken his feeble body. His loss is a public one. All Scotland mourns for him. Mr. Williams will now address us, and if I may judge by the various articles before him on the table, I should venture to say he will be very practical indeed in his remarks.

Mr. WILLIAMS: Gentlemen,—My subject to-night, as intimated at our last meeting, is

On Transferring Collodion Positives from Glass to Leather, Cloth, &c.

At our last meeting Mr. M'Naughton hinted his preference for a free and easy style of discussion at our meetings. Presuming that a similar style might be preferred in my treatment of the subject before me, the more especially as this is Christmas eve, when we are all naturally anxious to get back to our friends as soon as possible, I will spare you the infliction of a paper and merely demonstrate the process in question. Here are, you observe, a few sheets of soft leather, coated on one side with a black shining varnish, and here are also a few pieces of cloth, apparently linen, varnished in a similar way. This latter I purchased from a trimming shop in town on my way to this meeting. It is now somewhat extensively manufactured for this purpose. Here again are a few positive collodion pictures; some of them a few years, others not a few hours old. None of them have been varnished. This bottle contains what I call my transfer-varnish, although in reality it is not varnish at all. It is common methylated spirits of wine with a few drops of nitric acid added to each ounce. The quantity in this is in the proportion of seven or eight drops to each ounce of the spirit. Having cut all the cloths to the proper sizes, I now pour over each plate a little of the acidulated spirit, sufficient to moisten it thoroughly, and rear them all on end to drip. I wet the glazed surface of the cloth in a similar manner. Laying the plates down flat—picture up—I now gently, and without disturbing the film, cover each over with the piece of moistened cloth or leather. You will observe I now rub each one firmly from the centre to the edge, in order to press out air-bubbles, and conclude this part of it by placing them all between the leaves of this old scrap-book, and covering all with this weight to keep them in close contact. These should remain together as long as possible: not under ten minutes. For a valuable picture, I would consider half an hour quite short enough. When putting them aside, I see I have forgotten one, and, while the others are drying, I will make this one the subject of an experiment. I cover the back of the cloth with another piece of glass the same size as the glass picture, and clamp them together with these American clips. This will ensure contact. I now heat it before the fire, and, after a minute, remove the back glass. A further exposure to the fire renders it quite dry enough to attempt the removal of the picture. This I do by starting the collodion at the upper end, and, laying hold of the cloth by the corner, I lift it gently. There! You see the transfer is effected at once, and very successfully too, although done in much too hurried a manner. You will observe, too, that the picture is much more brilliant now than when it adhered to the glass. The glass itself is now ready for another picture. In the time you are examining this portfolio of transferred pictures, all done (with the exception of the hurried drying) in exactly the same manner as this, I will examine the others and see if they are getting ready. [The contents of Mr. Williams's portfolio were here handed round among the members, and were very much admired. The pictures included all kinds—plain and stereoscopic, portraits and views. In answer to a question Mr. Williams said he got as much cloth for fourpence as answered for four or five stereoscopic pictures.] He then resumed:—I find the pictures dry enough, and will now attempt their removal. I do this in exactly a similar way as I did the other. If a *stick* occurs in raising the film, I drop a little distilled water, which permeates between the glass-plate and the collodion film, assisting the raising of the film. Thus have I successfully transferred these ten pictures; and in sitting down, I thank you all for your patient hearing, and if in any way I can throw more light on the subject, I will esteem it a favour if any gentleman will ask any questions relative to this subject.

Mr. M'ADAM said: This is a subject which admits of no discussion whatever; its many advantages cannot possibly be doubted. I should like to inquire, however, who is the discoverer of this useful little piece of manipulation?

Mr. M'NAB: In absence of data to determine this question, I can only say that there will be no difficulty in getting at least half a score claimants for the honour of the discovery of this simple little piece of manipulation; as every one acquainted with the history of photography knows that no sooner has there been any discovery made, than some hungry cormorant, a claimant for fame and immortality, is always ready to pounce upon and seize the prize from its lawful owner.

Mr. BROWN: That beautiful uranium print of the lady of our esteemed host, which I see hanging over the mantlepiece, suggests a number of instances corroborative of Mr. M'Nab's statement. Although it is notorious to all who have been at the trouble to enquire, that Mr. Burnett, of this city (whom I hope to introduce as a visitor at our next meeting), is the real and sole discoverer of the uranium process, yet will it be believed that, at so recent a period as the late meeting of the British Association in Aberdeen, a French Abbé had the effrontery to stigmatise Mr. Burnett as a pirate and Nièpce de St. Victor as the discoverer of this process! This arrogance, ignorance, or something worse, was intensified (to use a photographic phrase) by the fact of the learned (?) body allowing the imputation to pass unquestioned or unnoticed.

CHAIRMAN: Before separating, I would call the members' attention to the splendid exhibition, now open, under the auspicies of the Photographic Society of Scotland. For neat manipulation, artistic selection of subject—in fact, for general excellence—the works displayed far surpass anything I have yet seen either here or in London.

Mr. MONTAIGNE: This is a subject, Mr. Chairman, which admits of two opinions. I at once admit that there are pictures in this exhibition equal to anything hitherto produced. The *general* excellence of the exhibition I do not so much question; but many exhibitors, as well as the public, will at once see that merit or excellence does not always occupy the "line." There is, for instance, a constructed group (representing a well-known clergyman and his *session*) of very great merit, which has its location in such a position as to necessitate absolute kneeling in order to see it; while on the other hand, situated in the *very best* position in the room, is a portrait of very large size, purporting to be a pure photograph by an American artist. Now, any one without glasses would see at once that pigments and camel's hair, rather than chemistry, have been employed in its production. The members of that society should really present their hanging committee with magnifying glasses.

Mr. BROWN admitted that he had heard many complaints, both loud and deep, relative to alleged undue favour in the hanging of some of the works. However, that might be want of *discrimination*. This appeared to him the only alternative to escape from such a charge.

The meeting separated at nine o'clock.

Exhibition.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

I HAVE again made it convenient to "conjoin business with pleasure," and send you some notes regarding the progress of our northern friends in the beautiful and useful Art of Photography.

The Exhibition was opened on the 16th ult., as I am informed by the *Mercury* of the 17th, which gives a brief account of the private view of the evening previous, and, after giving the names of the grandees who were present, winds up the peroration by stating that "Carlow, Cobalt, and Madder" had *sent* (!) some fine specimens from Kensington Museum. Being tolerably familiar with the names of the great majority of photographic artists, on entering the exhibition room, which is the same as last year (90, George Street), I wended my way on a voyage of discovery to find out the productions of these gentlemen, when, lo and behold! matters turned out as I had anticipated; these were the *modes of production* and not the names of artists at all.

There were four proofs—two in carbon, a portrait and landscape, the finest that I have yet seen produced by this process: in both the detail and half-tone are excellent, but the whites and sky are a dull cold grey, yet very superior to the copy exhibited by Mr. Pouncy the previous year. The cobalt one is a small portrait, two inches by one, with a warm tint of variegated blue, and the madder (crimson red), a portrait of a lady, about an inch square, giving a curious but pleasing effect. With regard to their permanency I can say nothing; but your able chemical correspondent, Mr. C. J. Burnett, will probably be able to inform you on that matter.

The most peculiar and prominent picture in the Exhibition is a panoramic view of Lucknow, in six divisions. The respective sections are not harmoniously toned, but it is bold, clear, and well-defined, giving a very accurate realisation of that great and wonderful city. There are in all nine hundred and twenty separate

views, counting the stereoscopic frames as one only. Five hundred and sixty-five of these are of Scottish origin; the remaining three hundred and fifty-five are from either foreign artists or sent from foreign climes—a large number being from India. Several artists have deluged the rooms with a plethora of specimens. The Messrs. Hay, for instance, send forty-five; Messrs. Cramb, of Dundee, thirty-five; Mr. M'Craw, thirty-five; Miss Taylor, twenty-nine; Mr. Wilson, of Aberdeen, thirty-one; Mr. Scott Eliot (amateur), thirty-one; Mr. M'Leay, twenty-six; Mr. Horatio Ross (amateur), twenty-four; Messrs. Maull and Polyblank, twenty-five, &c. I understood that, in consequence of the same thing occurring the previous year, a bye-law had been recommended or introduced by some member of the Society, to the effect that none were to exceed twenty specimens in one year, which is certainly an abundant limit, and only fair-play, to allow all to have their pictures exhibited. An intelligent dealer informed me that the Society had more pictures sent them than they could conveniently exhibit. The hanging committee, however, dont seem to discard proofs because they are of humble pretensions, of which No. 209 is an example. The catalogue states it to be the portrait of a gentleman, but who looks very like a condemned felon, seated solitarily in his cell, leaning his back against a perpendicular panel of timber, with one leg over the other, looking very sorry for himself — the foreground being very like a portion of a river or sea-beach, terribly out of focus. There are a few more pictures of the same character. I am persuaded had these been the product of some poor professional, instead of an office-bearer, they would certainly have been turned to the door and quietly disposed of.

Another amateur office-bearer has gone all the way to Venice to invest his nitrate of silver in a few blurred, ill-focussed pictures of that palatial city, and, while packing up his other photographic traps, had evidently forgotten his spirit-level. Architecture seems to have been in a merry mood when this gentleman planted his camera amidst that city of the sea, and disposed to dance a jig; for the perpendiculars of the buildings are nowhere. I allude especially to No. 126. *A Canal in Venice*—a picture awfully blurred and worthless—(No. 128), is equally poor, the camera having been tilted to embrace the field, clearly indicating, by the curved marginal lines, that it was not taken by one of the new lenses so bepraised by the committee of the Photographic Society of Scotland. Nevertheless this illustrates the charm and fascinating power this science has over its devotees, when gentlemen are impelled by it to make long, troublesome, and expensive journeys, to procure for themselves what they could purchase at home for a few shillings, infinitely superior proofs, and taken by *artists* on the spot. I hope this indefatigable photo' will be more successful on some future occasion.

I must try to mix a little sweet with the bitter, and give you an account of some things that are better; but knowing, as I do, your reverence for truth, and the rigid, inflexible way in which you fearlessly state your opinions in your criticisms upon the photographic art, I deemed it best to endeavour to give an accurate view of the *tout ensemble*.

In this year's Exhibition there are some very large portraits — that is, *enlarged* and coloured, as well as plain; but in these I find no appearance of progress. No. 269 is one by Mr. Brady, an artist of New York, in which the face is entirely stippled over, and which would require a couple of days hard artistic labour with the pencil. This picture is hung as an untouched photograph, which it is *not;* and, if I remember right, by one of the regulations of the Exhibition, promulgated by advertisement in the now British Journal of Photography was, that all such productions were to be labelled as *touched* or *painted pictures*.

Such being the case, this picture, according to the Council's own rules, ought to have been rejected and allowed no place on their walls.

Messrs. Lyndon Smith and Raven, who took the medals last year, are large contributors; and Mr. Smith has not only doubled his diligence, but also the number and size of his pictures and lens. He sends nine large landscapes, mostly from the sombre, gloomy, misty region, entitled the "Valley of Desolation."—Mr. Raven contributes twenty-two subjects, but I do not think any of these show any marks of progress; but no wonder, for, as he is doubtless carried by the same zeal and devotion to the discharge of his parochial and clerical duties, little time will be left to prosecute the science of photography. — Mr. Wilson, of Aberdeen, sends some thirty exquisite landscapes, and one frame of stereoscopic views which surpass in beauty and definition all the photographs that have been publicly exhibited in Britain hitherto; but, as you have noticed these so recently yourself, I shall pass them over. — Mr. Rodger, of St. Andrew's, contributes twenty-four, principally portraits, of rare excellence and beauty. One of these is an artistic family group, consisting of twelve, all beautifully delicate, and in good focus, with one tiny exception — a little boy in the foreground has moved, and has three eyes and partially two heads — otherwise it is a perfect gem, and I am much mistaken if the Society's medal will this year be awarded to misty, woolly, waxed-paper pictures.

I have not time for further remarks at present, but will probably communicate with you again in a few days, more in detail.

SEL D'OR.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VI. *(Continued).*

THE MOUTH

Next claims our attention. Before touching this most important feature, carefully study its formation and the various half and intermediate tints, which, betraying *the exact degree* of muscular action, rule the expression. Then, with the same tender care as before, begin with the upper lip, preserving its exact tone and shape, but strengthening the delicate reflected lights which play in soft minute touches about the centre of the shadowed half of the upper lip, near the corners, and parallel with the line dividing it from the lower lips, and give delicacy, roundness, transparency, and truth of texture. The lightest portion of the lips, when compressed, will be found near the centre, because the muscles then draw them inward from the light as they approach the corners. The amount of projection in the lips will be indicated by a soft shadow* cast by the upper one upon the lower, and by a strong or faint light upon the latter; it is therefore important to preserve the exact relative depth of the shadows here, as a want of this care endangers the likeness. The upper lip is always, more or less, in shadow. A delicate reflected light will be found tracing the outline of the lip, faintly or strongly, according to its peculiar form. Remember the remarks made upon the treatment of polished bodies in photographs, and lower the large light upon the lower lips to receive a smaller high† light of exactly the same shape, which may either be left out or touched in with a little Chinese white.‡ Of course this light will, by its form and brilliancy, indicate the lips' true contour and prominence. The hollow (which indicates a smile), at the corners of the mouth will give a shadow on the light, and receive a faint soft light on the shadowed side. The strength of the shadow cast by the lower lip indicates its fulness, and, less distinctly, its shape. The darkest portion of the lips melt imperceptibly into the general shadow on that side.

HAIR, EYE-BROWS, AND BEARD.

In beginning any part of your picture always consider its nature and effects. Hair is the most glossy when smooth, and very much less so when rough; the high lights will (by their degree of brilliancy), therefore go far to indicate this point. Don't let it appear as if newly greased and combed. Preserve the character of the photograph in the larger divisions of the hair, and its high lights, shadows, and reflected lights, but never attempt to individualise particular hairs by putting in a series of fine lines, as many painters do. All effect, and all the charms of this really beautiful subject, will otherwise be destroyed. (My aim is not elegant composition but effective teaching, therefore I again repeat my frequent caution, viz., do not let your lines be hard, and do not attempt to put any of them in with one stroke of the brush, or at any rate, *not yet.*) Remember that hair partakes of the nature of polished bodies. Soften the outline of the hair into the background, but do not give it a softness foreign to nature (nor make it woolly) in the attempt. A flowing grace should characterise its masses, and a vigorous marking of its high lights and deep shadows give additional softness (by contrast) to the rounded semi-transparent contours of the features. But again, with vigour it must not acquire a character of solidity, as if nothing less than a tempest blast could raise it, but while as hair it must be light as a polished surface, it must have strong shining lights and intense darks, and as

* The shadow cast by projecting bodies.

† Highest or brightest lights — those nearest the illuminating source.

‡ Be sure that this pigment is pure as otherwise it will darken, or blacken, and destroy your picture. Many Chinese whites (so-called) prove to be no better or more permanent than the common flake. If I was addressing a pupil in person, I should not hesitate to inform him where I procured the best water colours, and in despite of fearful delicacy, I will here state that my first and only master, the late highly respected and deeply regretted, Mr. Charles Foster (one of the best of a now decaying school of miniature painters, and a clever artist to boot), recommended me to purchase Newman's colours, which I have ever since used, and have never found surpassed. The fact is of sufficient importance to the amateur to justify this notice, although I may risk unpleasant comment by so doing.

a transparent mass it must possess extreme softness. Every lock should be traceable to its root. I have given you a difficult task, and one which very few master, for hair is indeed one of the most difficult things to paint well.

The Beard or Moustache.—The latter will be lightest, being the most prominent; preserve the transparent character it has where thin, and remember that it can never (naturally), be quite as dark as the hair, for not being so thick, it is consequently modified by the skin being seen through.

The Eye-brows must be put in with a touch suggestive of its smooth and silky, or rough and irregular character, &c. Its darkest portion will be found nearest the nose. Do not destroy the faint or strong shadow observable beneath it, neither in shape or tone.

The author of the preceding paper has, in order, to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students, in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq. 11, The Terrace, Walworth.

G. A. Hill.—See maxims 2, 4, and 5. Print on salted paper, roughen with very fine pumice stone, and proceed as usual, using the soft Swiss crayons. I shall include a short lesson on this subject. See a small work by H. Murray, published by Windsor and Newton.

J. D.—It is not often prepared by colour makers: I procure it from Newman's. See note to the present portion.

A Lady Amateur.—I perceive you are in earnest, and reveal great promise. Place the next between two pieces of millboard; this was damaged (as you have seen) in coming through the post. "So far so good."

One of my Old Pupils.—You have given me something to be proud of. I put your note in lavender.

Cornish.—Did we not draw together at the School of Design? If so, come and see me, or send your address. With regard to the positive—the likeness is evidently destroyed. Use more care and less colour; the carnations are too raw, and the blues too pure. Give up dry colours, and take to oil or water.

G. B.—The new French vehicle was recommended for another purpose to Mr. Daintree; but by substituting white for yellow wax and using more turpentine, it may answer yours. It dries very hard indeed, and, it is said, rapidly; but I have not tried it. When dry, it will bear any amount of friction. The water-glass is better in theory than practice, being destructive of very many important colours.

J. P.—Not for an instant. The fault is in the picture, which is so faint that you could not avoid effacing it with colour. Choose a vigorous, well-marked positive, especially when you finish highly. Varnish is a great advantage to powder colours, giving them transparency, mellowness, and permanence. It is a mistake to leave them unprotected. With regard to your concluding remarks, I hope to say something on the subject in another form some day.

Foreign Correspondence.

Paris, December 26, 1859.

Messrs. Maskelyne, Hardwich, Hadow, and Llewellyn's theory of the nature of the photographic image produced by the salts of silver does not meet with a ready acceptation by our French *savans.* The report presented to the Meeting of the British Association at Aberdeen does not appear remarkable for clearness. The point at issue between these gentlemen and Messrs. Davanne and Girard, the French chemists, who have most elaborately studied the question, appears to be this—whether the silver, after light has acted upon it, is in the state of sub-chloride, or in the metallic state. The French chemists incline to the latter view; the English to the former. Messrs. Davanne and Girard having published the details of the experiments whereby they arrived at their conclusions, we are better enabled to appreciate their value than we can do with the English report, which gives only the conclusions at which the experimentalists arrived. For my own part, I cannot but think that the photographic image is composed of metallic silver, the particles being enveloped in organic matter; and shall maintain that view until another is conclusively established. It is very desirable, for the credit of the art, that this question should be satisfactorily settled.

One of our most distinguished photographers, Ernest Mayer, has originated a benefit society, under the title of "Photographic Union," a description of which, I think, will interest you. Most professions and crafts have established similar societies among their followers, and of their utility there can be no sort of doubt. The disciples of photography and its auxiliary arts have become so numerous that a benefit society is as much needed among them as among any other artists or artisans.

This Photographic Union consists of photographers proper, colourists, retouchers, and others devoted to the art: there are enrolled members, honorary members, and donors, also members. The objects of the society are to procure medicine and medical aid for its members; to provide the funerals of those who die poor, and to assist the widows, and the orphan children of deceased members who have not arrived at fifteen years of age; and also to bestow pensions on those who may become unable to pursue their calling from infirmity, accident, &c.

The number of members is at present limited to five hundred, which number may be hereafter increased. The number of donors and honorary members is unlimited. Members must be over eighteen and under fifty; subscriptions paid monthly. Members become entitled to the advantages of the association at the expiration of three months after they have joined it.

Members are entitled to medical attendance and medicines during the whole period of their illness, and to a payment of one and a half franc a day during the first three months; the Council to determine if the allowance should be continued after that date; and if it be, only half that sum to be allowed. If the illness continue longer than six months, the member to be considered as incurable, and assistance will be rendered on conditions arranged by the Council.

Members who have been enrolled twenty years, and have attained the age of sixty years, will be entitled to pensions.

I am not aware that a similar society exists among English photographers; I have, therefore, communicated the particulars to you, in the hope that the suggestion of this union may lead to the formation of a similar society in England. I think it well worthy serious consideration.

Mr. Maxwell Lyte has received a silver medal from the Bourdeaux Photographic Society, as an acknowledgment of the excellence of the proofs he sent to it for exhibition.

Mr. Woodward's solar camera has roused the Parisian opticians. M. Chevalier refers to his megascopic camera, invented many years ago; and M. Jamin to one of his invention, made some five years since. This consists, first, of a bi-convex or plano-convex lens, arranged so as to throw a luminous ray through the photograph; and second, of a mirror mechanically inclined, so as always to throw the ray upon the centre of the lens; and third, of a combination of achromatic lenses intended to recover the image of the negative, and project it upon a screen, which is movable according to the size it is desired the image should be.

He has not adopted a special arrangement of lenses to produce the image. All achromatic combinations are suitable whenever the focal distance is double the size of the photograph to be reproduced. Besides, the shorter the focal distance, the larger the image is at a short distance and the stronger the light, and consequently the more rapid the reproduction.

For this instrument to act satisfactorily it would be necessary to connect it with clock-work, so that it could be made to follow the course of the sun, and the light reflected from the mirror be cast on the centre of the lens. In the experiments already made each proof required about an hour's exposure to the action of a powerful sun light. J. P.

New Books.

Harmonious Colouring as applied to Photographs. By an Artist-Photographer. Second edition.

London: W. Kent & Co., Paternoster Row; James Newman, Soho Square.

We had occasion to notice this work favourably on its first apearance not many months back A second edition having been called for within so short a space of time is no slight evidence of its popularity, and we may reasonably suppose also of its excellence. The first thing which we notice as new is a copious index prefixed to the book, which will no doubt be duly appreciated, for nothing can well be more tiresome when wishing to refer to some particular point that may have struck the reader when first perusing it, than the annoyance of not being able to hit upon it again without going through it *de novo.* The coloured illustration of the effects resulting from the admixture of the primaries and secondaries with one another has been omitted; but the price has been reduced more than fifty per cent. as a compensation.

The whole work has undergone general revision, and a considerable addition has been made to the chapter on colouring *alabastrine* positives, as they have been called—that is, positives whitened by the use of a solution of perchloride of mercury. There is one addition which will no doubt prove a very great attraction to amateurs especially—a chapter on colouring stereographs, the more especially as the method of operating appears to us to be easiest of the whole; but we are perfectly unsophisticated in the practice of this art, so we may be mistaken.

Correspondence.

THE ARCHER FUND.

To the Editor.

Sir,—I have read with much pleasure in your widely-circulated Journal the letter of a "London Photographer" on the subject of the Archer Fund, and the humane wish with which, in a foot note, you so considerably commended it to the notice of your numerous and charitable readers.

Although not profiting materially from the practice of photography myself, I have yet felt called upon, in however slight a degree, to acknowledge my obligation to the late Mr. Scott Archer — an acknowledgment which I have made by forwarding to the Archer Fund Committee* the small *annual* donation of one guinea. I am of opinion with those who think that the photographic world have unquestionably in this case a moral duty to perform, the which, if it be withheld, will infallibly reflect discredit upon the profession; and it is with professions as with individuals — the performance of a moral duty can never be deferred, much less omitted, without moral injury, while the converse holds equally good; and the performance of every such duty is attended with increased dignity and self respect, and all their concomitant advantages — a moral reward, which is always proportioned to the cordiality and promptitude with which the duty is performed.

It cannot be that any one, much less a parent, can day after day practise the collodion process without now and then turning a thought to the orphan children of the man to whom above all others he is indebted for, as the case may be, either his pleasure or his profit.

A noble example has been set in this instance by Her Majesty the Queen and His Royal Highness the Prince Consort, who, with a readiness which must have given double value to their generosity, acknowledged most unequivocally their sense of the obligation that was due, not only from photographers and all who benefit, either directly or indirectly, from photography, but also from the public in general, for whom this beautiful and useful art has presented a new and extended pleasure, of the most refined and elevated description.

Sorry should I be, Sir, for the credit of all that is noble in human nature, and most of all in Englishmen, to see either the one or the other indifferent to the claim of these poor children, or that strong claim either niggardly or sluggishly acknowledged. Depend upon it that it would be a reproach that would adhere to them indefinitely.

I am yours, &c.,

Braemar, Aberdeenshire. THOMAS PEARCE.

* Sir W. J. Newton and Roger Fenton, Esq. — Ed.

DRY PROCESSES.

To the Editor.

Sir, — What is the *rationale* of the dry process? the albumen is always washed off. What effect has albumen, or any other similar fluid, oxymel gelatine, &c., on the *sensitised* plate, which thus preserves its sensitive qualities for such long periods? Under what circumstances was the discovery made, and what *led* to the adoption of albumen, &c.?

I am yours, &c., A SUBSCRIBER.

[Albumen, &c., combines with the nitrate or with the oxide of silver, forming thereby a compound capable of becoming blackened under the influence of light. Iodide of silver *readily* receives the actinic impression, but is not thereby blackened; it however communicates the necessary impetus to the organic or other compound of silver in contact with it. The *whole* of the albumen, &c., is not washed off, because it is in part rendered insoluble in water. Collodion simply sensitised, washed, and dried, is well known to be sensitive to the actinic rays, but the difficulty of its employment alone consists in its impermeability to the developing solution when dry, and its tendency to be stripped from the plate during the operations of developing and fixing. The albumen materially assists not only in rendering it more easily acted upon, but also in causing its adherence to the plate. It is commonly asserted that pure iodide of silver is insensitive to the action of light: we have considerable doubts on this point; it may be only a question of development; indeed certain experiments which we have performed tend strongly towards this conclusion. The knowledge of all these facts was not arrived at by a single experiment, of course, but it appears to have arisen somewhat as follows:—It was at first thought that in order to retain the excited collodion film in a sensitive condition, *moisture* was a *sine qua non*—hence the nitrate of zinc and nitrate of magnesia processes suggested by Messrs. Spiller and Crookes: these salts being highly deliquescent were intended to counterbalance the effects of evaporation, by their power of absorbing moisture from the atmosphere. Honey, syrup, and oxymel (a preparation of honey and vinegar), glycerine, and the like were shortly substituted as more conveniently applicable, the principle however being supposed to be nearly identical with the preceding—that is to say, they were applied with a view of preventing the moist film from becoming dry, and successfully so; but in practice it was found that they did more than this, the negatives obtained acquired much greater intensity than without the use of the honey. Dr. Mansell, of Guernsey, pointed out that a compound insoluble in cold water was formed between the honey and silver salt. About this time a *dry* collodion process was being sought for in every direction. Mr. Mayall stumbled upon the fact that if a collodionised plate were sensitised in a nitrate of silver bath which had been used for *albumenised* plates, after washing and drying the former, they were impressionable by light, and subsequently developable. Mr. Barnes also succeeded in employing plates coated with collodion upon albumen, sensitised, washed, and dried; but the impression at that time was strongly maintained that success was principally dependent upon the structural condition of the collodion. In France, M. Taupenot thought of coating a collodion film with one of albumen, having the idea that as a sensitised film of dry albumen would keep active for a considerable time, though slow to receive the impression, and as collodion readily received the actinic impetus; by using both he hoped to gain the advantages due to both films. In this he was to a considerable extent successful, and it is indisputable that the molecular condition of the surface exerts a considerable influence upon the result. The Taupenot process was certainly the origin of the various modifications of the collodio-albumen processes. Dr. Hill Norris, of Birmingham, was of opinion that the only reason why collodion when moist is more sensitive than when dry is, that in the latter condition it is less permeable, hence he suggested the employment of a film of gelatine, applied while the collodion is still moist, with a view to preventing the absolute coherence of the particles of the film. The Fothergill process arose out of the collodio-albumen ones in consequence of a better knowledge of the part played by the albumen to which photographers had by observation attained; but it is principally since the practice of the Fothergill method has been pretty commonly adopted that the true part enacted by the albumen has been ascertained. Such are, we believe, the leading features of the various steps that have resulted in the dry processes as at present practised.—Ed.]

DIRECT TRANSMITTED POSITIVES.

To the Editor.

Sir, — Your notice of M. Poitevin's endeavours to produce direct transmitted positives in the camera reminds me of a phenomenon which has often come under my observation, but which I have never been able to account for, and seldom have been able, with certainty, to reproduce. After exposing a collodionised glass-plate, and commencing to develope in the usual way for a negative, I have found that upon admitting white light for a second before the development is complete, the result is not a negative picture, but a positive by transmitted light: the lights are transparent, and the shadows dark. I have not had time to follow up the process, but I doubt not that by careful experiment and observation of the proper time for letting on the light, for shutting it off again, and for discontinuing the developing, the result will be as constantly perfect as I have often by guess alone obtained it. I am, yours, &c., H. E. N.

[The method above suggested for producing direct transmitted positives was brought forward at the October meeting of the French Photographic Society, as well as the more certain one that we gave. Mr. Rippingham, of the London Society, also made use of it some time back. It is, however, exceedingly uncertain in its results, *especially as regards the half-tones*, and it not unfrequently occurs that a part of the plate is developed as a negative while the remainder comes out as a transmitted positive. We have much greater hopes of M. Poitevin's mode of manipulation; but in any case would be glad to find some of our practical photographers at work upon the subject in either direction. — Ed.]

Photographic Enamel. — We have on many occasions had enquiries from various correspondents for information relative to the brilliant surface noticeable upon some stereoscopic slides. No doubt many of these owe their lustre to the use of very highly albumenised paper, but some have a polish still greater than can be thus accounted for. We have recently received a small specimen photograph from Mr. S. Gans, 17, Queen Street, Cheapside, London, with a surface as polished as some of the elegant French cardboard boxes, so attractive at the present season; and this, we are informed, is due to the use of what he calls *photographic enamel*, but of what it consists, and how applied, we do not know. We notice it, however, as probably supplying the requirements of our enquirers. We should not think it possible to produce a more lustrous surface than we find upon the specimen before us. Mr. Gans asserts that the enamel tends to the preservation of the photographs: of this we could judge better if we knew the composition of it, but it is not improbable that it may protect the proof from atmospheric deleterious influences.

ANSWERS TO CORRESPONDENTS.

☞ A Photographic Sheet Almanack is given free with the present No.—The Title and Index for the Volume for 1859 will be issued with our next.

D. T.—By all means take No. 2.

J. Teesdale.—You will find a reply in our present Leader.

C P.—Iodide of ammonium, two grains; iodide of cadmium, two grains; bromide of cadmium, one grain.

Enquirer.—We report strictly as we find to be the case without flinching; so if you seek it you must take your chance.

Brookfield.—See our notice of Mr. Wilson's Scottish gems, in the present number. Mr. Sedgfield also has produced some fine interiors.

Martha N——.—Photographic printing is a very good occupation for a female; in fact, females generally turn out the best printers.

Wm. Birkenshaw.—If you do not find a satisfactory reply to your enquiry in the pages of the present number, you will certainly do so in our next. We expect, "before going to press," an article on the subject.

Stupid Tom.—Not so stupid. We are not surprised at your perplexity: every one advertises the *best* in the market; and as it is impossible that more than one can be truly so described, the absurdity of such a statement is patent enough. However, to assist you we will suggest that you should procure some of Nos. 4, 7, and 8, on your list, which are all very good, but differ somewhat in working. Try which of these suits you best and stick to that one.

J. Andrews.—See reply to "Inquirer."

North London Photographic Association. — Owing to a press of matter, and the late hour at which the copy reached us, our report of Wednesday's meeting is left over.

*** Several matters for criticism which we have received are necessarily postponed. We have been obliged to give extra space in this number, and yet want room; besides which we have not yet had sufficient time to study properly the subjects omitted, in order to give a report according to their merits.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 110, Vol. VII.—JANUARY 15, 1860.

Whatever may have been the case with the first two meetings of the Photographic Society for the present session, that held on Tuesday, the 3rd instant, was a decided success. The paper read was by Mr. Hardwich, and it appeared to give general, not to say universal satisfaction; which is not surprising, seeing that, as usual with this gentleman's productions, the matter was both interesting and instructive, dealing more with principles than with practice, though the latter element was by no means overlooked. The discussion was both animated and much more to the purpose than is sometimes the case, less digression than usual having been indulged in; yet, for all that, the sitting did not terminate until some time past ten o'clock. There were various matters exhibited—amongst them Mr. Smartt's portable dark tent, with some recent improvements, which Mr. Heath described; a number of negatives by Mr. Barnes, taken upon dry collodion, with some sort of written description, which nobody had time or opportunity to read, appended to one or two of them; and some indifferent positive proofs labelled *calotypes*, which were not described. There were also on the table some of Mr. Russell Sedgfield's beautiful stereographs, which needed no description; and some carbon prints by M. Joubert, which the producer declined to describe—altogether producing an effect "more easily imagined than described."

We have at length experienced some curiosity to know by what method of procedure a carbon print can be produced, that is, such carbon prints as were exhibited by M. Joubert, which we are ready to admit were *very good*, more nearly approaching to silver prints than any that we have hitherto seen. The lights were clear, the half tones delicate, and the shadows intense—not quite so transparent as might be desired, but still good. There was one peculiarity that we should like to have accounted for, viz., the sides of the picture were transposed, some letters visible on a bill requiring to be read from right to left. We understood M. Joubert to have asserted that the proofs were absolutely light-printed by direct contact with the negative, or we might have inferred that they were obtained by an impression having been first transferred to metal or stone, from which copies were procured by some kind of chemical printing—a highly useful application no doubt, but still not a solution of the problem of carbon photographic printing, as generally understood. It is possible that, in using the term "negative," M. Joubert meant thereby simply the glass original which he employed in succession for each of his proofs, but that it was in reality a *transmitted positive*—in this case the problem may really have been solved, and we may be much nearer to a revolution as regards silver printing than most of us are inclined to expect. Two very important steps in advance have been attained—the rendering of half-tone and cleanliness of the lights, these having been the two greatest stumbling-blocks hitherto existent in this branch of photography.

While on this subject, we may venture to make a few comments upon some specimens not very long ago issued by a contemporary, and purporting to be *photographic* carbon prints by Mr. Pouncy, from a negative by Dr. Diamond. It is not a little singular that these have also their *sides reversed* with regard to the original, and that the *negative* is simply a copy of an old engraving *in line*, in which there is absolutely not a particle of half-tone. Moreover, on comparing the copy and the original, we find that the lines are much thicker and coarser in the former—in short, they look very much as if they were lithographed, a fact which, taken with the reversal in position, appears highly probable. We are also credibly informed that an able chemist has very carefully tested a print for oxide of chromium, not a trace of which he can detect, and taking all these circumstances into consideration, we are of opinion that the assertion of the proofs issued having been obtained by Mr. Pouncy's process is not made without some *arriere pensée*—obtained by *a* process of some kind by Mr. Pouncy, though not by *the* process already claimed and published by him. This is a matter that we think calls for some distinct and unmistakable assertion from Mr. Pouncy. Carbon prints they are no doubt in one sense, but we believe them to be also *lithographs*.

ON COLLODION FOR THE DRY PROCESSES.

By T. F. Hardwich.

[Read at the Meeting of the London Photographic Society, January 3, 1860.]

In the first attempts to prepare a collodion suitable for dry processes it was found that there were advantages in making use of materials like rotten cambric, shreds of filtering paper, old lint, and other like substances in which the cellulose has undergone partial disintegration by the action of chlorine, caustic alkalies, &c.; a pappy und broken-up structure of collodion being more easily obtainable in that way than by working with the fine cotton wool as it exists in the raw material. Nothing, however, will be said in the present paper on the use of these bodies, since it is now well established that both uniformity of product and stability of collodion are, to a great extent, sacrificed by their employment; and further, that the fibre of linen, being chemically different from that of cotton, does not yield a similar quality of collodion. All must be done, therefore, with the best cotton wool, and we must look to the nitro-sulphuric acid for bringing about the physical and chemical modifications which are required.

The first experiment which gave me a clear idea of the *rationale* of producing collodion suitable for dry processes was made at the time when so much was said of Gaine's process for making vegetable parchment. It occurred to me to try how this modified cellulose would succeed in the preparation of pyroxyline, and I therefore cut a piece of paper into several slips, and floated them upon the diluted oil of vitriol for varying periods of time—five, ten, fifteen, twenty, forty seconds, and so forth, afterwards washing with water, and drying each piece perfectly. The shrinking and toughness of the paper appeared to increase with the time on the acid, and, in the case of the pieces last removed, there was a peculiar jelly-like feeling whilst they remained in the washing-water, as if a chemical change had commenced. Now these pieces of parchmentised paper, on being subsequently dipped in nitro-sulphuric acid at 130°, all yielded pyroxyline soluble in ether and alcohol; but there was a marked difference in the quality of the collodions so made, for whilst the earlier samples gave a fine and tough film, the later ones—those left longest on the sulphuric acid—produced a collodion which is known as *powdery*, rubbing up under the finger like soft soap, and adhering very tenaciously to the glass. The inference was, that the parchment collodion resulted from the first or action proper of the sulphuric acid, and that the powdery pyroxyline was due to a subsequent or disintegrating effect of the same acid, which perhaps might be a partial change into dextrine. At the time, it seemed to me logical to draw the above conclusion, but facts have since come to light which show that it is not entirely correct.

Modifying Action of Sulphuric Acid.

When it became evident that the sulphuric acid exerted a modifying action in the manufacture of pyroxyline, the next question was, whether a mixture of oil of vitriol and nitric acid could be made in such proportions as to produce at once the full effect, and so to yield a product corresponding to that which is obtained when the fibre is first parchmentised, and afterwards made into a substitution-compound by nitric acid. If this were possible, the action of the sulphuric acid must precede that of the nitric acid, because, although it is easy to make the vegetable parchment into pyroxyline, yet pyroxyline, once formed, cannot afterwards be changed in properties by immersion in diluted oil of vitriol, but is protected and remains in the acid without shrinking. Therefore, in order to give the preponderance to the sulphuric acid, we make the bulk of that acid relatively greater, and in this way the parchment quality of collodion may be obtained.

If, however, the theory above propounded were correct, that the action of the oil of vitriol has two stages, a condensing and a disintegrating stage, it ought to be quite possible to prepare the porous or soapy pyroxyline in the same acid mixture which is found to answer for the parchment pyroxyline, and especially since we have it in our power to increase the action of the acids *by raising the temperature.* Experiments, however, afterwards proved that the mixture of three measures of oil of vitriol to one of nitric acid was not the best for preparing the most powdery kind of film, and that no increase in temperature or alteration in the proportion of water sufficed to give the desired result. Nothing remained, therefore, but to consider the theory afresh, and on doing so the weak point soon came to light, viz., that I had overlooked an effect of the *nitric acid,* not hitherto described, and that, to produce the pulverulent state of film in perfection *in one mixture,* the nitric acid ought to be in excess over the sulphuric. It appeared, however, that the most complete disintegration resulted when the nitric acid was brought to bear upon a material which had previously been acted on to the full extent by oil of vitriol; and this explains why, in the experiments with the strips of parchment paper, the latter samples of collodion were so entirely porous, viz., *those produced from the material which was at the verge of transition into dextrine before it entered the nitric acid.*

Preparation of either kind of Pyroxyline at will.

Having perfected the theory, it now corresponds with the experimental results, and either quality of collodion becomes obtainable at will; for if in a mixture of three measures of oil of vitriol, one of pure nitric acid of 1·45, and rather more than three-quarters of a part of water, there be immersed cotton, at 150° F., the fine transparent, tough material containing a minimum quantity of the peroxide of nitrogen is prepared; to convert which into the powdery pyroxyline we have only to dry it, and dip it for an instant in a mixture of the same acids, and at 150°, but with the proportions reversed, viz., three measures of nitric acid to one of sulphuric, in place of three of sulphuric to one of nitric, the water in the formula being omitted.

In this process a very short immersion of a few seconds suffices, and there is not much loss from solution; the pyroxyline does not gelatinise in the hot nitric acid, and can afterwards be easily washed in water; but it loses nearly all its tenacity, and flies about in dust when it is dried and rubbed by the finger. Its properties undergo an important change as regards the action of solvents, for whereas it was before unacted upon by absolute alcohol in the cold, it now liquifies into a gummy mass on treatment with this liquid. In collodion the properties differ widely from those of the parchment pyroxyline, the latter setting firmly and quickly upon the glass, but the former being nearly deficient in power of setting, so that, if the proportions of the ether and alcohol remain the same, when you allow five seconds in the one case before dipping the coated plate in the bath, sixty seconds would be required in the other. The parchment pyroxyline forms a somewhat opalescent film on dipping in the bath if the collodion be only moderately iodised, but the powdery pyroxyline produces a dense and creamy film under the same circumstances. If these films be washed with water and dried, the former has a varnished appearance, and may be rubbed with the finger without injury, but the latter is lustreless, and seems to exhibit the iodide upon the surface rather than in the substance of the film. When the sensitive plates are washed with water, and reared upon blotting-paper to drain, the parchment collodion soon assumes a condition in which it is not easily wetted, but the pulverulent film remains without much change, and a solution of albumen or developing fluid flows quite up to the edge, without receiving any check.

Although the effect produced upon the pyroxyline by the second treatment with hot nitric acid is so remarkable, we cannot suppose that any fresh peroxide of nitrogen is imparted to the fibre; three measures of nitric acid of 1·45, when mixed with one measure of oil of vitriol, produce a weaker nitro-sulphuric acid than is usually employed in the manufacture of pyroxyline, as may be proved by the immersion of cotton wool. The wool is rendered soluble at a temperature of 150°, but the film becomes cloudy on drying, and the pyroxyline itself burns in the manner of the compound made in weak acids. It dissolves also in hot glacial acetic acid, a property which Mr. Hadow mentions as peculiar to the weakest of the two substitution-compounds available for photography. This pyroxyline, which is made in one acid only, does not however correspond exactly to the other, prepared, as before said, in two different mixtures, although the state of dilution of the nitric acid in the two mixtures is nearly the same; for not only is that which has been acted upon by the oil of vitriol in addition to the nitric acid more broken up, but it yields a very limpid, structureless collodion, which adheres firmly to the glass.

Effects Contrasted.

We now pass on to examine the action of these collodions in the dry processes, taking in preference those of Taupenot and Fothergill; and I may mention that the majority of my experiments have been made with the Fothergill process, inasmuch as the plates are readily prepared, and show very characteristic differences in development. It was stated by Dr. Norris, in his early papers on the dry process, that a powdery structure of collodion allowed a ready penetration by liquids, and so favoured quick development. This may be true to a certain extent; but, in my own experience, I have found that energy of development depends much upon other causes independent of physical structure. On comparing the horny parchment collodion with that in which the film is made porous in the mode previously described, it is evident that both yield feeble images when newly iodised, but that the powdery collodion does so especially; not that this image develops more slowly — on the contrary, it comes out rather rapidly, but it has a peculiar *grey tone,* such as would be produced by nitric acid in the bath. This metallic aspect of the image depends upon the pyroxyline, and has nothing to do with imperfect washing or impurities in any form, which should be carefully guarded against in an investigation like the present. The weaker the acid, and the more powdery the film in consequence, the worse the defect, and, in reflecting on the cause, I was led at length to attribute it in part to the peculiar manner in which the iodide is precipitated in a film of this structure, for on one occasion the whole picture dissolved off into the fixing bath, leaving the collodion intact upon the glass, thus rendering it evident that the iodide of silver was not imprisoned by the pyroxyline in the usual manner, but simply rested upon its surface. To overcome this, the same pyroxyline was dissolved in a mixture consisting principally of ether, with only a small quantity of alcohol in the absolute state, and iodised with the cadmium compounds in preference to those of the alkalies. By this proceeding a more contractile film was obtained, which bore rubbing without losing its iodide, and on trial it was found that the intensity of the image was decidedly increased, a brown tone having taken the place of the grey.

As the question of colour and intensity of image is of importance, I shall not leave it without making a few more remarks. Why would the fact of the iodide of silver resting merely upon the surface of the film in the case of the powdery collodion be calculated to lessen the density? Probably because the pyroxyline made in the way which I recommend is not altogether inert to the salts of silver, but has somewhat of that action which we find possessed by albumen and many other organic bodies, of increasing the intensity of the developed image. This position I am quite able to maintain; and if we allow it to be true, it suggests the importance of having the iodide *in* the film as well as upon the surface.

We now pass on to consider the effect of keeping the collodion for a time in the iodised state before using it and I may mention that in the experiments a portion of *bromide* was associated with the iodide, not only because it has a more decided action in carrying down organic matter, and fixing it upon the film, but also because the use of bromide in the dry processes does not retard the development or make the image metallic, as it does in the wet. The bromide and iodide of ammonium and cadmium in the proportions used for positive collodion form a mixture very proper for the purpose.

The horny collodion newly iodised is extremely sensitive in Fothergill's process, but the image develops somewhat feebly, and with a long-focus lens in a subdued light there would be a want of contrast. This condition of collodion does not allow of too much washing before the albumen is laid on; otherwise the above-mentioned defects increase and the development becomes difficult to manage. Old iodised collodion differs in this respect from new: there is more decision and contrast in the picture, and supposing the preparation to be in a certain state, the plate may be washed rather freely with water previous to the application of the albumen, without interfering much with the intensity. This, therefore, is the point to which my attention was directed,

Organic Decomposition.

Whatever be the exact nature of the change which takes place in collodion after iodising with the alkaline iodides, we cannot doubt that in its essential features it consists in the pyroxyline displacing a portion of the base, and in some manner neutralising it. We therefore strive to imitate this change by adding a portion of free alkali to the collodion; and, as far as my own observations extend, the effect of all the alkalies and alkaline carbonates is nearly the same, photographically speaking. If there be a difference, it is rather in point of time and in rapidity of action than in any more essential particular.

Taking a sample of the horny collodion, made as before described, I add to each six drachms, two drachms of absolute alcohol in which has been dissolved a quarter of a grain of pure potash free from carbonate. The liquid immediately becomes ropy, and, with a less proportion of alcohol, semi-gelatinous. In a very short time, however, the ropiness goes off and the collodion is then rather more limpid than previously to the use of the potash. At this stage, a few drops of an alcoholic solution of nitrate of silver, added to a small portion of the collodion in a test tube, produce a *white* turbidity. If the cloudiness should be white at first but afterwards assume an olive-brown tint, a portion of the potash still remains in the collodion in a free state. Perhaps the safer plan will be to allow the action to continue for twenty-four hours, after which the precipitate produced with nitrate of silver will be quite white, and it then remains only to dissolve in each ounce five grains of iodide of cadmium and one grain of bromide of ammonium. If these proportions should produce *a blue film*, to which there is always a tendency in collodion having undergone decomposition, they may be increased.

The photographic properties of collodion modified in this way are very remarkable, and, on making trial of it in the dry processes, we see at once that an important change has been produced. The tendency to active development is so strong in Fothergill's process, that it matters very little in this respect how far the washing is carried before putting on the albumen; for, even if the free nitrate of silver be fully removed by copious treatment with distilled water, there is no difficulty in obtaining a dense picture. In the oxymel process, the plates develop with a bloom and ruby red colour, like wet collodion, and are in danger of running into red solarisation. I notice also a clearness and brilliancy in the image, such as usually accompanies a state of film giving intense development; the action of the reducing agent seems so strongly determined towards those parts of the film which have been touched by light that it expends itself, and hence the shadows are preserved in a state of transparency.

There is one objection to the use of alkali in the manner now advised, viz., that the collodion is rendered very tender. The state produced cannot properly be called *powdery*, a more correct term would be *rotten*. If ammonium compounds are afterwards used in iodising, the film, already weakened as far as it will bear, sometimes gives way, whilst, if cadmium salts are substituted, the adhesion to the glass is lessened and the collodion wrinkles during development. This tendency may be overcome by applying a preliminary coating to the glass, after which the working of the collodion is everything that could be desired. Those who are conversant with the peculiarities of the different kinds of collodion employed in the wet process will readily understand that the state of film now under discussion sometimes fails in rendering the half-tones, and that a hard quality of picture may be produced, unless the proper conditions are understood.

Before passing on to consider further the chemical nature of the changes which take place by the action of alkalies on collodion, it may be well to observe how cautious we should be in recommending any new step in photography without stating all the conditions. The addition of potash, for instance, is a most hazardous proceeding, and one which may bring disappointment. The mode of preparing the pyroxyline must be taken into account, since some kinds are much tougher than others, and will resist a larger quantity of alkali without becoming limpid. This I show by taking three kinds of collodion — *a*, from parchment pyroxyline — *b*, from cotton wool immersed in hot and weak nitric acid, with minimum of sulphuric acid — *c*, from pyroxyline made out of calico. On adding a similar quantity of alcoholic solution of potash to each, the first becomes glairy and subsequently liquifies to the proper consistence, turning at the same time slightly yellow. The second remains colourless, and precipitates a thick white substance, above which floats a limpid liquid almost free from dissolved pyroxyline. The third behaves differently from either, being liquid from the first, and not passing through the ropy stage.

The action of potash upon pyroxyline is decidedly complex, and, although Mr. Hadow has interpreted it under certain conditions, it does not appear to me that the reactions are the same when the alkali is employed in a minute quantity and at a low temperature, as I advise. One thing, however, is clear, that, under all circumstances, *nitrite* of the base is formed, and indeed I have seen definite crystals of nitrite of potash in residues of iodised collodion after fourteen months' keeping.

An alkaline nitrite, such as that of potash or soda, precipitates a white compound with nitrate of silver, and this substance is only sparingly soluble in water. Therefore, if we suppose a collodion to contain a nitrite in addition to iodide, the film, after removal from the bath, may be expected to bear a very large amount of washing without entirely losing its soluble silver salt. The effect of nitrite in the *wet* process is to accelerate development, and to increase the contrast between the extreme tints. I find that it acts in the same manner in the dry process; and hence it may prove of service in some cases.

Modifying Action on Chlorides.

Collodion containing nitrite, even to saturation, does not produce the same decision of image as that to which potash has been added. This I attribute in part to the fact of *organic decomposition* of the pyroxyline being produced by the potash, which renders it more difficult to wash out all the soluble silver salt. The subject is a difficult one, and needs more investigation, but I will mention a few facts which bear upon it. There are organic substances which produce no precipitate in solution of nitrate of silver, and yet can be shown to combine with it in a loose and ill-defined way. One of these bodies is *gelatine*, as the Committee which reported on the subject at the late meeting of the British Association has shown. If a sheet of gelatine be dipped in a nitrate bath, no subsequent washing will altogether cleanse it from the nitrate of silver; on the other hand, gelatine will withdraw nitrate of silver from its aqueous solution, and appropriate it to itself. The substance produced may be termed "gelatino-nitrate of silver," and one of its properties is, that it has the characteristic bitter metallic taste, but gives no precipitate with a minute quantity of chloride of sodium. I find also that *powdered gum-arabic*, on being digested in alcoholic solution of nitrate of silver, retains some of the nitrate most obstinately; for if the gum be dissolved in water (after repeated boiling with fresh portions of spirit until nothing more can be extracted), the solution has a strong bitter taste, and remains clear for a time on the addition of chloride of sodium. A third experiment was conducted as follows:—pyroxyline of that kind which has been fully acted on by the sulphuric acid in the process of manufacture, and which the experience of photographers shows to give an unusually intense image in the negative, was soaked for one hour in an alcoholic solution of nitrate of silver, in the dark: it was then washed very carefully in about twenty changes of distilled water, the washing being continued long after all traces of free nitrate of silver had disappeared; nevertheless, this pyroxyline, on being dissolved in ether and alcohol, gave a brown turbidity with hydrosulphate of ammonia, and on being treated with salt remained nearly clear at first, but afterwards became slowly opalescent.* It must be confessed that the above experiments are, with the exception of that in which gelatine is used, of an extremely delicate nature, and could not safely be depended upon if taken alone; viewed, however, as corroborative of other undoubted facts, they are interesting, and since the photographic and the chemical results tally so exactly with each other,

* A pure solution of nitrate of silver throws down a precipitate immediately, with chloride of sodium; but when these organic substances are present, either no precipitation whatever occurs, or the liquid remains clear for a time and afterwards becomes gradually opalescent. In the same manner, collodion prepared from that kind of pyroxyline of which we have been speaking may contain a weighable quantity of chloride of cadmium, and yet on dipping in the bath no precipitate may be produced, the film remaining clear and transparent.

we may safely affirm that, although pyroxyline is usually viewed as indifferent to salts of silver, yet that there are some varieties of that substance which are more or less organic in their reactions; and, further, that any sample of pyroxyline, after undergoing partial decomposition by action of alkalies, will abstract a portion of nitrite of silver from the bath, independent of the presence of nitrite, chloride, or iodide. Pyroxyline, in this state, takes its place as the lowest member of that class of photographic substances containing albumen, &c., all of which are useful in processes where the plate is washed with water previous to its exposure in the camera.

At the outset of this investigation I had hoped to perfect a method of purely dry collodion without any preservative substance applied to the surface of the film, but at present I am not so sanguine of being able to do so. The principal defect of Fothergill's process is the slowness of development, which appears to be due in part to the film drying up, and not recovering its porous condition on being wetted. Gum or gelatine prevents this, for, although the film shrinks, as before, on drying, yet when water is applied, it returns to the spongy or villous state which it had on first leaving the bath, and the development is accelerated. The experiments which I have made confirm all that Dr. Norris has advanced, but they lead us a step further, for it is now impossible to deny that these preservative substances have a chemical as well as a mechanical action, and that the colour and general aspect of the image will vary with the particular organic substance which is selected.

OBSERVATIONS ON THE NATURE OF THE VARIOUS KINDS OF COLLODION.

By Mr. Eliot.

[Read at the Meeting of the London Photographic Society, January 3, 1860.]

Although I have not had much experience in the various dry processes, having only tried them during part of one season, I found, from the uncertainty of working in the dark, the consequent loss of time was more expensive than the hire of a boy to carry the few extra things required for the wet process; yet, having given my attention for some time to the manufacture of collodion, I may be allowed to say a few words on the chemistry of this most useful article.

Collodion, then, although it is susceptible of an infinite number of modifications, from variations in the acids and their temperature, proportions of the solvents and the iodides employed, yet appears to me but to exist in three distinct forms:—1st. The hard horny film, with a glazed surface, in which the iodide of silver is imprisoned, so that neither the light nor the developer can penetrate, giving, when freshly iodised, a weak picture all over, and after it has been kept some time, intense high lights and weak middle tints, with almost any lengths of exposure. This sort is totally unfit for any description of photography.

2ndly. The extremely porous film produced from old rags, paper, &c., exposed to acids at a high temperature, but which Mr. Hardwich has shown this evening can be formed by a more certain and uniform process. In this film the atoms of iodide of silver are in close contact, and adhere together something similarly to the particles of the iodide precipitated in a glass measure, or better still, to the chloride, which, when allowed to settle down in the dark, and is then exposed to the light, little more than the surface is acted on, and consequently it will only give a weak picture. I shall return to this variety again presently, when I have finished with the next and last.

3rdly. The extremely gelatinous and slightly porous film. This is made by the first process of Mr. Hardwich—namely, by exposing the best cotton wool at a moderate temperature to the mixed acids, with excess of diluted sulphuric acid, then dissolving with as large an excess of the strongest alcohol as possible, and iodising with mixed iodides of cadmium and potassium. It is a singular fact, which has before been noticed, that the iodide of potassium, which alone is sparingly soluble in strong alcohol, readily dissolves when the two salts are triturated together before being put into the spirit, or the cadmium salt first dissolved, and the powdered potassium salt afterwards. The reason is, I believe, that a double and more soluble salt is formed. The film from this collodion is in a more expanded state, and the particles of iodide are separated similarly to the particles of sand in a new sponge, which to the touch feels gritty everywhere, but when washed out are in a very small proportion; consequently, with this kind of film the light can penetrate, and it gives a more intense picture. I am aware that some operators find a difficulty in coating large plates with this kind of collodion, but I think it is due to their method of manipulating.

I have seen some persons, directly they have covered a glass, pour off the collodion, and tipping the plate into a vertical position, hold it so, merely rocking it from side to side, until the collodion has set, consequently the collodion drags and sets in ridges, disintegrating the film, and giving the iodide a granular appearance on the lower half of the plate; instead of which, if the plate be tipped at a low angle not more than forty-five degrees and *gradually* lowered, and as the film sets, running the finger, or, better still, a roll of bibulous paper along the edge, a ridge of not more than one-eighth of an inch will be left, which will be lost in the slide. I do not mean to say the same thickness of collodion should be used for small as for large plates, or that the season of the year should not be taken into account; but it will be found the nearer the collodion approaches to this state the better it will be for all wet pictures. The proof of a good collodion I hold to be this: that when under-exposed it will give a weak impression all over; with more exposure, one a little stronger, and with sufficient exposure at least approaching to the contrast of nature, the middle tints getting stronger, while the high lights remain the same; with over-exposure universal solarisation, that no matter how long it has been iodised, it will work still in the same manner, only requiring longer exposure. A bad collodion, on the contrary, gives only a weak picture when newly iodised; when older, strong high-lights which a longer exposure only renders more opaque; and with weak middle tints, never with any exposure getting much stronger than a positive.

I now return to the porous collodion. It appears from what I have already said, and from Mr. Hardwich's experiments, that even this is not fit for the dry process, for unfortunately the more gelatinous is the film, the more it shrinks in drying, and is less able to recover itself afterwards for the development. Dr. Hill Norris's process is not so bad in this respect as Fothergill's, but the plates are much more difficult to prepare and dry evenly; they are also much more liable to blister, but then they expand better afterwards and develop more readily. I think a mixture of the two, or the addition of two ar three grains of gelatine to the albumen of Fothergill's might be an improvement, and cause the plates to develop more quickly. It is in consequence of not readily producing intensity that Mr. Hardwich has been obliged to bring about a decomposition of the pyroxyline with potash, forming an organic salt with that alkali to afterwards act on the silver. It has been doubted by some, whether such salts, as albuminate of silver, &c., do exist at all, and whether they are not rather the mere imagination of some chemical brain: that such do exist I think can be easily proved. It was only at the close of the last session of this society, that we were all startled by a gentleman, well known as a manufacturer of first-class chemicals (Mr. Williams), announcing that in distilling the residues of old collodion he had found a large quantity of oxalic acid, most likely in the state of an alkaline oxalate, which he separated by decomposing into oxalate of lime; but our wonder will cease when we reflect that all the organic radicles, such as amide, oxamide, acetyle, &c., consists of carbon, oxygen, and hydrogen, which we have in pyroxyline, with the addition of nitrogen also, and which are liable to be found on the decomposition of the unstable materials of which collodion is composed. A case in point will illustrate the part an organic element can take in a process. In a portrait establishment where I was lately at work, we endeavoured to obtain greater intensity on plates developed with iron, by coating the plate previously with albumen, by the plan of Mr. Law. At first it did not promise much success; but after a few days we were surprised to find a very great increase of intensity, fully equal to that obtained by pyrogallic acid: in a few days after the bath caused fogging all over the plate, and a new one was prepared, when the result was precisely as before, the intensity only appearing after the bath had been in use some days. Happening to run short of coated plates, an uncoated one was used, when the result was equally good: it then struck us that it must have been the albumen in the bath which caused the effect; and to prove this, a new bath was prepared, having the white of an egg beaten up with the water of which the bath was made. This answered admirably, and some beautiful pictures were taken; but the bath so rapidly produced "fogging," that it was obliged to be given up, though with regret.

There is thus no doubt of the action of these organic elements, viz., that they not only play the part of acids and form salts, but also double salts with the iodides, bromides, &c., of silver. The study of the exact nature of collodion and its decomposition affords a fine field for the experimental chemist, but it requires intense

perseverance; for when we think we have grasped a point, dozens of others start up, and what we think and hope is the end of our labours is in truth but the beginning.

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

By "fixing" a photographic proof is understood the means of rendering it unchangeable in appearance and condition. To arrive at this result, the proof, upon being taken out of the pressure-frame, is submitted to the action of various solutions, which resemble each other in the dissolving action they exercise upon the argentine compounds insoluble in water, which constitute the sensitive coating.

This operation is accompanied with three different kinds of phenomena: the non-impressed parts of the proof, which if exposed to light would become quickly darkened, acquire the property of remaining colourless; a change of colour always takes place in the proof, and the intensity of the tones of the proof is frequently weakened.

From these three points of view the fixing, to be perfect, should present clear and definite qualities.

1st. The fixing agent must remove from the paper all the sensitive substance that has not been acted upon by light, so that the subsequent action of light cannot modify the effect obtained.

2nd. It must not leave upon the proof any substance capable of acting either immediately or subsequently on the substances of which it is composed, or of altering their various proportions.

3rd. It must exercise no action upon the colourless portions; or, at least, if it attacks the coloured parts it must do so only very feebly, and preserve all the delicacy of the half-tones.

A small number of substances are successfully employed with this object; the value of each under these three points of view will be examined in succession, after endeavouring first to establish the theory of fixing itself.

Theory of Fixing.—When a proof is removed, after exposure, from the printing-frame, it usually appears covered with rich purple and violet tones, formed of different substances, the nature of which has previously been made known. They are—free chloride of silver, free nitrate of silver in excess, upon which the light has not acted, and which consequently does not belong to the coloured parts of the proof. There is also metallic silver, and also that argento-organic compound of variable colours the influence of which is so great in the production of a proof.

The different nature of these four substances causes them to play very different parts when submitted to the different fixing agents. The first two undergo, under the influence of these agents, certain actions, the nature of which will be explained, but which ultimately result in a complete solution. Chemists are all agreed upon this point: the fixing agents remove the unchanged salts of silver. But there is not the same harmony of opinion as to the parts the fixing agents play in connection with the coloured portions of the proof. This disagreement may be easily explained.

The operation of "fixing" is in fact accompanied by a remarkable fact well known to all photographers. At the moment the proof is immersed in the fixing solution, whatever it may be, it is quickly deprived of its violet tint, which is changed into a brick-red colour or an orange-red, varying according to the fixing agent; but all differing clearly and strikingly from the original tint of the proof.

Various theories have been proposed to explain the nature of this change. The first is, that the proof is formed of sub-chloride of silver, Ag^2 Cl., which the fixing agent decomposes, and transforms partly into soluble chloride of silver, and partly into metallic silver which forms the proof. This theory is not tenable; for we find on the one hand that the positive proof does not contain sub-chloride of silver, while on the other it appears difficult to admit that the metallic silver precipitated can vary, not in the quality of its tones, but even in their nature.

When it was understood that, among the organic matters constituting the sheet of paper or its coating, there was one which influenced the result, a basis for ingenious theories was sought for in the modification it experienced; but they were not confirmed by experiment.

By some it was thought that the fixing agent decomposed the sub-chloride of silver, setting the silver free, and thus uniting with the organic matter formed the coloured combination comprising the proof. This modification of the first theory is no more admissible than the theory itself. For, 1st, there is no sub-chloride of silver on the proof. 2nd. The argento-organic combination exists before the fixing agent has intervened, when the light alone has acted. In fact, the coloured precipitate formed under the influence of the luminous action in a solution containing chloride of silver, nitrate of silver, starch, or gelatine, contains the organic matter insolubilised even before it is submitted to the action of any re-agent whatever.

Others say that the argento-organic combination exists before the action of the fixing agent; for according to the nature and strength of the sizing, so will be the colour of the proofs when removed from the printing-frame; but under the influence of the fixing agent the combination is destroyed, and metallic silver is set free. Like the other two theories, this also is incorrect; for, as we have shown, the argento-organic combination ***still exists after the action of the fixing agent;*** for the precipitate, fixed and well washed, still contains organic matter. On the other hand, the proof taken upon unsized paper, containing only metallic silver, is *grey* after it is fixed, and not *red*, as it would be if the silver was in presence of sizing. Therefore the organic matter exists in combination with the silver.

These theories, therefore, do not really explain the marked change of tint which characterises the action of the fixing agent. We must seek the explanation of this phenomenon in quite a different direction.

When we consider that if the image consists of metallic silver, the latter serves only as a canvas or support to the picture, and constitutes as it were a flat tint, upon which the argento-organic material groups itself in vigourous coloured tones, we are led to seek in a modification of the latter the cause of the change in tint produced by the fixing agent. Now, if we consider the nature of the fixing agents employed—hyposulphite of soda, solution of ammonia, cyanide of potassium, &c.—we remark that they all possess an alkaline reaction. We also know that the alkalies have the property of making the various substances employed in sizing swell up, or hydrating: this is particularly the case with starch. Starting from this point, we are led to think that from the moment of immersion in the fixing solution the latter exercises an alkaline reaction upon the sizing, making it to swell, and causing the argento-organic combination already formed by the action of light to undergo a hydration which energetically alters its colour. It is understood that a chemical hydration, and not merely a moistening, takes place; for the new compound thus formed possesses a peculiar colour, which is not changed by drying.

If this hypothesis be correct it can easily be proved. It is easy to find in steam from boiling water a substance which, incapable of effecting any chemical change upon the salts present, nevertheless can exercise the same action upon the sizing as an alkali, in causing it to swell. Upon exposing to the steam of boiling water a violet proof taken upon paper sized with starch, we see it instantly take the red tint which it acquires when immersed in a solution of hyposulphite of soda or of ammonia. Plunged into boiling water it experiences the same change; but immersed in cold water it undergoes no sensible alteration, for cold water does not cause starch to swell much.

Experience proves the truth of these facts. A proof taken upon paper sized with starch does not change much in tone when taken out of the frame and immersed in cold water; but it immediately assumes a red tone if it is plunged in boiling water, or simply exposed to its steam.

This theory is also confirmed by many observations. If the starch becomes hydrated only under the influence of warm water, gelatine we know is at length hydrated under the influence of cold water. Proofs taken upon English papers which are sized with gelatine become red when left for some time in cold water. Gelatine therefore plays the same part with cold water that starch does with hot.

Besides, we are satisfied that all the salts that have a feeble alkaline reaction, such as phosphate of soda, borax, &c., act in the same manner as the ordinary fixing agents, but with much less energy.

From the facts stated the theory of *fixing* is established in a manner that assures us of its correctness and certainty. The fixing agent dissolves and removes the silver salts, chlorides or nitrates, which are in excess on the paper. It exercises no action upon the metallic silver, if employed in what we may call a normal manner, that is, during a time and in a state of concentration that none of the accessory reactions we shall describe hereafter can take place. Lastly, under an alkaline influence it causes a prompt change of tint of the sizing, due to hydration, and consequently of the combination the latter forms with the silver.

A direct experiment will clearly show in what manner the argento-organic matter swells, hydrated under the influence of the alkalies. If we collect the matter deposited by a mixture of chloride and nitrate of silver dissolved in solution of starch, and if after being fixed it is left to become reduced by dessication in the open air to an elastic metalloid material, and mix it with any fixing agent, we see it increase in bulk, becoming at least double in volume, while at the same time its tint is modified. Hydrated for the first time by the fixing, this material was partially dried; but the second contact of the fixing agent made it resume its swelled state.

(To be concluded in our next.)

THE POSITIVE COLLODION PROCESS, WITH SOME REMARKS ON THE ALABASTRINE PROCESS.

By G. Wharton Simpson.

(Concluded from our last number.)

FIXING THE IMAGE,

As it is generally called, or removing the unaltered iodide of silver, is better effected, in the positive process, by means of cyanide of potassium than by hyposulphite of soda, as there is sometimes danger of the picture acquiring a brown tone from sulphur, when the latter is used. Cyanide of potassium is also more soluble, and consequently more easily removed by washing, than hyposulphite of soda. The strength is somewhat unimportant, provided that its action is not so rapid as to attack the half-tones of the picture before it can be rinsed from the surface. From five to ten grains to the ounce of water will generally be sufficient to remove the iodide in ten or fifteen seconds.

After a thorough rinsing, I prefer to dry the picture by the aid of heat. Not only is it more quickly out of harm's way from dust, &c., but in many cases, I am disposed to think, the tone is better than when left to dry spontaneously.

The picture is now completed, and ready for such finish, by backing, varnishing, colouring, &c., as may be determined on.

In regard to backing, as a general rule I object to black varnish for the purpose, as it most frequently very much degrades the tone of a picture, one of the chief faults of which is that it is already too low in tone, certainly lower in tone than any other class of picture. It generally renders the whites grey, lessens the transparency of the shadows, and detracts largely from any atmospheric effect there may be in the background. Velvet, either black or of some dark colour, such as maroon, I prefer. There are cases in which black varnish may be used to gain additional depth on some parts of the picture, using velvet for the remainder. If black varnish be used, it should never be applied to the collodion film: where that is done, I regard the picture as ruined.

In regard to the kind of transparent varnish to be used on the collodion film it is much a matter of taste. To the majority of those heavy-bodied varnishes which coat the picture with a thick glazy layer of gum I have personally a great distaste. Even when freshly applied they lower the whites; and when, as is universally the case, the gum has become yellow with age, the pictures, especially if uncoloured, present a sorry sight. I prefer a light-bodied varnish, which, whilst enriching and giving transparency to the blacks, leaves the whites almost, if not entirely, as dead and white as before varnishing. In any case, I think it wise to select a good varnish made by a person whose business it is to manufacture such things. Amateur varnish-making I regard as a great mistake.

In regard to colouring collodion positives, tastes differ. For portraiture — and collodion positives are rarely used for other purposes — I think the presence of colour little short of a necessity; and the application of *good* powder colours with anything like skill often converts a ghastly, repulsive effigy into a life-like satisfactory portrait. The colours should, however, be good, and some judgment and skill used in their application, otherwise that which was simply unattractive becomes disgusting.

I should have liked to have said something of the management of light, position, &c.; but as these appertain to the more extended question of portraiture generally, and belong in no particular sense to the positive process, I must not enlarge on the subject. I will simply refer to the advantages, in regard to artistic effect, to be gained in lighting the figure by one principal light, and not by the diffused light of a glass-house all round the figure. I prefer to have one side of the figure in shadow, regulating the amount of reflective light by the position of a white screen. The background, I think, should be quite plain, without objects of any kind introduced. This, if necessary, can be best done in colouring. A white background should be carefully avoided, as well as one too dark. A screen coloured in distemper with a mixture of black and white, or brown umber and white, gives an excellent background. If it be preferred, a light near the head of the sitter may be introduced on the backgrouud, and, if properly managed, gives relief and atmosphere to the picture.

THE ALABASTRINE PROCESS.

I must now say a few words on the alabastrine process; but as the manufacture of the preparations used involve a trade secret, in the maintenance of which there are other interests than my own, I must not enter into the subject. My remarks must, therefore, be brief, as I regard it as a violation of the privileges of meetings of this kind to make use of them for trade purposes. I will briefly refer to the characteristics of the pictures, and to the manipulatory details of production. In the meantime, I hand for inspection specimens, uncoloured, coloured, and coloured as non-inverted coloured positives.

A vigorous good positive having been produced, slightly under rather than over-exposed—I prefer the first-named of the developers, already mentioned, for the purpose — the picture, after fixing, must be very thoroughly washed, and sufficient of the alabastrine redeveloping solution to cover it is then poured over the picture. It is then placed on a levelling stand and left for a sufficient time, which may be from a quarter of an hour to an hour, depending upon the class of picture and the temperature. Its completion is determined by the whites of the picture having obtained their utmost purity. There is not much danger of the solution remaining too long; but there is danger in removing it too soon. In that case, not only is the full beauty not obtained, but there is also a danger of subsequent discolouration.

I may here remark that I remember your excellent chairman, in a very kind notice of a little work of mine—"The Photographic Teacher"—took exception to the phrase "redeveloping solution." That name was given really to express the idea of further development, as in many cases latent detail, before invisible, is rendered with beautiful delicacy by the action of the alabastrine solution.

The picture having attained its greatest vigour, is to be thoroughly washed and dried, it is then ready to receive the varnish prepared for the purpose, which gives richness, depth, and transparency to the shadows without in any degree lowering or impairing the whites.

The chief distinction in result between the alabastrine process and the simple process of bleaching by the bichloride of mercury, which latter some persons are in the habit of confounding with the former, is the absence in the former of the blue coldness which is the general characteristic of pictures bleached by the latter means; and the production in its place of pure whites combined with great vigour and relief.

An important feature of pictures produced by the alabastrine process is the facility with which they receive powder colours, and the brilliant effect which may consequently be produced on pictures of such pure tone. Another important feature is the permeability of the film, presenting the facility for producing non-inverted coloured pictures. In these photographs the powder colours being applied on the surface in the usual way are by the application of a "penetrating varnish" made to permeate the film, thus suffusing it with colour. The picture then may be viewed on the side opposite the film, presenting a brilliantly-coloured non-inverted picture, much resembling an enamel painting. It is a peculiarity of these pictures that, although varnished with a "penetrating varnish" which is a strong-bodied protective varnish, they are in no injurious degree lowered by it, or made blue, as is the case generally with bichloride of mercury-bleached pictures when varnished. Regarding their merits I will venture to quote a few lines from an interesting article in the *Art Journal* for August last — "Many of the portraits we have examined," observes the writer, "have displayed in a striking manner the correctness of this principle of colouring the photographic portrait. With all the exquisite finish of the most perfect ivory miniature, *these* portraits possess a perfection which *those* could never reach. The delicate pencil of the sunbeam has drawn with unerring fidelity lines which no artist could describe with his pencil, consequently the texture of every part of the dress, the condition even of the skin, and the physical state of 'each particular hair' remain preserved so as to bear very high magnifying power, whilst the brilliancy of colour is given to the whole. An effect is obtained in a few hours upon these photographs which could not be reached by days of the most laborious application on ivory."

In reference to permanency, on which some question has been raised, I may remark that many of the pictures now before you have been taken nearly three years, and some of them have stood for months in my rooms, without even the protection of glass or covering of any kind, without the slightest deterioration. Properly manipulated, with proper material, I believe they are quite permanent. Without this, no photograph is permanent.

I will conclude by observing that the specimens now in your hands are coloured with Newman's photographic colours, which I have always found best either for alabastrine pictures or ordinary positives.

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

MR. WILSON'S SCOTTISH GEMS.

(Concluded from page 7.)

We now pass to another class of views, a series for which we venture to predict a world-wide reputation, containing some of the richest gems of Scottish scenery.

The Trossachs and Ben Venue from above the Inn (No. 24) is one of those sweet calm spots which needs only to be seen to make an indelible impression on the memory. The still waters of the lake, with its fringe of rich foliage, backed by the rugged side of the mountain, and the picturesque bit of building in the foreground, seen from between the branches of a couple of noble trees, form altogether a most agreeable composition. This is a fit precursor to another scene at the Trossachs —

The Pass of Beal-ach-nam-bo, where we get more closely face to face with the bold, dark, broken, rocky side of the lofty hills, washed at the base by the waters of the lake, which reflect the grim outlines with a softened resemblance, while some silver birch trees on the right of the spectator partially veil them.

The Upper Falls of Foynes, Invernesshire. — This is a scene of magnificent rugged grandeur; tall, grotesquely-formed rocks reaching to the top of the slide are united by a single arch of brickwork. From between the crevices in the upper parts of the rock there spring some graceful ferns and straggling creepers; through the central opening is seen another mass of rock, over which, in a single steady stream, there flows the water of a mountain rivulet, which eddies around the projecting masses of stone, wearing away and undercutting their bases. In the immediate foreground an artist is seated sketching, while an attendant is looking over his shoulder, watching the progress of the work.

Upper Fall on the Giaw-valt, Braemar. — It would not be easy to select a more perfect contrast to the preceding, amongst the same class of subjects, than the one now under consideration. Here the fall is split and broken into numerous streamlets, which glide gently down the slopes of the rounded and well-worn stones in the bed of the river. This also is spanned by a bridge; but how different to the last! this being a rustic wooden structure, whilst both banks of the stream are richly clothed with masses of vigorous fir-trees growing in wild luxuriance.

We cannot take leave of the falls without a word or two more relative to three casually noticed in our last, viz. —

The Upper, Second, and Lower Falls of Moness, Aberfeldy, which, for beauty of subject and perfection of execution, cannot be surpassed, the utmost amount of detail being united with a delicate softness yet brilliancy of effect. They are perfect *pictures* of the highest class, comprising the most harmonious union of rocks, water, foliage, and above all, *atmosphere*. We give up, in despair, the hope of describing adequately these *gems of beauty*, for such they truly are.

Fingal's Cave, Staffa. — The celebrity of this picturesque cavern would alone insure a large demand for a good illustration of it; but even if it were altogether unknown, such an one as we have before us would, of itself, be enough to render it celebrated henceforth. The cave hollowed out of the basaltic rock by the restless action of the mighty waters of the ocean, presents to the eye much more the aspect of a work of art than one of nature. The sides are formed of prismatic pillars of basalt, arranged with much regularity, while the angular peaked roof, about one hundred feet high, is composed, partly of the bases of truncated pillars, and partly of amorphous trap. The sea washes into the cave, which is between three hundred and four hundred feet in depth, though it can be entered at one part on foot, the floor being composed of the sections of the pillar-tops. The rich, transparent shadows and general artistic execution of this subject are beyond all praise.

With a descripton of a few specimens of instantaneous photographs we shall close the present notice.

Prince's Street, Edinburgh, taken from just below the Sun Fire and Life Office, the spectator looking towards the Calton Hill, presents a stirring scene of activity. It is high noon-day, the pavement is thronged with pedestrians, and the roadway with vehicles in motion, while a volume of steam from the railway station, between the old and new towns, indicates that a train is upon the point of starting. Quickly as this subject must have been taken, there is a slight blurr visible in the nearest figures, owing to their being in rapid motion, but how infinitely superior to those "cities of the dead" with which we have hitherto been compelled to content ourselves.

The Breaking Wave. — The title bespeaks the subject. A low sandy shore, and a somewhat smooth sea, relieved by the wave in the act of toppling over, and three little urchins, with trousers tucked above the knee, dabbling in the shallow water. Here again the introduction of the figures is of incalculable benefit, in an artistic point of view; for the sea itself is not so striking and satisfactory *alone* as the specimens produced by Mr. Samuel Fry, of Brighton, which we noticed in these pages some time back; but, as *compositions*, Mr. Wilson's work excels. The manner in which the light on the water throws up the figures of the boys is remarkably effective.

The Victoria Steamer.—This view is taken at low tide. A calm sea and cloudless sky are broken up by the steamer leaving a long trail of black smoke behind as she speeds on her way towards Peterhead. Riding at anchor, under bare poles, is a brigantine. A long stretch of dry sand, with a hollow patch still wet, is studded here and there with masses of sea-weed, and indented by many a foot track, whilst towards the edge of the waves are seen numerous figures, chiefly boys, watching the progress of the vessel.

Aberdeen Harbour, Twilight, is a fitting subject with which to close our somewhat voluminous remarks. The dark hulls of the vessels moored in tiers contrast with the sharp tracery of the spars and rigging, which show strongly against a sky traversed by clouds portentous of windy weather. The sun has sunk below the horizon, but still tinges with a fringe of gold the edge of a long low purple cloud that Millais would delight in painting. A scarcely perceptible ripple stirs the surface of the water, and the houses of the city are almost lost in the shadows of evening. While we watch this slide, we almost fancy we hear the "good night" of those departing towards home to rest.

It is seldom, if ever, we have before seen a collection like the one we have been endeavouring to describe, possessing so uniform an excellence of equally elevated a grade. Mr. Wilson is an artist in the fullest sense of the word, and infuses his spirit into all his productions. In conclusion, we have only to say, that the printing and general getting up of these stereographs are worthy of the execution of the negatives. Their wide diffusion will carry a gleam of sunshine into many a home.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. XII.

Leaving Tyre in the morning, we rode on with our friends, passing Sarepta without pausing, until we reached the shore near Sidon, and here we parted from them, they going on to Beyrout to rejoin the steamer, we pausing to turn eastward into the holy land of Galilee. Hassan met us here with the tents. I wandered in the forenoon through Sidon, making a few purchases in the miserable little shops, and sat on the seashore, near our tents, all the afternoon, recalling the usual subjects of thought in such places, the illustrations of fulfilled prophecy.

I defy any man to go through Palestine with his Bible in his hand and not believe that the men who wrote these predictions, which no one can doubt were written centuries ago, were inspired of God —that Ezekiel spoke the voice of the Almighty when he said, "Behold I am against thee, O Sidon."

Of the ancient glory of the city of purple nothing remains. Along the coast, here and there, are broken tombs, masses of undefinable ruins, the solemn monuments of the accomplishment of God's intent against the city of the sea. Within the city is like all others that I have seen or described. It would but weary you to repeat the story of narrow streets, filthy bazaars, crowding Arabs, Druses, Moslems, and Christians. Perhaps the pleasantest feature of the city is the American Mission here established. I called on the resident missionaries, and was deeply impressed with their vast pre-eminence as sensible, labouring men, over the missionaries of all other nations I have seen. The English mission to the Jews in Jerusalem is—with all deference to the Lord Bishop—a humbug. It is a waste of money, labour, and intellect. On the

contrary, the American missions in the north of Syria are accomplishing wonders; and the reason for the difference is simply this—that the Americans are men of common sense, who take hold of the people in a frank and intelligent manner. They gain their confidence, teach them to regard them as friends, show them that they are the pioneers of civilisation, art, and science; and if they do not convert them, they at least stand in a position to take advantage of the political changes in the East, which all know are inevitable, sooner or later.

Toward evening I walked out into a great cemetery of the Moslems. Miserable, melancholy fields these Moslem burial-places are. But the most melancholy scenes in them are the mourning groups of women. I saw half-a-dozen of them, some here, some there, uttering those loud cries of sorrow which, in the streets and the houses, may seem mere noisy demonstrations of grief, but which have special signification in the place of graves. There was one woman here that I feared would die, so fierce was her grief.

God knows she had reason for it. The widow of a Mahommedan who has loved her husband, hopeless of meeting him ever again, forced to believe him in the embraces of the houries, within whose arms he has forgotten her, may well be inconsolable. As I approached to where she knelt, she spat towards me with a curse, then wailed aloud once more. The air rang with the cry as she threw herself down on the tomb in which her husband lay, as she had left him to be questioned by the angels. They bury their dead with open space in the grave above their heads, so that they can sit up when the angel comes; and believing that they suffer torment from the moment of death till this examination is over, they hasten the ceremony of burial, so that it always follows death in a very few hours.

As I came out of the cemetery I met a well-dressed man, attended by half-a-dozen officers, who walked directly towards me. I have not yet found out who he was, whether the resident governor or only the sheik of the village. In the party, however, was a miserable-looking fellah, a common man of the country, who was evidently labouring under strong suspicion of deserving a thrashing.

The party approached me, and the chief advanced with a respectful salutation. I returned it, and through his interpreter assured him of my profound sense of his grandeur.

He assured me of my alliance with all the Sultans of the earth. I enlightened him on the magnificence of his own ancestry.

In short, we bowed and exchanged the usual salutations, and he then proceeded to business.

This poor fellah had been caught, having in his possession a silk handkerchief, which it was suspected he had stolen from my tents. A glance at it showed me that it was John's, and he must have lost it as he rode through the town. A few inquiries satisfied me that it had been taken from him as he sat in the bazaars a few moments.

The culprit looked imploringly at me, and at length got down on his knees, and began to kiss my hands demonstratively. I obtained leave of the officer in charge to punish him as I saw fit, and he sent him down to the tents with me, where John and myself held a consultation what to do with him. Hassan recommended hanging. Hassan thinks stealing from an Howajii the blackest of crimes. Achmed, the cook, recommended the rope on his other extremity—to wit, a rapping on the soles of his feet. I detest the bastinado. John proposed to the fellow (fellah?) a chance for his life, and frighten him.

So I ordered Hassan to bring out my camera, and mount it on its tripod, which was done with due ceremony. The culprit was then tied in a chair, placed at about ten feet distance, directly opposite the lens. The poor wretch rolled his eyes in an agony of fear, his hair literally stood on end, and the perspiration rolled down his face in streams. Yellow skinned as the knave was, he was fast turning white. He evidently expected a four-pound ball through his body. I went through the necessary operations of focussing the distant landscape, leaving the culprit out of the picture altogether. With my head buried under the focussing cloth, I must, of a certainty, have been an object of terror to the uninitiated oriental; but Hassan's eye twinkled knowingly, and he performed his movements with ludicrious solemnity. When all was ready, I directed him to remove the cap, keeping my eye on the culprit. He knew the crisis was come: closing his eyes he sputtered out some foam, and kicked and wriggled to such a degree that he toppled over, chair and all, at the moment John fired his revolver in the air.

I thought the fellah had died of fright; he lay as motionless as if dead. We let him lie for about five minutes, when Hassan crept stealthily behind him, and gave him a monitory kick behind. He would have risen up, had he not been encumbered by the chair. At a sign from John, Hassan loosened the cords, set the fellow on his legs again, and told him to be off, and that if he was caught his ears would surely be cut from his head. Giving him a hundred yards start, we raised something of a war-whoop. He started like a deer. I think it probable he is running yet. The last we saw of him he was on his way to Tyre at a flying gallop, and if he kept on at that rate he must be near to Jaffa by this time.

Hassan had heard something at Demetri's Hotel, in Beyrout, about letters for us, but he could not find any. Indeed no banker would deliver them to him if there were any; but we thought it worth a day's gallop to run the chance of getting them, and so the next day we rode up to Beyrout; but we found no letters, and returned in the afternoon, expecting to reach Sarepta, and find our letters there.

We had directed our men to Sidon in the forenoon, but they had found pleasanter occupation, so that when we returned to our camp, they had but just left, and we overtook them in an hour. The night was coming on. It was manifest we should not reach Sarepta as we had anticipated, and we ordered them to halt on a slope close to the sea. Here we sat and shivered while dinner was prepared. John was in an ill-humour: I in no better. Food improved us a little. Coffee soothed the waters of our troubled minds as if it were oil, and tobacco did the rest. By nine o'clock we were in a glorious condition, and then we sung.

How we did sing! Hassan and his men looked in with consternation and horror, thinking the Pashas had gone mad. What do they know of music, poor rogues? They sometimes drone a long song or story, in a monotonous strain, but when they hear a rattling, roaring song, they dont understand it at all.

Perhaps you have heard the "Postillion" song. Perhaps you have sung it. Well, sir, we sung it; and we sung "Come, landlord, fill," and John sang "Lucy Neal," and we sung many other songs along the coast of Tyre and Sidon that night. Finally, John took up the "Piff-Paft" song of the old covenanter from Meyerbeer's *Huguenots*, and gave it in a rare style. The transition from this to Luther's grand chorale was but natural, and then, as the night wore on, we sung more quiet songs; took to hymns, in fact—dear old hymns!—to which the Holy Land was not uncongenial, which might make the atmosphere of Galilee more delicious and more glorious. Some of these old hymns are very stirring and grand, and we made the hill back of the tents echo to our hallelujahs. Then came—but why tell you what we sung? You know those dear old hymns, which voices have sung which now form part of the choir of the heavenly host.

The wind came down from Lebanon to hear us, and the sea broke on the beach with a low deep melody, in unison with our thoughts and feelings; and then we lay back on our camp beds and slept.

I give you this as a sketch of our usual evenings in the tents. Sometimes we are pretty well tired out, and sleep instantly after dinner; but generally we talk a little, and laugh a little, and sing a little. I cannot say that we do often sing quite so uproariously as on that evening.

I have taken some very interesting views in this neighbourhood of Tyre, and Sidon, and of Akra (St. Jean d'Acre). I wish I could send some proofs to you; but I must wait till I meet a traveller returning to England, and who will take trusty charge of a small portfolio.

D. T.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of the above society was held on Tuesday, the 7th instant. Roger Fenton, Esq., Vice-President, occupied the chair.

The minutes of the last meeting were read and confirmed.

The Right Hon. the Earl of Caithness, and Messrs. Robinson and Carrick, were duly elected members of the society.

The Chairman reminded the members that this was the night for the nomination and election of auditors, and to nominate for the council in opposition to those names recommended by the present council.

Mr. Crace proposed and Mr. Bedford seconded the motion, which was duly put and carried, that Vernon Heath, Esq., and John Major, Esq., do act as auditors.

The Secretary read a letter from M. Joubert, stating his inability to attend the meeting, and his pleasure at sending a few impressions of the intended print for the society's Journal, stating also that the want of light lately has prevented his proceeding as fast as he could have wished.

The Chairman called attention to one of the specimens.

A Member asked what was the nature of the process, and what it was called.

The Secretary stated that the proof was from an untouched photographic negative; that it was executed in printer's ink, and considered indestructible. M. Joubert had called it the Phototype, and did not intend to patent his process, but purposed opening a printing establishment, and afterwards to give the details of the process to the public.

The Chairman announced that after the conclusion of the ordinary business at the ensuing annual meeting in February, if there shall be time, the Collodion Committee intended bringing forward its report.

Messrs. Murray and Heath exhibited a *Smartt's Photographic Tent*, for the purpose of explaining the improvements that have been made in it. Mr. Heath gave the following

Description of the Improvements in Smartt's Tent.

This tent is now so well known and extensively used, that it is not necessary that I should occupy the time of the meeting by explaining the principle of its construction.

My object is this—The experience that has been gained by the manufacture of the large number of these tents that have gone into use, has originated several minor improvements, alterations, and additions.

These, with your permission, I will now explain:—

1st—As to the table (for the frame-work of the tent remains much as at first designed), originally two grooved pieces were used, which, being fitted on to the ends of the table, rendered it rigid; the operation of doing this was, however, found to be rather troublesome, especially if the table had been packed up when wet by use. The two pieces I hold in my hand were substituted for the grooved-end pieces, and by this change the table is not merely increased in strength, but is much more quickly and easily put up.

Further—In the old form of table, a hole was cut of sufficient size for the insertion of an indian-rubber-cloth sink: this, while it weakened the table, made it difficult to use a developing stand. This leads me to the 2nd point, viz.—the new developing tray—an arrangement which, I venture to say, is worthy the attention and examination of photographers, on account of its efficiency and portability. It will be observed that it is made of indian-rubber cloth. has two of its sides fixed and rigid, and its two ends moveable; thus it folds up into a space little larger than one of its sides.

I will now fix the table in its place on the frame of the tent, and will merely remark, that nothing can be desired firmer and more rigid than the whole arrangement has now become.

My 3rd point is the economy of the working space of the table. A portion of it is, of course, occupied by the tray I have just described. The nitrate bath, which is one of our new glass baths, with glass tight top, is suspended from the front of the table, and rests upon a portion of the framework of the tent. By this means the space it would occupy if placed on the table, is reserved.

A contrivance was then devised for disposing of the plate slide of the camera, in order to gain the space it required, if placed on the table. This contrivance is simple and effective, and can be used for slides for various sizes, for which it provides a safe and convenient place, both before and after the exposure in the camera.

The disposal, as thus explained, of the bath and plate-holder, leaves ample space on the table for manipulating the largest-sized plates.

The collodion pourer, the developing-plateholder, the developing cups, and the water-bottle (the latter is suspended over the tray as now placed), have all special points in construction; these I will not take up your time by explaining, as they will be best understood by examination.

Nor need I describe the cover of the tent, as it will easily be imagined how this is put over the framework, and how the operator can close himself within it.

I may, however, say that it is provided with a ventilator, yellow window, pockets for cloths, and an entrance, formed for the purpose of being light-tight, like a double curtain.

This, then, is Smartt's tent in its present state; and I may remark that, having had considerable experience in its use, I consider it very successful; indeed, I believe it merely just to say that Mr. Smartt has the honour of having designed the most useful and effective tent yet made. This is so constantly confirmed by the letters of those who have them in use, that I do not hesitate to speak of its merits in the terms I have.

I will ask, in conclusion, permission to mention a circumstance, which, on the one hand, is confirmatory of the merits of the tent, and on the other, is personally very gratifying to myself. Messrs. Negretti and Zambra, some months ago, sent out with their photographer to China and Japan one of these tents; and only last night (this gentleman desiring to extend his operations), they sent off a second one. Now, I argue, that this, coming as it does from a house manufacturing so extensively their own apparatus and contrivances, is as high testimony in its favour as can be desired.

The Chairman thanked Mr. Heath for his explanation, and called upon Mr. Hardwich to read his paper.

Mr. Hardwich then read a paper entitled—*On Collodion for the Dry Processes.* [See page 17.]

At its conclusion, Mr. Hardwich stated that he had brought two test tubes to the meeting, with which he would demonstrate one of the facts noticed in his paper. It had struck him as a curious circumstance, that on adding nitrate of silver in solution to one of gelatine, which necessarily contained chlorides, being boiled down from hoofs and such-like animal substances, no precipitate of chloride of silver occurred, at any rate for some time, though a slight cloudiness might be perceived; but upon the addition of nitric acid, and the boiling of the whole, the chloride of silver was thrown down. He then exhibited the experiment, and stated that the chloride was never thrown down from the solution in gelatine, in the *same state* as when precipitated from the solution without gelatine; it appeared to be excessively finely divided, and would not settle at the bottom, but remained suspended even for twenty-four hours.

The Chairman then invited discussion upon the paper, and drew attention to about twenty large negatives of Mr. Barnes's, by the dry collodion process, with various modifications, some having preservative substances superposed on the collodion, and others used with them as a substratum on the collodion. Unfortunately Mr. Barnes was not able to be present at the meeting, but that gentleman had attached to each negative a written description of the different media employed.

Mr. Sebastian Davis was sure the meeting was indebted to Mr. Hardwich for the not merely scientific but rational and interesting manner in which he had brought forward the subject of the dry process. Mr. Davis then detailed some experiments he himself had made. He had dipped Swedish blotting-paper into a solution of *nitric acid* of s.g. 1·42, and subsequently converted it into pyroxyline: he then dissolved it in one measure of alcohol to two measures of ether; he found that it dissolved readily, and produced a film of an extremely film-like character, the very opposite to that which Mr. Hardwich had obtained of the powdery kind. He thought Mr. Hardwich had not clearly proved by the experiment he had made that sulphuric acid had the same effect upon cotton wool that it had upon paper: he said he dipped paper into sulphuric acid, and converted it into pyroxyline in one case of the tough, and in the other case of the porous kind. There was a difference between the cellulose as paper and the same as cotton wool. If the action of sulphuric acid be continued upon it at a certain temperature, it converted the cellulose into dextrine, and if continued further, into grape sugar. He thought it was still a question whether collodion of a porous character was by any means so sensitive for dry processes as one of a tougher texture.

The real principle of preparing a dry plate for taking a picture required that the developing fluid should be able to penetrate the film. Under ordinary circumstances if we take a plate with a sensitised collodion film upon it, and wash it, it will be so hardened upon drying that the developer will not penetrate into its pores. It is requisite, then, before drying the plate, to apply some substance, soluble in water, so that when the developer passes over the plate, it shall, by dissolving the preservative material, enter into the body and substance of the film, and so produce the desired effect. In Fothergill's process Mr. Davis did not think that there was a difficulty in obtaining the requisite intensity which had been alleged, and Mr. Hardwich did not state in what way he reckoned the slowness in development, nor whether he compared the dry plate with those that were wet. If Mr. Hardwich compared it with the wet plate undoubtedly it developed slowly, but Mr. Davis thought it as quick in developing as any other dry process with which he was acquainted, and regarded moderately slow development rather as an advantage, for an inexperienced operator when developing in yellow light would be almost sure to over-develop a dry plate.

He (Mr. Davis) considered the Fothergill process to be based upon a truly rational principle—that of washing the plate free from nitrate of silver, and then applying some substance which will enter into the pores of the collodion, and be soluble in water. He must confess that he met with a difficulty in the Fothergill process which he had not been able to surmount, and which he should have had great hesitation in stating but that others had found the same difficulty—that was a marbled appearance of the skies. He had made various modifications in the preparations of the plates, but had invariably found that if he used a levelling stand, when developing, without keeping the plate in motion, those marks appeared; but if he kept the plate continually in motion, he avoided those marks, but sacrificed a portion of the beauty of half-tone which the negative would otherwise have possessed.

Mr. Eliot then read a paper on *Observations on the Nature of Various Kinds of Collodion.* [See page 20.]

Mr. Hughes, without taking up precisely the line of argument which Mr. Eliot had pursued and Mr. Davis commenced, would endeavour to call attention to the exact point, as far as it appeared upon the general practical point of the dry process. The society was indebted to Mr. Hardwich for devoting his philosophical attention to the subject at this time, when the variety of processes was so great as to become almost nauseating. He thought that involved in Mr. Hardwich's paper was this point, although Mr. Hardwich had not called special attention to it. Generally these preservative agents had been considered to serve the purpose of holding the plates capable of being restored to the same condition as in the wet process; but he thought Mr. Hardwich had shown that the preservative agents, innocent and inocuous as they had been supposed to be, had other very important chemical functions, which must now be studied in reference to their action when united with nitrate of silver, forming therewith new compounds which ultimately affect the picture. Mr. Hardwich had also called attention to the curious part which the chlorides and bromides play in the dry processes, in contradistinction to their action on the wet process, retarding the actinic action in the latter while assisting it in the former. Of this fact no explanation had as yet been attempted. It was now also proved that the very agents themselves, which were merely employed to act mechanically, really act chemically as well, and that even collodion itself, under certain conditions, possessed a chemical action apart from the bromides and the chlorides.

Mr. Malone stated that Mr. Hughes having spoken in the plural *(we)*, he rose to say that he did not consider the albumen, gelatine, &c., to act singly in preventing the condensation of the film to an impenetrable condition. He thought even apart from any functions they might play in combination with nitrate of silver, that preservative agents kept the film in a moist condition. If chloride of silver were precipitated from nitrate of silver in the ordinary manner, and then boiled while it was still moist with caustic potash, it would be very readily decomposed, but if it were allowed to dry, the act of drying would alter the physical aggregation of the particles, and would therefore not readily yield to the action of chemicals. With regard to the observations of Mr. Hardwich in the latter part of his paper, with reference to the combination of nitrate of silver with organic matters, the subject was not altogether new to him (Mr. Malone), and he should have felt bound to take some blame to himself for not introducing it before, but that he could not devote himself wholly to photography as Mr. Hardwich did. Mr. Fox Talbot informed him that, in making experiments with sheets of gelatine for negatives and positives, he found that by immersing the gelatine in nitrate of silver he could get the

nitrate to unite, so that he could dry it and subsequently procure a picture. In some of his experiments Mr. Talbot had purposely placed a surface of albumen on a weak solution of three grains of nitrate of silver to the ounce. The plates so coated were dried and then covered again with albumen, and subsequently coated with syrup of iodide of iron. The surface being thus prepared, the plate was finally immersed in nitrate of silver. There was therefore a surface of nitrate of silver with albumen below all, and to that day they did not know the functions of that particular layer of silver. That part of the subject was still mysterious, and required further investigation. He thought it was Mr. Fox Talbot who opened the door in that direction.

Mr. MALONE also stated that in 1851 he took up Mr. Talbot's experiments, and added to the white of egg (which every one knew contained common salt) some nitrate of silver, and got a precipitate which he stirred in the bulk of albumen, and found it to redissolve. Of course it became puzzling, and he did not know to this moment whether anybody had accounted for that. We call a substance gelatino-nitrate, and so on, but it was usual in examining chemical bodies and salts, before giving them names, to be able to separate them in a state of purity; and it happened, unfortunately, that a large class of metallic compounds with organic substances could not be recrystallised out. Here was an inherent difficuity, which might be overcome, but how to do so was the problem. Until the substance was so solved that it could be analysed and brought back again to its exact constituents, they could not give it a name. Sulphuric acid could be prevented from yielding a precipitate with baryta by addition of alchohol; and in this way we have the solution of sulphuric acid combined with the bases of alcohol and baryta salt, which does not give a precipitate or troubled appearance. This difficulty was well known to chemists in their ordinary operations, and this part of photography was a further exemplification of that difficulty. Another point to which he would direct attention was the influence of organic matter upon the resulting colour of the proof; and in that he thought Mr. Hardwich had done good service. Pyroxyline was not a substance, as far as he could judge at present, that he could precipitate in that definite form that he could oxide of silver and oxide of lead, and other substances. Pyroxyline contained other organic substances—the elements of cellulose, combined with a given quantity of hypo-nitric acid; but by adding potash we get rid of a portion of the hypo-nitric acid, and obtain nitrite of potash. As long as they proceeded in that manner, and produced compound things with such facility, he for one would say he could not see his way out of the difficulty. It was useless for any one to say this or that collodion was the best. We should deal very cautiously, and not attach undue importance to any new recipe or statement until the whole subject was properly sifted.

Mr. HUGHES stated that it was known previously that in the Taupenot process the preservative agent did play an important part.

Mr SHADBOLT stated that he differed from Mr. Hughes in his opinion that the *special novelty* of Mr. Hardwich's paper was the recognition of the fact that the compound of organic bodies with nitrate of silver played an important part in the dry process. The truth was that the first inkling of that fact was propounded at Manchester, by Mr. Young, when he found that it was possible to dissolve out the iodide of silver from an exposed plate *prior to the development of the image*, and subsequently develop it in the ordinary way, provided that albumen had been employed as a preservative agent—in fact, that he could get this image just as readily and quickly either by fixing first or developing first; but, supposing there had been no preservative agent used, and simply ordinary collodion, if he attempted to develop *after* the removal of the iodide from the wet plate he could not get any picture. The matter was also brought forward at the North London Photographic Association at the conclusion of last season—that is, somewhere about May or June—where it was discussed; and he thought that all who took part in the discussion came to the same conclusion—that is, that it was due to the presence of a compound of organic matter and silver in some form or other. He believed that at the same meeting Mr. Hannaford had pointed out that impressions were obtainable upon iodide of silver, provided any other silver salt were also present. The matter was therefore not so new as Mr. Hughes had supposed. He thought there was some error in Mr. Davis's supposition relative to the kind of collodion which was recommended by Mr. Hughes. He (Mr. S.) did not understand him to recommend the powedery film, but merely to have stated that it *had been recommended*, Mr Hardwich preferring the parchment-like or horny film, modified by the action of a free alkali, and consequently brought to the condition which enabled it to form a compound with the nitrate of silver.

Other gentlemen who had spoken had taken up the points upon which Mr. S. had made memoranda, he would therefore conclude.

Mr. CRACE would have been happy to have heard the opinions of those gentlemen who during the last season had practised the dry process in the camera. There were several specimens upon the table in which different processes had been adopted, but they emanated from one gentleman, and it would have been more satisfactory if different gentlemen had furnished the results of their experience. There was an aspect of the matter which he thought would be attended with advantage: if instead of first of all preparing an iodised film, and then using a silver bath, there might possibly be a form of preparation combining the silver bath with the preservative agent in one. He thought Mr. Lyte specially alluded to something like that. Surely that carried out successfully would be an important step in photography, and he should be glad to hear from Mr. Hardwich whether he thought there was any possibility of obtaining such a result.

Mr. SHADBOLT stated that that very question had been already answered by Mr. Mayall some years ago. The first dry collodion plates brought before us were by Mr. Mayall using a bath of nitrate of silver in which albumen had been previously placed.

The SECRETARY stated that Mr. Barnes, who was ill, had requested him to read the following:—"The principle of obtaining dry collodion pictures proposed by Mr. Hardwich is not the one I should now even think of following. The most economical way with reference to ease of manipulation, time occupied, &c., of producing prepared plates that may be relied upon is to proceed as follows:—To coat the glass in the first instance with as delicate a coating of albumen as it is possible to obtain, drying off rapidly by the fire; to employ collodion in its most perfect state, free from decomposition; the iodising solution to be that found to work best with the wet process. I give the preference certainly to iodide of potassium used alone and not in combination with any other iodide. The plate to be sensitised in the usual way, and thoroughly well washed to free it from every trace of nitrate of silver; then washed over with a mixture of equal parts of the albumen previously used, and of the ordinary pyrogallic developing solution, and finally dried. Plates thus prepared will be rapid in action, will bear any amount of washing, will not blister or crack during development or whilst drying off. Although I have produced satisfactory results by my method of working, the process is still open to improvements—the most essential being the lessening the time of exposure, the discovery of a means of obtaining power without the use of silver in the developing solutions, and of increasing the rapidity of the development. These improvements, however, depend upon experiments connected with the wet process. I may mention that I already obtain stereoscopic pictures in ten seconds on the average."

Mr. SHADBOLT thought that to Mr. Barnes was due a great deal more credit than was given to him, for he had been the first to produce a presentable dry plate. He also stated that if a plate were coated with a thin film of albumen, and dried—afterwards coated with collodion, sensitised, exposed, and developed, that the image would be found *on the film of albumen*, as could be proved by removing the whole of the collodion.

In answer to a question from Mr. S. Davis, as to the removal of the collodion, Mr. SHADBOLT said it was very easy to remove the collodion, by rubbing it with a little pledget of cotton dipped in alcohol, without injury to the albumen, because the latter is rendered insoluble by its immersion in nitrate of silver.

Mr. MALONE said that Mr. Fox Talbot found that his albumen film would bear rubbing with cotton wool thoroughly. It was most remarkable that in Mr. Shadbolt's case they had the first film of albumen, then collodion, then the plate dipped into nitrate of silver, which was still a return to the same fact observed in Mr. Talbot's case, for the nitrate of silver goes through the collodion, and acts on the albumen below, and the image goes through collodion, and so upon that film below. So with Mr. Talbot: he had used a film of albumen acted upon by nitrate of silver; over that he put iodide of iron, and then a second dose of nitrate; and still, in spite of that, the *upper* surface had not the permanent image, and was often smurred and dirty, and it was necessary to rub that off, and the real image was on the lower film. They found, when experimenting some long time since, that a bath that had been used for dipping albumenised plates for some weeks came afterwards to be used for the French paper process, and that paper, excited in the bath used for albumen plates, gave an image in dull weather in far less time than usual. There, again, was an action which was little expected. They should have supposed that it would have retarded it. But we never succeeded in purposely making a bath with that property, which showed that they had got a great deal of work to do in all directions; and it would now be desirable to try Mr. Barnes's plates, and dip them in albumen, and see whether it increased the rapidity of his process.

Mr. SHADBOLT drew attention to the fact that he saw some pictures at Glasgow, last year, produced by Mr. Kibble, of that city, with about a twentieth part of a second's exposure upon a dry film of large size, with a single achromatic lens of six feet focus.

Mr. WATSON did not agree with Mr. Hardwich, that either the iodide of silver or the image was upon the surface. In the instance cited by Mr. Hardwich in his paper, he thought it was imbedded in the collodion, and he would engage to produce from any kind of collodion a picture that could be rubbed off entirely from the surface, but that was not iodide of silver: he supposed the nearest approach in name would be an oxide, and that he had found especially to occur in the dry processes when using too much silver in order to hasten the development; the picture was produced more rapidly, but if they touched it with their finger or a little cotton it would rub it entirely off; but with the very same collodion, they could have the image in the body of the collodion, so that when it was dry they might rub it with their finger and give it a burnished appearance. He had one or two plates there to give a proof of that. With the same collodion he had had the picture upon the surface, and, as was seen there in another plate, in the body of the collodion. He had never tried to produce collodion in the way that Mr. Hardwich advised; he had always produced it in a way almost the opposite, and he found that

instead of the washed plates being slow in development, for dry plates he thought they were exceedingly quick.

Mr. ELIOT asked whether Mr. Watson used albumen or gelatine.

Mr. WATSON always used albumen in preference to anything else, because it gave a decided firmness to the film.

Mr. MALONE thought he could clear up what appeared a discrepancy in the mind of the last gentleman who had spoken. From Mr. Malone's experience in albumen, he thought it might be explained. He exposed a film to the vapour of iodine, which produced a deep orange colour; that was immersed in nitrate of silver; by developing with gallic acid he got a negative image, which he should describe as in the film, but on developing with pyrogallic acid with nitrate of silver, he then got, piled up, an image on the surface, like the daguerreotype. That was a surface image. The change was carried on out of the surface of the plate. The silver so piled up was, of course, loosely adherent, and could be wiped off. If you use strong solution with nitrate of silver, in the first place you produce the spangles of surface silver, and then heap it up in the metallic form; and he thought, taking into account the difference of little or much silver, it would be seen there was no great discrepancy in the matter, and that Mr. Hardwich might be right, and that the collodion should contain sufficient porosity to allow the development to go on.

Mr. WATSON thought Mr. Malone had misunderstood what he had said, or perhaps he had not explained himself clearly. Mr. Malone appeared to think Mr. Watson meant that the picture on the surface could be burnished. If it were attempted to rub such a surface as that the picture would be destroyed with a mark all over it, simply because the picture was powdery on the surface; but it was when the picture was in the body of the collodion that it could be burnished.

Mr. MALONE said he made all his experiments with an agate burnisher.

Mr. HARDWICH said he had jotted down a few notes upon the remarks that had been made by the different speakers, and he would reply to them one by one. He understood Mr. Davis to ask why did not Mr. Hardwich first immerse the cotton wool in the common form, instead of putting it into a solution of sulphuric and nitric acid. Mr. Hardwich had an impression that if he attempted to lay cotton wool in the sulphuric acid it would be dissolved. It would be necessary to have a small portion of nitric acid to prevent the cotton wool from dissolving. Then Mr. Davis next asked as to penetration. Mr. Hardwich believed the penetration assisted the development, but it seemed to him the horny film would have the image more on the surface, and be more easily removed by cotton wool; therefore, although he believed that penetration assisted the development; he thought it was quite possible to develop an image almost, if not entirely, superficially. Now, was Fothergill's process a slow one? He recollected a letter he had received from a clergyman, who was a close observer, who said he had succeeded with the Fothergill process in stereoscopic plates, but not with large ones. He had an impression that it was a slow developing process, and worked with difficulty when they used a lens of a long focus and newly iodised collodion. He had never seen the water markings—he had read of them, and quite agreed with Mr. Davis that the proper way to avoid those brain-like markings on the sky is by keeping the developing solution moving, and he was inclined to hope that that did not affect the delicacy of the picture. With reference to Mr. Eliot's observations, he did not think Mr. Eliot quite entered into his views on the subject of the state of the film. Mr. Eliot communicated a process some time ago, by which he described a process for purifying a nitrate bath contaminated with organic matter by using citric acid. He (Mr. H.) found that by using citrate of soda a chemical compound was formed between the citrate of silver and the organic matter, &c., following that up with gelatine and other substances he found similar chemical compounds produced. In dry processes much depended upon having a collodion that admitted of this double combination, and he did think they must have a collodion in which the pyroxyline itself was capable of extracting some of the nitrate of silver, and then entering into some combination with a portion of the iodide—not the whole of the iodide; and, repeating what he had before said, he recommended for the dry process a collodion which for some reason or other should have that property acquired by organic decomposition of combining with nitrate of silver. He had made pyroxyline by boiling with nitric acid, and in that case he thought he obtained glucose. He had first in the film the organic compound of the pyroxyline, with a small portion of the iodide, which made it in a measure independent of the albumen. As to Mr. Hughes's remarks, with regard to the action of chloride or bromide and of iodide in the wet process and the dry, they are exactly opposite. It was known that there was a compound, the iodo-nitrate of silver; but if he tried to put it in form, and say a compound of chloride and nitrate of silver, that did not express it. He could form the iodo-nitrate, but he could not form the chloro-nitrate. He found that he had a distinct compound of the iodide with the nitrate, but none with the chloride, therefore he should expect that the chloride would act differently in the dry process. As to Mr. Malone's observations upon the change in the drying of the chloride of silver, that was a very different molecular condition, and had a great deal to do with it; and he scarcely knew how much to attribute to molecular condition and how much to chemical action—both undoubtedly played important parts. The members would see by the test tube he held in his hand the chloride of silver in suspension, and that it would not go down: had the very finely divided state of the silver in that anything to do with it? He thought what Mr. Malone mentioned with regard to chloride of silver changing in drying, had something to do with it, and hoped he (Mr. Hardwich) would always be found open to any reasonable view. Mr. Shadbolt had spoken of his (Mr. H.) using two acids: The paper which he had the honour of bringing before the meeting was a paper on the theory of the subject, and he wanted to ascertain precisely what part the sulphuric acid played, and the thing was of great importance. Last year he obtained collodion in London perfectly powdery, and the negatives were so extremely weak that it was impossible to work the collodion; the skies were insufficient, and it was thrown aside as useless, and soon after he received a letter from a gentleman at Malta, who said he had a collodion which ought to be fit for the dry process, but gave a weak negative, and he (Mr. H.) had no doubt that was made with nitric acid, and that was the reason it would not give intensity. He did not recommend the two acids—he simply wished them to be tried. Mr. Crace spoke of adding organic matter in the baths. He once used some glycyrrhizine in the bath; he got an excellent picture on Monday, and on Saturday he got a reversed action of light, and a positive instead of a negative. The organic matter must be in the collodion, and must be something which cannot be dissolved out in the bath.

Mr. Barnes said that he did not think they would succeed by the Fothergill process with larger plates than 10 × 8, and then not with more than six out of a dozen: the film would tear off when drying, after the picture was completed. There was one on the table which had curled off the plate at the time he was in the dark room washing it; he had a solution of gum there, and, touching the edge of the glass plate with the gum, that prevented it from coming away. In some instances he had seen the pictures 10 × 12, though in every other circumstance perfectly satisfactory, completely curled off the plate—just sticking to the plate in particles. The greater proportion of the negatives on the table were produced by first coating the plate with albumen; it did not matter how thin; and that was the only way, he thought, they would succeed with the dry process. He had in his hand a transparent positive, produced by Mr. Watson, and in his remarks he said it was a rapid development; Mr. Barnes admitted that if it was a positive on glass it was a rapid development, but that was a very different matter: he had always been able to get a positive in five or ten minutes with the development, provided it were sufficiently exposed.

Mr. Hardwich further said he certainly thought they ought to thank Mr. Barnes for bringing forth plates of a large size. He thought they wanted to know what process would do on larger plates as well as on those on which short-focus lenses were employed. He might take that opportunity of saying that he had always valued Mr. Barnes's work most highly. Mr. Barnes would excuse his (Mr. H.'s) saying that too many things were published without giving the reason; and it behoved an inventor, if he wished to claim the public credit of his invention, to distinguish the essential from the non-essential, otherwise others would come forward if they elucidated a point, and must, of course, have the credit of that, although the thing might have been indicated or alluded to before. In photography it was impossible to go back to ascertain who was the first inventor of many things. Except Archer's collodion and Mr. Fox Talbot's works it was impossible to say who was the inventor. He thought they must all work together, and all obtain a share of the credit. With reference to the image being in the albumen, it appeared to him that the image would be in the gum-arabic if it were upon the albumen. Every organic substance gave an image of a peculiar colour. When it was in the albumen it gave a yellow, but in gum it gave a ruby red. If he had gum at the top of the albumen, he obtained a red. He also observed that if he took a certain plate of collodion and dipped it in the bath, and coated it with gelatine, the film is not so creamy in the bath; and when he came to develop, he saw an indication in the gelatine of the image being more intense; but if he took another coat of gum, the image would be in the gum and not in the albumen. He had found that the preservative at the top was the one most likely to furnish the image—of course he only judged by the colour.

The meeting then adjourned at an unusually late hour.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

AT the ordinary monthly meeting held at Myddleton Hall, on Wednesday, the 28th ult., W. SHAVE, Esq., was in the chair.

The minutes of the previous meeting were read and confirmed; after which Mr. GOSLETT called attention to an inaccuracy that had crept into the report of the proceedings of the meeting respecting the method of flattening crown glass. *A hot iron is not passed over the surface for the purpose of removing inequalities;* but the glass is laid on a smooth stone in the kiln and exposed to a great heat; this renders it very flat, and produces what is called *fire polish.* After this, if it is to be converted into *polished flatted* crown, it is polished by hand. This glass is as good as patent plate for small pictures; but for larger sizes, say 10 × 8 and upwards, he would not by any means recommend its use; patent plate being so much flatter, and less liable to breakage in the printing frame.

The CHAIRMAN then called upon Mr. Melhuish to read his paper on the Metal Camera produced by him. [See page 5 in our last.]

A vote of thanks was given to Mr. Melhuish, and a general discussion ensued.

Mr. MELHUISH stated that he had had under consideration the expediency of using vulcanite, papier maché, or cloth, for the panels of *large* cameras, where the styles and frames were made of metal; but he doubted whether any advantage would be gained by their use, as metal could be employed so very thin that the weight would be no greater than either of the above-named substances.

Mr. LYON exhibited a camera of his own make, in which the shutter, instead of being drawn up, was made to fall forward into the body of the camera. The camera was made upon the American bellows principle, the bellows being formed of roan leather; but skiver, a thinner kind of leather would answer the purpose equally well, with the advantages of being both lighter and cheaper.

The CHAIRMAN said that in the cameras he used, and which were made by himself, the dark slide was drawn out at the side.

Mr. HUGHES exhibited a very compact stereoscopic camera. The dark slides (six single or four double) were contained in the body of the camera, with a movable diaphragm, which divides it when in use. The tripod head is fixed to the bottom of the camera: this he regarded as a great advantage in many respects, as it cannot well be lost, break the ground-glass screen, or scratch the camera in stowing away, or tear the pocket like those now in use when so carried. The slides glide into a *horizontal* groove or rabbet, constructed in connection with a light framework at the back of the camera, which framework itself is capable of being slid out vertically (like the slides in ordinary cameras) in order to give access to the interior of the camera for packing away the spare slides, &c., for carriage. The stand is in the form of and about as stout as a strong walking-stick.

Mr. HUGHES regretted that he had promised to exhibit the camera this evening, as he had already made several improvements, and others suggested themselves, so that by another month he hoped to render it the most useful and compact camera in the market.

The thanks of the meeting were given to Mr. Hughes.

Mr. SQUIRE exhibited a stereoscopic camera for taking instantaneous and other views. On the front were attached two revolving discs, similar to those under the stage of a microscope, and furnished with apertures of different diameters; these were covered by a flat shutter of metal, capable of being released by a spring, so that the two lenses are opened and closed simultaneously. The focus is arranged from the back by means of a screw; the lenses are fitted inside the camera in *wooden* mountings. The revolving diaphragms, as arranged in this camera, are not in the least in the way, and the focussing screen is hinged to the top so as to turn aside to admit the dark slides; thus there are no *loose* pieces to be lost or forgotten. The whole affair is very compact and well designed, and will, with some further improvements contemplated, no doubt prove deservedly popular.

Mr. SQUIRE also exhibited some stereoscopic views of waves.

The thanks of the meeting were voted to Mr. Squire.

Mr. W. BOLTON, of Holborn, exhibited copies of the *Amateur Indian Photographic Album.* They were greatly admired, and considered very far superior to the numbers of the same publication exhibited by him last year. He also exhibited *Stereoscopic Views in India,* by Captain Scott.

The CHAIRMAN informed the meeting that the presentation photograph would be ready for distribution at the next meeting, on the 25th January.

The meeting then adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE third meeting of the session of this society was held at the Rooms of the Literary and Philosophical Society, 36, George Street, on the evening of the 4th instant, Mr. DORRINGTON in the chair. In consequence of the season of the year the attendance of the members was unusually small.

Mr. H. Petschler was elected a member of the society.

The HONORARY SECRETARY reread Mr. Shadbolt's paper *On Lenses,* which had been previously read at the former meeting, and the discussion on it adjourned to this meeting. A general discussion took place upon the subject of the paper, particularly as to the position of the stop between the lenses.—The Secretary also read a letter from Mr. Joseph Sidebotham, stating his inability to be present, as he was going to Paris; and calling the attention of the society to the misapplication of the word "instantaneous," as generally employed in photography. A photograph taken in several seconds, or in a fractional part of a second, being both called "instantaneous." He hoped some one would be able to suggest a more correct word, and thought if our own language was deficient in such a word we might seek the aid of foreign ones.

The members thought no better or more expressive word could be used, and that the only plan to get out of the difficulty would be to state the exact period of time, either in seconds or in the fractional parts of a second.

Mr. PARRY said that Mr. C. Hebert, a member of the society, had stated that he believed the most important of all matters to be observed in the preparation of the collodio-albumen plate, to avoid blisters, was to let the collodion film set very well previous to its immersion in the bath.

It was thought by the members that this was very important, but some of them considered the baking, after the coating with albumen, was of the greatest consequence.

Mr. PARRY wished to know if anything could be suggested in the way of lightening the weight of the cameras.

Mr. MUDD said very small and light folding stereoscopic cameras might be constructed so as to go into the coat pocket.

A general discussion took place on the subject of deal, metal, and otherwise constructed cameras.

The CHAIRMAN stated that some plates he had put in a metal box were covered with red spots on developing.

Mr. MUDD also said he had noticed the same effect, but thought that in all other respects metal boxes were very good for preserving plates.

The red spots were believed by some of the members to arise from the sharp edges of the glass detaching small particles of the solder in the groovings.

Mr. WARDLEY exhibited some plates prepared at Mr. Mudd's establishment, and not developed until five months afterwards, being exposed four months before development. The negatives were handed round, and were very clear and good, showing no signs of redness from over-keeping. They had been placed in a metal box.

Mr. WARDLEY said he had not found the objection that deal boxes took away the sensitiveness of plates, as was usually complained of.

Mr. PARRY said he had kept plates in deal boxes very satisfactorily, but thought it best to varnish them.

The CHAIRMAN said he had lately obtained some of the German glasses, and had experienced much annoyance from the great difficulty of getting them clean, and the irregular way in which they were cut.

Mr. PARRY said he had found Chance's, of Birmingham, the best and the neatest cut glasses.

The CHAIRMAN exhibited several stereoscopic negatives which he had taken by the gelatine and raspberry vinegar process. They required about the same exposure as for collodio-albumen, and he thought the process was capable of producing first-class negatives as well as transparencies.

Mr. PATTERSON said he had tried the process, and liked it very much.

Mr. WARDLEY had often tried the process, and had also obtained as good results from a combination of gum and sugar; he thought the collodio-albumen process was still the best for negatives. He (Mr. Wardley) wished to call the attention of the members to a peculiarity in the plates prepared by Dr. Hill Norris, namely, that if the plates were not developed soon after exposure the image gradually disappeared. Dr. Hill Norris had admitted this fact, and recommended the plates to be developed as soon after exposure as possible. Dr. Hill Norris's plates kept very well indeed up to the time of exposure.

Some discussion took place upon the comparative merits of the collodio-albumen and the raspberry syrup process, and it was generally thought collodio-albumen was still the best.

The HONORARY SECRETARY announced that Mr. Mabley had kindly promised to read a paper at the next meeting upon *The Various Methods of Paper Printing, Toning, &c.*

After a vote of thanks to the Chairman, for presiding, the proceedings closed.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE monthly meeting of this society was held on the evening of Tuesday, the 11th instant.

Dr. WALKER occupied the chair.

After the minutes had been read and agreed to, the following gentlemen were balloted for and admitted members of the society:

—Mr. Thomas Pearce, Braemar; Mr. J. Stewart, Inverness; and Mr. A. Claudet, London.

The CHAIRMAN stated that at the last meeting of the council it had been determined that it should be referred to Mr. Horatio Ross to award the prizes offered by the society for the best pictures in the exhibition.

Dr. PATERSON, of Leith, who had successfully practised the process during the last autumn, then made a communication

On the Dry Collodion Process.

The dry collodion process (he said) was now beginning to occupy a prominent position in photography, not only from the effects being equal to anything yet produced by the wet collodion process, but from its being so much more portable and convenient in the field. The dry processes might be divided into two:—first, those properly so called dry processes, where no preservative had been used for the protection of the collodion film; and second, those in which such means had been considered necessary. In the first, resin, amber, gutta percha, and more lately a peculiar kind of pyroxyline, had been used in the formation of the collodion, which, upon being used in the ordinary manner, sensitised, and then worked, was said to keep for any length of time without injury. With the exception of the last, all the others had been tried by him, but without satisfactory results; and it was his distinct conviction that no collodion film would give anything but uncertain results after a time, without some preservative covering. The great desideratum in plates preserved in this way had not been that some of them by all the processes did not give good results, but that the results were not certain; that with all the care which could be bestowed on the process, out of twelve prepared plates seven or eight would turn out failures. Now, the process which he was about to describe to the meeting that evening counteracted, he thought, much of that uncertainty. The plate was coated with a certain kind and thickness of collodion; it was immersed for a given time in a bath of a *certain* strength; it was washed with a *given* quantity of water; it was then coated with a *given* strength of the most simple preservative solution; and then it was dried slowly by means of heat. By this method much more equal results necessarily followed than if the plates were washed with an *undefined* quantity of water, and with a preservative solution, which some recommended to be made acid, some neutral, and some alkaline. The Doctor then exhibited the apparatus used for drying the plates, as also some of the negatives themselves of large size, and a number of views taken by the process; and showed, as an illustration of the equality of the prepared plates, four views taken on a recent excursion to Inchcolm. The four plates were taken out of a number which had been prepared six weeks previously: only four were taken, and the results were equal in them all. The process was not new, but some modifications he had made of existing processes, had enabled him to work with a certainty which in no other process he could attain. He then reviewed at considerable length, and with great discrimination, the principal dry processes at present before the world, and stated that the one he then advocated was the following:—The plate being coated with collodion containing a large proportion of alcohol, is excited in a silver solution which is rendered acid by the addition of acetic acid.

The collodion consists of—

Sulphuric ether and alcohol, of each.........	12 ounces.
Iodide of cadmium	40 grains.
Iodide of potassium............................	40 „
Bromide of cadmium	20 „

The silver bath consists of—

Nitrate silver	40 grains,
Acetic acid	20 „

to each ounce of water.

It is then washed in a limited quantity of water, and after being dried by heating, it will keep ready for exposure; and the development is with pyrogallic, formic, and acetic acids.

Dr. Paterson's address was warmly applauded, and a vote of thanks was tendered to him.

Mr. MACNAIR stated that he had hit upon a dry process, which he thought promised to give good results. It consisted in substituting brewer's wort for the various agents used in preserving the plates. In conjunction with Mr. Taylor he had carried this process to a successful issue.

Mr. TAYLOR then exhibited some specimens, and gave an account of the manipulations requisite, stating that he always developed with protosulphate of iron.

Mr. ORANGE said that, of all dry processes, he preferred Taupenot's, especially for printing transparencies, of which he manufactured large quantities.

Mr. BURNS exhibited a number of stereoscopic prints of exquisite beauty, which were much admired. These, he said, were taken by a process which some of the previous speakers had spoken unfavourably of, but which he thought gave results which left nothing to be desired. He alluded to the process known as "Fothergill's."

A committee, consisting of Messrs. Watson, Henries, Tunny, Orange, and Dr. Paterson, was appointed to examine and report on as many of the dry processes as they judged it desirable to investigate, beginning with that of Dr. Paterson's.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

[In consequence of the unusual length to which our report of the meeting of the Photographic Society runs, we are obliged to postpone the continuation of this valuable paper till our next.]

The author of the preceding paper has, in order, to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students, in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

C. A. L.—A good white pigment is of the greatest importance. The best "Chinese White" I have used is that sold by Newman, of Soho Square. It is necessary to have it perfectly pure, free from the slightest taint of iron, and it should be preserved if possible from the effect of sulphureted hydrogen. I believe many water-colour drawings have been injured by hanging in a room in which gas is regularly burnt. I have tested the pigments of most makers.—With a trained eye, cultivated taste, and manipulative skill, you ought certainly to make an excellent photographer.—Body colours should never be used in water for flesh.

Foreign Correspondence.

Paris, January 10, 1860.

PERMIT me the gratification of wishing you a "happy new year," hoping that you will be even more victorious under your new ensign of the BRITISH JOURNAL OF PHOTOGRAPHY than under the old one. May the new year bring you a fresh accession of subscribers, and may they and you continue to propagate photography to the end of the present century.

Looking back upon the past year, we cannot say it was distinguished by any remarkably brilliant discoveries; let us hope that the present year will be more honoured. Our Photographic Society displays much energy and business tact, and its efforts to advance the art must be gratefully appreciated by all who follow it. MM. Davanne and Girard have reported a new stage in their researches in positive printing, and have now treated of "fixing"—certainly the most delicate and important operation in the production of positive proofs.

M. Albites, an eminent artist, and sculptor, and photographer, has invented a piece of apparatus by which he is enabled to take portraits, views, &c., in the open air, without the aid of dark box or tent. It consists in mounting the camera upon a light box, containing the bath of nitrate of silver, the bath of distilled water, and the developing bath of proto-sulphate of iron, and when pyrogallic acid is used, a sort of portfolio, one of the sides of which is formed of transparent yellow glass. There is no frame to sustain the ground glass or collodioned plate. The ground glass is applied directly against the back of the camera, and is replaced by the collodioned plate when the picture is taken. This plate, when in position, is in connection with a shutter, which follows it in every movement, up and down, or down and up; the shutter is also connected with a chain by a handle, which it is only necessary to turn one way or another to raise or lower the shutter, and to immerse the plate either in the aceto-nitrate bath, or the water bath, or in the developing bath of sulphate of iron, or in the portfolio, where it is submitted to the action of pyrogallic acid.

The collodioned plate is immersed in the nitrate bath for about ten seconds, and washed by being immersed in pure water four or five times. To perform these immersions, the plate must be taken from the focussing place, and brought again to the focus when it has been washed for the last time; the necessary exposure is given, and then the plate is immersed in the developing bath, or in the portfolio. If by any accident the image cannot be taken so promptly as wished, or there is reason to fear that the collodion has become dry, there is always this resource, by a simple movement of the handle—the collodion can be again moistened by being immersed in the bath of pure water, or even in the bath of nitrate of silver.

I hope this description will suffice to enable your ingenious readers to construct one for themselves in the absence of diagrams, which I regret being unable to send you.

Dr. Valtier exhibited a very curious photographic anomaly at the recent meeting of our Photographic Society. He had a negative of a view of Shanghai, in China, which was so altered that the strongest points had become almost invisible; the picture seemed to have entirely disappeared; yet positives taken from it were as good as others, and as full of *chiaroscuro* and detail. He asked of the chemists present an explanation of this singular fact.

MM. Davanne and Girard gave the following:—

What had disappeared from the negative was the darks, formed (according to the French theory) of metallic silver, almost pure; and these darks had become pale because the metal was transformed into the yellow sulphide of silver. Under this new form the darks are scarcely visible to the naked eye, as they have lost, if we may so express it, their visual opacity; but they have preserved their chemical opacity, so that the light passing through the negative, loses all its photogenic action. What was for the eye only a screen, and appeared a shadow of greater or lesser intensity, was a complete screen and shadow for the sensitive paper placed under the negative, and thus it was that the positive proof appeared with details which had apparently disappeared for ever.

M. Davanne proposed a new developing agent, with a view of diminishing the weight of the photographic baggage, and of dispensing with acetic acid. It consists of a mixture of gallic, pyrogallic, and citric acids, in the following proportions:—

Gallic acid	3 parts
Pyrogallic acid	1 „
Citric acid	1 „

When the proof is removed from the frame, and the operator wishes to develop it, he takes a pinch of this mixture, dissolves it in water, and employs it in the usual manner. J. P.

Exhibition.—Photographic Society, London.—The private view took place on Thursday last, 12th instant, when there was a large attendance of members and visitors. We purpose noticing the collection critically in our next.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

OPERATING ROOMS.

To the Editor.

Sir,—You would much oblige by enlightening me in your next issue of The British Journal of Photography upon the following:—

In an operating room, the light of which *must* come from the south, I think there will be great difficulty and great loss of light by having to obstruct the direct rays of the sun with calico blinds. What, in your opinion, would be the loss of light by using ground glass instead of clear glass?

If the last twelve months of the Journal completes the volume, when may we expect the index? I am, yours, &c. X.

[We think that ground glass would not be advisable, because it would scarcely be sufficient to shut out superfluous light when the sun shines direct upon it, while towards the afternoon, when the sun is setting, the obstruction would be found very inconvenient. Blinds are decidedly preferable, and it is as well to have them of both white and blue calico, so that either can be used as occasion requires. When the sun shines in the middle of the day, the blue blinds are very useful, not all over the glass of course, but just to protect the sitter. It is as well to be able to arrange your sitter so as to look eastward in the afternoon, and westward in the morning. A very convenient arrangement for the blue blind is to have an iron rod along the upper part of the roof, and another just where it joins the upright; if the calico has rings at both ends, it can then be slid over any part of the floor.

We announced in our last that the index for the volume just completed would be furnished with the present number.—Ed.]

A GRAND IDEA.

To the Editor.

Sir,—I am now studying photography with a novel purpose, of which you may perhaps like to know something. The idea was suggested to me by some one who told us how we might discover if mice existed on the surface of the moon, by photographing that luminary, and magnifying the image. I tried that experiment though, and discovered—I couldn't exactly make out what, but it was *very wonderful*.

Now, I intend to photograph the apertures of key holes, and then, by magnifying them, who knows what I may not discover? Eh! Eh! Eh! Dont you chuckle and rub your hands? Isn't it a capital idea? Now acknowledge would any one but me, *Paul Pry* (I am that celebrated historical personage)—would any mind but mine have conceived so grand an idea?

Now, in return for just "dropping in" with this valuable hint, dont be offended if I find fault with the way in which you conduct your Journal.

You must know that I consider the publication of "a chiel amang you takin' *notes*" to be the *beau-ideal* of photographic journals. I get more information, of a kind that suits me, from one number of his periodical than from all yours of last year. For instance, the "chiel" makes me acquainted with all his domestic and personal affairs; you never do. He tells me about his wife, about her ideas concerning the domestic policy, and when he makes her a present, about his little boy, about his servant girl, about "his ox and his ass, and every thing that is his." I know when his pen is a bad one, what his house is like, when he goes out, when he comes in, when his friends come to see him, what they say and do, how his health is, &c., &c., &c.—in fact, all about *him*.

Now, about *you*, what do I know of you? Why, I only hear say what you are and where you live, and part of that I learnt from the "chiel" aforesaid, in his number for Dec. 15th. I dont know if you are married at all. I dont even know if you have any family, or, if you have, whether they are boys or girls, or both. Now, dont you believe that I shall continue a subscriber if I dont get more information for my money, because I shant. Again, why dont you show that you have some consciousness of your own immense importance by dropping the humble editorial "we," and substituting the "I."

I'm sure I hope I dont intrude, and am, yours, &c.

Kew Rye House, Dec. 30th, 1859. PAUL PRY, Photographer.

P.S. I am taking out a patent for key-hole photography, and will punish severely all who infringe it.—P. P., P.

ANSWERS TO CORRESPONDENTS.

☞ Numerous Correspondents, whose letters do not appear in this number, must bear with us till our next.

W. W.—Received. Report in due course.

Posed.—Line your camera with black velvet.

Emily.—Take a course of lessons in photographic colouring.

Photus.—Mr. Moule, the patentee, will answer your question.

H. N. King.—Received. Report as soon as we have time to test it.

Fides.—We shall be ready to consider any hint you may offer on the subject.

G. N——n.—English papers are preferable for positive proofs by development.

P. D.—James Seaforth.—We have an article on the subject in contemplation.

Tyro.—The process is far too difficult for you in your present state of knowledge.

Benson.—Let well alone. Why add acetic acid to your bath if it works well without it?

Alpha.—Slow development is much more manageable than quick. "Slow and sure" is a good motto.

Acton.—You need not vex yourself about so large a lens; a small one of long focus will do very well.

Infelix Puer.—You will find an excellent paper on the subject by Mr. Hardwich in the present number.

Nonplussed.—Your collodion probably contains too much water: add some made with absolute alcohol and ether.

Probus.—Chloride of barium is much more expensive than chloride of ammonium, and not any better for salting paper.

S. S.—Your albumenised-paper contains too much salt, which dissolves in the nitrate bath, and precipitates chloride of silver.

G. K. L.—Frith & Hayward (of Reigate) would no doubt undertake it. We *know* that they could accomplish what you mention in the time specified.

James R———s.—Received. We cannot find sufficient merit to accord a *favourable* notice. Had you sent your address we should have intimated this privately.

Fenwick, S.—Syrup of iodide of iron was first used in photography by Dr. Woods, of Parsonstown, Ireland, if we remember rightly, and believe that the process he used first appeared in the *Athenæum*.

Thomas Cowley.—Your note of 31st December would most probably not have been sent had you waited till the 2nd instant, as we gave in our last an account and opinion of Mr. Melhuish's metal camera.

T. Bedford.—If you read this Journal carefully you will perceive that we never under any circumstances express an opinion upon the merits of any production that we do not conscientiously entertain. We do not, however, feel called upon to express *publicly* an unfavourable opinion, unless in condemnation of what we regard as a *public injury*. See reply to James R———s above.

J. B. Williams.—Any lens supposed to be achromatised, and containing a fluid as an essential part of its construction, is faulty in principle, as variation in temperature affects the density of the fluid materially, and thus interferes with the dispersive force. The late Mr. Archer used to make lenses on this principle, but found that he was compelled to abandon them chiefly on that account.

T.—A large lens is a positive nuisance; it not only works slowly as compared with at smaller one of shorter focus, but the results are not satisfactory. Of the makers you have named No. 1 is the best; but instead of having so large an instrument for plates 8½ by 6½, you will find his No. 3 a preferable, and only a shade more than two-thirds of the price you quote for the larger one. The relative rapidityof working we judge to be thus: No. 1, say 20 seconds, No. 2, 30 seconds, or No. 3 probably 90 seconds. By adopting what we have suggested you will perhaps get the 20 seconds reduced to 15 seconds, and have a much finer image.

Caustic.—Quekett's *Practical Treatise on the Microscope* (Balliere, Regent Street), is the *best* work that we know on the subject named, but it is somewhat expensive, costing *about* a guinea We are not quite sure whether Dr. Beale did not publish something of the kind at a lower price. Dr. Carpenter's work, *The Microscope* (Churchill, New Burlington Street), contains *some* information on the subject named, and much on the use of the instrument. As we were a worker at the subject before there were any manuals to be had, we never had much occasion for them; but being personally acquainted with all the authors named we can vouch for their thorough orthodoxy.

⁂ The Title and Index for the Volume for 1859 are issued with the present Number. The complete Volume for the past year can now be had, neatly bound in cloth, price 8s. 6d. Agents and Subscribers can be supplied with loose cases for binding the last and previous Volumes.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 111, Vol. VII.—FEBRUARY 1, 1860.

It will probably be in the recollection of most of our readers that, some time back, when the Council of the Photographic Society of Scotland announced its intention of awarding prizes, under certain conditions, for the best photographs exhibited at its annual collection, and for papers read at its meetings, we expressed an opinion relative to the impolicy, and what we regarded as the injurious tendency, of the proceedings then contemplated, and offered certain suggestions relative to the method by which the advantages derived might be attained and the objectionable features avoided. Since that time we have renewed the consideration of the subject of prize-giving upon more occasions than one, and discussed it at some length. We endeavoured to show that mere successful competition was no real test of actual merit, and that the *method* of award adopted by the Scotch Society last year was faulty in principle. Whether our remarks had any effect in causing a reconsideration of the subject at the Council board or not of course we cannot tell, nor is it at all material; but it is with no little pleasure that we have to draw attention to the fact that the mode adopted upon the last occasion has been abandoned, and one in every way superior adopted for the present season.

Instead of the selection being made by collecting the votes of all the members of the Society who might choose to give one, it has now been placed solely in the hands of one individual nominated by the Council of the Society; the gentleman appointed to this rather onerous duty being Mr. Horatio Ross, one of its vice-presidents, and who is no doubt thoroughly competent to perform the task allotted to him. Had the appointment of an arbitrator even been by general vote of the members, there would we think have been no objection to the exercise of such prerogative on their part, as the uninitiated are always more discriminating in the choice of an *individual* who is to exercise his judgment in a matter of art than they are when attempting to conduct the executive function on their own behalf; but it is a matter which we think is still better done by the Council, which has in this instance exercised its authority with discretion.

It is not every one who has moral courage enough to admit having been in error even when convinced that such is really the case; but it is still more rare with a body of individuals, and consequently the more to be commended.

The present concession is quite as much as could have been expected for the current season. Indeed, after having advertised the offer of prizes under the conditions then put forth, we do not see how any further improvement in the method of carrying out the advertised undertaking could have been effected on this occasion; but with a Council animated by a spirit of progress, as we have reason to hope is the case from the evidence now before us, we shall look for still further reform next year, chiefly in an abandonment of the principle of mere competition as essential to any claim for reward, and the adoption instead, of that of conferring the prizes as marks of *recognition* of peculiar excellence or for services rendered to the art.

Thus applied, prizes may really act as a wholesome stimulus to exertion, especially amongst amateurs, with whom, by the way, most *improvements* originate, though in their application they are often, perhaps generally, distanced by their professional brethren.

We trust that the Council of the Photographic Society of Scotland will not be disheartened if it find that the awards made by its nominee do not give universal satisfaction. It is a difficult thing for a defeated candidate to be quite satisfied; but we do not hesitate to prognosticate that there will be far less of dissatisfaction than upon the last occasion.

Since writing the preceding, we have learned that the arbitrator named by the Photographic Society of Scotland has awarded one of the prizes to Mr. Henry P. Robinson, of Leamington, for his group, *Here they come!* which is also now on view at the London Exhibition (No. 429); and another to Mr. James Mudd, of Manchester, for his landscape, *Near Coniston, Lancashire*, of which a duplicate is also to be seen at the same place, and is numbered 488. We can only say that the works rewarded are in every respect worthy of such distinction, and have no doubt that Mr. Ross has faithfully discharged his somewhat onerous duty.

In Mr. Heath's description of the improvements in Smartt's tent, which may be found in the report of the meeting of the London Photographic Society, published in our last number, mention was made of a new kind of washing tray, or rather *sink*, to be used in that or any other tent, or substitute for it. Since then we have had an opportunity of more closely inspecting it, and find it even more ingenious than we at first thought it to be. The sink consists of a wooden frame-work for the sides, about three-eighths of an inch thick and an inch or inch and a-quarter in depth. The bottom is formed of sheet india-rubber attached to some textile fabric—the former serving to render it impermeable to moisture, the latter to prevent its being stretched or broken. We have called it a frame-work of wood, and so it is; for the two shorter sides of the parallelogram are attached to the longer by sliding into a small metal groove of very simple construction, while the longer sides are permanently attached to the india-rubber cloth. When in use all four of the wooden sides are external to the india-rubber tray, which is kept in form by them; but when required to be packed up, the shorter slides are slid out of their fastenings, and the longer ones allow of the tray bottom being *rolled round them* (the loose sides being first placed inside), so that when packed up the whole occupies no more space than a rod the length of the longest side of the tray, and about an inch and a-half square. At one of the corners is attached a tube to carry off the washing water, &c., and this tube is made of the india-rubber fabric; so that it is no larger when folded than a piece of broad tape, and serves when packing up the tray to wind around it, and make all "snug," as a sailor would say. The tray is really a most ingenious and convenient contrivance.

We are desirous of throwing out a friendly hint to our photographic friends in Glasgow. We understand that many are anxious to revive the activity of the Photographic Society in that city, and others who are not members to join it. We are informed also

that though this desire is unquestionable, everybody seems afraid of moving too quickly or energetically in the matter, lest he should be deemed officious. Now, this is sheer folly. Let two or three meet together and decide on some steady course of action, and the thing would be done. If any who are anxious to join in the good cause feel nervous about the matter, let them send their names to us, and when the number is sufficient to form a good working nucleus, we will advise with them, and lend them such help as is in our power.

PHOTOGRAPHIC CONTRIBUTIONS TO KNOWLEDGE.

"EGYPT AND PALESTINE:"

By Francis Frith—*Illustrated with Photographs.*

[FIRST NOTICE.]

There are but few persons in whom any mention of the localities above named does not stir up deep and lively emotions; and no wonder that it is so, for not only do the Holy Scriptures teem with direct references thereto, both in the Old and New Testaments, but they are also continually alluded to in a spiritual sense when treating of a future state of existence. One of the earliest impressions made on our childish imagination was, the flight of the Saviour into Egypt — Egypt the country in which Moses wrought such mighty wonders in execution of the awful wrath of the Almighty — where His chosen people "were oppressed four hundred years."

In the days when poetry and romance exert a potent charm over the youthful fancy, where so fitting a scene for the deeds of chivalry as Palestine, where the knights of old repaired to wrest from the heathen the holy places? This, be it remembered, is no fancy, but sober truth, albeit many tales of the wildest romance have been so mixed up and blended with the records of actual occurrences not less singular that it is no easy task to separate the two. This, so far from destroying the interest felt in a land around which the hand of the poet has cast a veil, has, without annihilating the hard lines of *fact*, superadded a softening influence that tends rather to increase the attraction.

In later life, too, when the history of the past becomes a theme so absorbing as to claim for its study the whole waking hours of many a learned man, what lands yield such a harvest of records of the past as those of which we are now treating? When recently noticing some stereoscopic illustrations of China, we could not help feeling impressed with the importance of them in an educational point of view; but, regarded in this light, what can we not say of the series of larger pictures now before us? We cannot but realise the fact that the art of photography is progressing with rapid strides, and though still but a child in years, it is doubtless destined to play an important part in the future history of civilisation. The wonder of yesterday has become the luxury of today, and will most surely arrive at the stage of being the *necessity* of tomorrow. It will no more be possible to do without photography than without the printing press — to annihilate which would be to cut off half our existence.

We have noticed of late a growing increase in the importance of the works dependent upon photography for their being; but of all that have hitherto been issued none have approached in grandeur of scale and excellence to the two truly magnificent volumes now before us, published by Mr. James S. Virtue, of the City Road, and of Ivy Lane, London.

These volumes — got up in a style that renders them a fit ornament for any drawing-room — contains no less than seventy-five views, chiefly of the highest order of merit as regards execution and interest of subject, and are such as are calculated to make the work an addition of importance to any library. In them the artist, the antiquary, the architect, and the historian will find abundant material wherewith to satisfy the cravings of their respective desires, while the general admirer of the beautiful will be no less gratified.

The very titles of the illustrations are enough to arrest the attention; and when we say that in general the execution of each picture is worthy of its subject, we can scarcely pronounce much higher commendation. Were we to assert that in all the proofs the execution is equal we should be misleading our readers; when could such a declaration be truthfully made with regard even to any extensive series of engravings? How could it then be expected that in photographs perfect uniformity could be attained? None of the series are mediocre—all have considerable merit—whilst by far the majority are of a *very* high character; those that are the least satisfactorily treated being the extended distant views, such as Bethlehem, Distant View of Damascus, and one or two others, in which a want of definition rather mars the effect. It is possible that the defect named may have arisen from an imperfection in the lens employed, or for the want of a little humouring, which some lenses require when taking "distance." With these trifling exceptions, we have scarcely a fault to find with the entire series.

This magnificent work is issued to subscribers only, and is completed in twenty-five parts, each part containing three views, of about nine inches by seven inches in size, accompanied by descriptive letterpress, on which we have somewhat also to remark.

In most works of illustration the letterpress is commonly treated as so much waste paper. It is, however, not likely to meet this fate in the work before us, it being interestingly descriptive, lively, and to the purpose, without being too diffuse, as is commonly the case. It is written by Mr. Frith, and though much consists of compilation, much also is original. Where extracts have been taken from previous publications they have been judiciously selected, and only resorted to when the information given is such as could not have been so readily acquired by the author's own experience.

We consider, by the way, that we have a right to regard Mr. Frith with peculiar interest, he having been originally a Liverpool Photographer.

Besides the mass of information connected specially with the various subjects delineated, there is much also of interest to the *photographer*, and the whole is put together in a very pleasant, unconventional style. There are many little extracts that we should like to have given, but our space will not permit us to indulge in more than the two following — for the present at least. We will begin with something photographic: let us take the introduction:—

"Salaam! — Peace be with thee, oh, thou pleasant Buyer of my book!

* * * * * * * * * * * * * *

"It is my intention, should my life be spared, and should the present undertaking prove successful, to present to the public, from time to time, my impressions of foreign lands, illustrated by photographic views.

"I have chosen, as a beginning of my labours, the two most interesting lands of the globe — Egypt and Palestine. Were but the character of the pen for severe truthfulness as unimpeachable as that of the camera, what graphic pictures might they together paint! But we scarcely expect from a traveller 'the truth, the whole truth, and nothing but the truth.' Hear Albert Smith, himself an accomplished traveller, and a popular author:— 'Artists and writers will study effect, rather than graphic truth. The florid description of some modern book of travel is as different from the actual impressions of ninety-nine people out of a hundred, allowing all these persons to possess average education, perception, and intellect, when painting in their minds the same subject, as the artfully tinted lithograph, or picturesque engraving of the portfolio, or annual, is from the faithful photograph.' Nobody that has ever floated in a *dahibieh*, will argue that any existing Nile book conveys 'graphic truth.' Yet it does not follow, O Albert Smith, that a photograph, because it is not 'over-coloured,' is therefore *faithful*. I am all too deeply enamoured of the gorgeous, sunny East, to feign that my insipid, colourless pictures are by any means *just* to her spiritual charms. But, indeed, I hold it to be impossible, by any means, fully and truthfully to inform the mind of scenes which are wholly foreign to the eye. There is no effectual substitute for actual travel; but it is my ambition to provide for those to whom circumstances forbid that luxury *faithful* representations of the scenes I have witnessed, and I shall endeavour to make the simple truthfulness of the camera a guide for my pen.

"Now we shall see (if my bungling does not spoil the match) what sort of chance Fact has with Fiction in the race for popularity.

"It is certain that a very large proportion — probably two-thirds — of the entire reading of the British public consists of works of fiction. Everybody, almost —

> "In these o'erpolish'd times,
> Can shed the tear o'er woeful rhymes;
> O'er plot of novel sore repine,
> And cry for hapless heroine!"—*Hogg*.

But few, I fear, can tolerate simple truthfulness: there is not enough of excitement in it. Even Englishmen relish a little of that pleasant hyperbole which the Orientals stretch to its limit of tension. It is remarkable that perhaps every book of world-wide fame (except the Holy Scriptures) is a romance. Shakspeare, Milton, Dante, nearly all the poets are novelists. Cervantes, Bunyan, De Foe, Harriett Stowe — all novelists. Furthermore, a man sitting quietly at home in London or New York may write even a Book of Travel, and an artist may compose for it a series of illustrations, with every chance of success, upon the most scanty materials, and without the cost and labour of travelling. It is an artist's privilege to 'make a picture' of his subject; but, alas for the poor photographer! and alack for the man who will write the truth, if he can, at all hazards!—they must be dull.

"A photographer only knows — he only can appreciate the difficulty of getting a view satisfactorily into the camera: foregrounds are especially perverse; distance too near or too far; the falling away of the ground; the intervention of some brick-wall or other commonplace object, which an artist would simply *omit*; some or all of these things (with plenty others of a similar character) are the rule, not the exception. I have often thought, when manœuvring about for a position for my camera, of the exclamation of the great mechanist of antiquity — 'Give me a fulcrum for my lever, and I will move the world.' Oh, what pictures we would make if we could command our points of view!

"I may be allowed to state, as giving additional value to good photographs of eastern antiquities, that a change is rapidly passing over many of the most interesting. In addition to the corroding tooth of time, and the ceaseless drifting of the remorseless sand, temples and tombs are exposed to continued plundering: governors of districts take the huge blocks of stones, and the villagers walk off with the available bricks, whilst travellers of all nations break up and carry off, without scruple, the most interesting of the sculptured friezes and the most beautiful of the architectural ornaments.

"The difficulties which I had to overcome in working collodion in those hot and dry climates, were also very serious. When, at the second cataract, one thousand miles from the mouth of the Nile, with the thermometer at a hundred and ten degrees in my tent, the collodion actually boiled when poured upon the glass plate, I almost despaired of success. By degrees, however, I overcame this and other difficulties; but I suffered a good deal throughout the journey from the severe labour rendered necessary by the rapidity with which every stage of the process must be conducted in climates such as these, and from excessive perspiration, consequent upon the suffocating heat of a small tent, from which every ray of light, and consequently every breath of air, was necessarily excluded.

"I think I will confess to a weakness for rapid production in all that I undertake. My views have been taken, for the most part, whilst my friends were hastily inspecting the scene or object copied; and, as for my letterpress, I can only write rapidly, and in the very words which first occur; I dare not revise — out goes one-half that I have written, and the remainder is intolerably dull. I have, however, one consolation, viz., that if the critics will be good enough not to call disagreeable attention to my writing, not one person in ten will think of looking at it. Scarcely any one ever *does* read the letterpress which accompanies a series of views, any more than one thinks of scrutinising the 'gold sticks' who shuffle, as a matter of course, after a royal pageant. Doubtless I am indebted for this security to the learned dulness of the great men who have hitherto invariably written for illustrated works, not one of whom, as far as I recollect, has been personally acquainted with the scenes which he undertook to describe. I am perfectly content that my own descriptive matter should be thus considered as entirely subordinate to the views. I have neither had time for elaborate investigations on the spot, nor is present space afforded for much topographical or critical detail: upon such points I shall often prefer simply to quote the opinions at which other and more useful investigators have arrived."

In order to give his subscribers an idea of the costume of the true believers, as the followers of Mahomet style themselves, Mr. Frith presents his own portrait as he appeared when attired as a Turk, touching which he says:—

"Turkish trowsers I shrink from describing; but if any of my readers have a fancy for a pair, they are welcome to the following recipe, which I pledge myself is literally correct:—Take four yards of broad-cloth of some brilliant colour, fold the piece in the middle and sew up the end; you will thus have a bag six feet wide and five feet deep, open at top and at bottom; sew up the bottom, except a small hole at each extreme corner for the feet to come through, and your trousers, *à la Turque*, are complete. To wear them the top of the bag must be bodkined, puckered, and gathered round the body with a worsted sash of bright colours and voluminous folds. The two yards of heavy double cloth which, as it were, webs the legs together, like the connecting membrane of the foot of a goose, hangs, you may imagine, with awful square solidity in the mid space; and when the fat gentleman walks, or rather waddles and rolls along, how it sways, and pendulates, and thumps, first against one leg and then against the other!"

There is one little matter for which we feel some regret, and that is, that in consequence of the publication being in "parts," the proprietor has judiciously enough managed to issue in each of the "parts" as great a variety of subjects as possible; but the binder of the book has *as injudiciously* arranged them in precisely the same order (a proceeding wholly unnecessary, as neither the plates nor the letterpress bear any paging or numbering), and we are consequently bandied about from pillar to post—now Egypt, now Palestine—up and down, backwards and forwards, in the most erratic manner possible. We would strongly recommend the numerous subscribers whom we are convinced will become purchasers of this beautiful work to have the several plates with the descriptive letterpress arranged in something like an order of locality for binding, which could very readily be done with but little trouble.

In our next we shall proceed to describe critically the magnificent plates which illustrate the work.

ON THE OPTICAL CENTRE.

By Thomas Grubb, M.R.I.A.

No. I.

In proceeding to treat of the *Optical Centre* (real or imaginary) *of a combination of lenses having one or more intervals between*— such for example as the photographic portrait combination — it seems desirable to commence by ascertaining precisely what is meant by the term when so applied.

I apprehend that no definition of such a centre is extant, and that we shall not find (probably with reason) such a centre treated of in any optical work. To photographic publications, then, we are referred for a knowledge of what is meant by the term; and here we find that when the question of the best place for the limiting diaphragm (or stop) in a portrait combination is discussed, some will advocate placing this diaphragm between the first and second combinations, where the optical centre is situate; and in that combination described as the symmetric triplet, the optical centre is assumed to lie in the centre of the combination, and from which position of the optical centre certain good qualities (real or unreal) are inferred.

We therefore are not left at any loss to conclude that what is generally understood of this optical centre is, that such compounds as I have alluded to have each a fixed and determinate centre, *analagous to the optical centre of a single lens*,— one not variable, or to be disturbed by the circumstances under which the compound is used, but remaining *intact* so long as the compound remains unaltered. We may in vain look for such an optical centre. The idea is evidently borrowed from the circumstance that every individual lens has its fixed and determinate optical centre, which centre, as it is treated of in all elementary works on optics, I think it unnecessary to enlarge on here; but for the information of those who wish to avoid the trouble of reference, I may state that in an equiconvex or concave lens this centre will be found in the centre of the lens. In the plano-convex or plano-concave it touches the curved side, and in lenses which have one surface convex and the other concave, the optical centre is outside the lens, and on that side which has the greater curvature, in all cases this centre being found somewhere *in the axis of the lens*.

I am not aware of any standard work on optics being published since the portrait lens has assumed an importance demanding a theoretical investigation of its principles. All that was previously required in that way was nearly comprehended under the aplanatic telescope, where the intervals occurring between the lenses of the object-glass are so small as may well be neglected. The portrait lens, as also analagous combinations, present a widely different case. No adequate idea of their principles of working can be arrived at without making due allowance for the intervals between their respective lenses; and the most we shall find for our guidance here in standard works on optics is, perhaps, some general analytical expressions of the theory of such compounds, with an announcement either that the investigation is complex or difficult.

By pursuing the method of diagrammetrical illustration, I hope to be able to lay within the reach of those who are desirous of investigating the subject more fully, sufficient for this purpose, at least for a commencement. I would also hope to show the mere

cursory reader (whom I shall also suppose to be an experimental photographer) that the examination of the merits or qualities, individual or comparative, of such compounds is by no means that light or easy matter which is commonly considered.

I shall commence by asking the reader to get rid of all idea (should he entertain such) of a *fixed* centre appertaining to any *open* compound (by which term I propose to express such as have one or more intervals between the lenses). True, the change of place of any centre we may be able to find in such is not great in amount, as we shall see hereafter; but its amount is quite adequate to destroy all idea of fixity, as well as to place in the category of "for further examination" any theory which may depend for its own correctness upon this assumed fixity.

(To be continued.)

FAILURES IN THE WET PROCESS: THEIR CAUSE AND CURE.

By Mr. Leake, Jun.

[Read at the South London Photographic Society, January 19, 1860.]

A short time since we were favoured by our vice-president with a valuable and interesting paper on failures in the dry collodion processes. This evening, by your permission, I purpose offering a few hints on some of the failures most commonly met with in the wet collodion processes; and, lest I should be accused of wishing to teach my grandmother, &c., permit me to state that I have not written this paper so much in the hope of imparting information to others myself, as in the hope of eliciting it in discussion from those gentlemen present who are so well qualified to teach.

Notwithstanding the difficulties — and they are not few — at present wet collodion is unrivalled for sensitiveness, certainty, and, I think, beauty of result; and I consider the extra trouble of more apparatus is compensated for by your ability to determine on the spot the success or failure of the operation, while the extreme sensitiveness of the surface enables the operator to produce perfect pictures of objects in rapid motion — a feat yet *to be* performed by the dry process. I will not further trespass on your time by speaking in favour of a process adopted as the best by such photographers as Fenton, Rejlander, and Lake Price, but will proceed at once to point out the causes of the failures which most commonly occur in its practice.

Failures in the wet collodion process may be classified as follows: — First, those arising from external conditions, as intense heat, or extreme cold, &c.; secondly, those from defects in the chemistry of the process; and, thirdly, from defective manipulation. We will, if you please, consider these in the order I have just given, and I will endeavour to lay before you a specimen of failure from each of the causes I shall mention, hoping that, in each case, the recognition of our enemy may lead to its expulsion from our future operations. I suppose all who have worked this process through a hot summer have met with failures from intense heats. The most common effect is that exhibited in plate No. 1, viz., a general muddiness, weakness, and tendency to fogging, from the film becoming dry. Of course this takes place more rapidly in hot than in cool weather, consequently exposure and development should follow the excitation at as short an interval as possible.

But by far the most common failure from intense heat is the deposition of silver on the shadows of the negative during development, as in plate No. 2. If the development be finished when this action is set up the high lights are entirely dissolved, and instead of a negative, we have a positive by transmitted light.

During the intense heat of last summer (the temperature ranging from 90 to 110 degrees), I was much annoyed by the occurrence of this failure, the second application of the developer invariably spoiling the picture. The process of development was that with sulphate of iron and subsequent intensifying with pyrogallic acid. I found there were two remedies for this evil: the first was fixing after the first development, and then intensifying with pyro' as usual; and the second, pouring a solution of tincture of iodine over the plate after the first development, then giving a short exposure to light, and intensifying with pyro' and silver as before. The tendency to solarisation, always so manifest in hot weather, may often be almost entirely obviated by the use of a small stop.

From the fact that our most intense heat and powerful light come together, I am inclined to think that our pictures are more often solarised from over-exposure than we, not knowing the power of the light, imagine.

In briefly noticing failures from extreme cold, the converse of the remark just made will apply; and I certainly think that the cold is often set down as the cause of failure when the light is so deficient in actinic power that no amount of exposure will produce a brilliant picture. When this is the case the lights of the picture will be solarised, while the shadows will be scarcely impressed. The picture I exhibit as a specimen of failure from this cause was exposed on a warm October afternoon, clearly proving that cold was not in this instance the retarding agent.

Again, even in our operating rooms, where the temperature is artificially kept up, we often fail; and I think no one would, as a rule, like to compare the negatives taken in November with those produced on the brilliant days of May or June. However, that cold retards the development there can be no doubt; consequently, keep the developing solutions in a warm place, and if the temperature be very low, increase the amount of the reducing agent, without adding to the retarding agents—as acetic or citric acids. I do not think much is gained by warming the bath, and in some cases I consider it an evil. In out-door work, for example, if you take a plate from a warm bath into the cold atmosphere, you condense the moisture which is evaporated from the plate upon the lenses, and, of course, fogging is the result. In any case, I cannot see that anything is gained, more than a little time in forming the coating of iodide; and the old proverb, "Keep your feet warm and your head cool," as applied to photography, would be, "keep your developer warm and your bath cool," to which I will venture to add, by way of finishing this part of the subject—and your tempers also; for if your experiments are continued through November in London, depend upon it they will be severely tried.

We now notice some of the failures arising from defect in the chemistry of the process. Those we shall refer to at this time are:—*Alkalinity of the nitrate bath, acidity of the same, contamination by organic matter, weakness and excess of strength, and some also of the defects most commonly met with in the collodion and the developer.* Alkalinity may arise from various causes, such as using an alkaline collodion, or adding a solution of very highly-fused and alkaline nitrate of silver; but it will more often occur from an excess of alkali having been added in the attempt to correct acidity. Of all failures from a defective bath this is the easiest both of detection and cure. No one having seen a failure from this cause, will ever confound it with failure from others. (See plate 4.) Of course the remedy for this is to add acid in sufficient quantity to neutralise the bath. If for producing positive pictures, nitric acid may be used, but for negatives acetic acid will be found the best, as it to some extent favours density of the image. It is mostly recommended that the negative bath be kept perfectly neutral; and, if extreme rapidity be desired, this *must* be done; but for general purposes, both in landscape and portraiture, a trace of free acid in the bath will be found to give the best results.

Acidity of the bath next claims our attention. As before stated, a trace of acid in the bath will not be injurious; but, if an excess be allowed, a great loss of sensitiveness will result, the deepest shadows will be deficient in half-tone, and, if there be a *large* excess, the half-tints will be altogether lost.

In mixing a new bath, if a pure, neutral, nitrate of silver be used, one minim of glacial acetic acid to sixty ounces of bath solution will be found sufficient to preserve clearness and brilliancy. Plate No. 5 will give some idea of the effect of an excess of acid in this part of the process. If a very large quantity of acid be present, especially *nitric*, fogging may take place; but this will not often occur, unless it has been purposely added. To neutralise the free acid, either ammonia or carbonate of soda may be used, care being taken not to add an excess, especially of the former.

When a bath has been in use for a long time, it often becomes contaminated by organic matter, and almost saturated with ether. When in this condition, muddy lines will often be formed by the running down of the solution after leaving the bath. The best remedy for this, if the bath be not very strongly contaminated by organic matter, will be to take out, say half the old solution, and replace it by the same quantity of nitrate of silver solution, without the addition of iodide or acid. If, however, much foreign matter be present, it will be cheaper and safer to set the bath aside for other purposes, and begin afresh with a new one. A bath will often become acid by use, more especially if a collodion containing free iodine be used; this, in combination with the ether and other matters just noticed, often makes an old bath work so unsatisfactorily that it is generally better to reject it at once, and precipitate the silver for other purposes.

A bath used for exciting collodion should be used for no other purpose, and the fewer alterations and additions made in and to it, when once in working order, the better. It has been recommended that the plate should be coated with albumen before collodionising. I think this would spoil the bath as soon as anything, by making it

work more slowly, and eventually fogging to such an extent as to be perfectly useless. When a bath becomes contaminated by this, or by any other organic substance, a good shake up with a little kaolin will be found safer and better than rinsing or any other method of removing it. A bath which has worked so badly as to be quite useless, may often, by this means, be restored and made workable in a couple of hours.

With regard to the next point—the strength of the bath—I am aware there is a diversity of opinion, some recommending a strong bath, and others a very weak one. I prefer the first under most conditions, and generally keep it at from thirty-five to forty grains for portraits, in-doors, and from thirty to thirty-five for out-door work, though, if the temperature be very high, it may be advantageous to lower them five or ten grains. If a negative bath be allowed to fall below the strength just given, the pictures will be (with most varieties of collodion) deficient in half-tint and intensity (see plate No. 6), and no amount of care in exposure, &c., will enable the operator to produce a brilliant result. If, on the other hand, the strength of the bath be too great, the pictures will most probably be slightly foggy, and sometimes streaky, especially if allowed to remain long in a newly-mixed bath.

I think, in respect to failures from a defective bath, that a little *tact* is often better than a great deal of chemistry. Keeping the plate in motion will often remove streakiness, and early removal from the bath prevent fogging; and when this is the case, I think it unwise to tamper with the bath, more especially as it will often come round if left to itself.

The failures we shall next notice are those which may occur from bad collodion, or the improper use of good. It may be as well to state that I have usually procured my collodion ready made, and have, consequently, had no experience in its manufacture; therefore the defects I shall notice will be those most commonly met with in the commercial varieties, and of these I shall not attempt to suggest the cause, but simply confine myself to offering a few hints on their removal.

The defects most commonly met with are—*excessive intensity without half-tone; excess of half-tone without intensity; splitting up of the film on drying; glutinosity and over-iodising.* For the first mentioned I think sulphate of iron in development will be found generally the easiest and best remedy, if the collodion must be used by itself; but if any of that which is defective from excess of half-tone is at hand, it is advisable to try that of mixing them in various proportions: this will often be found successful, though not invariably. The restraining acid in the developer may also be diminished in quantity, and if these expedients, in combination with a full amount of exposure, do not give the required softness, it may, I think, be safely inferred that the sample of collodion is almost useless. Bromine has been recommended as diminishing the intensity and increasing the amount of half-tone, but as I have not tried this I can give no opinion.

The defect we next notice—half-tones without intensity—is, I think, much more rarely met with, and more easily remedied than the first. I would advise, when a collodion of this description is met with, that the effect of mixing with the first-named variety be tried, as before suggested. If this is unsuccessful, increase the quantity of acid in the developer; use pyrogallic in preference to sulphate of iron, for this purpose, and give a very short exposure.

I think that in this case, also, if these precautions fail to produce the desired effect, the collodion may be safely set aside as at least not first-rate.

Splitting up of the film in drying is the next defect we have to notice. It is not often, comparatively, that we meet with a collodion defective on this point. I think the best remedy will be found in adding a small quantity of alcohol, and allowing the film a long time to set before immersion in the bath. Care should also be taken to have the plates perfectly clean and dry before coating with collodion.

The use of a collodion too newly iodised is a very frequent cause of fogging, especially in out-door photography. (See plate No. 7.) Of course I need not point out the remedy here, but will merely remark that I prefer iodising about twenty hours before use.

Failures from old and partially decomposed collodion are more rare, as the liberation of free iodine generally warns us that decomposition has set in. In some cases, however, the characteristic colouration does not take place. A collodion iodised with cadmium will often become almost useless from decomposition (as I think) of the pyroxyline without changing colour to any great extent. In this case the only method of determining its age will be by its behaviour during development: if, after a full exposure (the bath, &c., being in proper order) it presents the appearance of plate No. 8, viz., great intensity in the high lights, the detail in the less illuminated parts being very faint, it may be safely set aside as useless, for the wet process at any rate; and none of the processes recommended for the restoration of sensitiveness have in my hands proved of any practical utility.

A glutinous collodion is not frequently met with in practice. I think it will mostly be found to occur in samples iodised with cadmium. In some cases the amount of glutinosity is so small as not to cause great inconvenience in coating plates of moderate size; while at others it will be present to such an extent as to preclude the possibility of obtaining an even film. I think the addition of alcohol will be found the best and readiest method of mitigating this evil. I say mitigating, because I doubt if it can be altogether removed, as it no doubt arises principally from the defective pyroxyline used in the plain collodion. The operation of coating should be performed as rapidly as possible, a large quantity of collodion being poured on and off quickly. At times thickening of the film will occur with a collodion which is not glutinous, especially in warm weather. For this defect, also, the addition of pure alcohol and perhaps a small quantity of ether will generally be found the best remedy.

The last defect we shall notice is that from over-iodising the collodion. I think this is a very frequent and prolific source of those small transparent spots which are so often seen in collodion negatives. (See plate No. 9.) The best way of removing these troublesome visitors is to add plain collodion till the defect is remedied.

In concluding these hasty and imperfect remarks on collodion, I would observe that operators generally do not take into consideration the fact, that a peculiarity which may at first sight seem a defect, may often, when skilfully applied, be made a positive advantage; and that any collodion, however good, may be made to produce, and indeed must produce, indifferent pictures if not properly applied. Of this I have seen many instances. An operator having a room lighted so as to give great intensity of light and shade will condemn a collodion similar to the first I have mentioned as totally unworkable, but will uphold the second as the best which can possibly be made; while another working with a very diffused light, giving a great amount of half-tint, will of course take the directly opposite opinion, and thus much difference exists betwixt tweedledum and tweedledee, both being right and both wrong, and the unfortunate manufacturers of the collodion are blamed because their preparations are not properly used or applied.

I do not think there is a collodion made which will render any and all subjects to perfection: one variety will answer best for portraiture, another for landscape. And when thus classified, other sub-divisions may often be made: one variety will perhaps render foliage beautifully, but totally fail if applied to architectural subjects; another will give fine results in foreground, but fail dismally if distance be required. I would, therefore, recommend all who work out of doors to provide themselves with several sorts of collodion; and I think that by so doing they will often secure a better result than if the precaution of adapting the collodion to the subject to be photographed be neglected.

May I suggest to those gentlemen who practice the dry processes the palpable advantage of preparing their dry plates with collodion of various kinds instead of as at present, each operator using one sort only for all purposes?

In the development perhaps the only matter of import is to use the developing agent quite fresh. A moment's consideration of the chemistry of this part of the process will convince on this point, and all the defects which theory would indicate as likely to occur will certainly be met with in practice. The iron developers are especially liable to decomposition and should therefore be used immediately after mixing.

I wish to call the attention of those gentlemen who practice the dry processes to the fact that Fothergill plates may be developed with the iron solutions. Mr. Leake, Sen., has developed some plates after exposure to gaslight under a negative, one of which I produce for your inspection. The process appears to me quite successful. I think that if dry plates can be developed in this way it may be advantageous—first, as giving a softer picture and shortening the time of exposure; and secondly, that it may, to some extent, obviate that frosty appearance so often met with. The plate before you is developed by iron alone, but I think that for negatives a subsequent intensifying with pyrogallic acid will be required.

I feel some hesitation in introducing the few remarks I have now to make on failures from defective manipulation on account of their very elementary character. I will not, however, detain you long on this subject. The first manipulatory failure I shall notice

is that from dirty plates. I suppose we all know, by painful experience, the effects thus produced. Perhaps soap marks are the most difficult of removal. We all know how interesting it is to see a huge figure eight looming through a negative during development, especially as the negative in question is sure to be in all other respects perfect. I produce a specimen of marking from that cause. Some glasses are more difficult to clean than others, and some will, I think, defy your most energetic efforts. Perhaps the best solution for cleaning plates is that recommended by Mr. G. W. Simpson, in a recent number of the Journal. I think that more failures occur from damp than dirty glasses, and would advise that the plates be always gently warmed before coating if the atmosphere be at all damp.

Imperfections in coating will sometimes occur. These are more frequent in hot weather, and generally consist of thickenings of the film at the end of the plate at which the collodion is poured off. (See plate No. 12.) This often arises from the evaporation of the ether during the coating of large plates in a warm room, and the best remedy is dilution with alcohol and ether, and coating the plates as quickly as possible.

By placing the defective end of the plate in the slide so as to receive the impression of the sky, when taking views, or the feet of the sitter in portraiture, this defect will often be lost sight of.

I think that as a rule there is not enough time given between coating and immersion in the bath. I like the collodion to have set enough to bear the impression of the finger on the lower edge, and I think few failures occur from allowing too long a time in this part of the process, except the temperature be very high.

If the plate be removed from the bath too soon, greasy marks will occur from the solution running in lines upon the plate (see plate No. 14); but if, on the other hand, it be allowed to remain too long in the solution most likely fogging will result. Some persons recommend a long immersion; I cannot see that any thing is gained by keeping the plate in the bath after the film of iodide is formed, but have often found it a positive disadvantage in hot weather or when working in a tent. I think it a great mistake to use a bath which contains so small a quantity of solution. I prefer one in which a large number of plates can be coated without necessitating any addition of fresh solution, and which is sufficiently large to allow the plates to be immersed without cornering, as any hesitation in this operation produces a line similar to those on plate 13. Upon removal from the bath the plate should be well drained, and the back and top edge dried with blotting paper in order that the solution may not run down, as this would produce muddy lines. (See plate 15.) I think it a good plan to lay a sheet of blotting paper quite over the back of the plate when placed in the slide: this keeps the slide dry and clean. It is a common mistake to suppose the plate must be exposed directly it leaves the bath; if the weather is cool and the plate be carefully drained, fifteen or twenty minutes may be allowed to elapse between exciting and developing, though, of course, these operations should follow each other at as short an interval as convenient.

On leaving the dark room the slide should be covered with a cloth, as a precaution against stray light, and this should not be removed until the plate be safely deposited in the dark room after exposure. The fault most often met with in collodion negatives is under-exposure. An insufficient exposure necessitates a long development, and this produces that snowy appearance we so often see in foliage, especially if the development be pushed with nitrate of silver. I like, if possible, to expose, so that one application of the developer is sufficient to bring out the detail in deepest shadow. Of course if an insufficient exposure be given, the detail in the shadows will not be rendered (as is the case in plate 16); while if it be excessively prolonged, the lights and shadows will appear at once, on the application of the developer, and there will not be sufficient contrast between the lights and shades in the finished picture. (See plate No. 17.)

It is always advisable to shield the lens from the direct rays of the sun, by placing a funnel or by holding a piece of cardboard over it. I do not like too small a stop, as I think the smaller the stop the more flat will be the picture; of course within certain limits.

In developing failure may arise from several causes. I think over-development is of these the most frequent, and excessive intensity is the result. (See plate No. 18.) Under-development, on the other hand, gives an insufficient amount of intensity, and the picture is red, weak, and more or less defective in the shadows. (See plate No. 19.) Of course the remedy for these failures is obvious. In pouring on the developer care should be taken to let it cover the plate at one sweep, as the least hesitation will produce a stain; and also to have sufficient alcohol to make it flow easily. If developing views I prefer pouring the solution on at one corner of the sky, as a slight loss of intensity at this part of the picture is of no importance, and in portraiture I prefer developing from the feet of the sitter.

Much depends on judicious development, and a great deal of effect may often be produced by pouring the developer on, or keeping it off one part of the picture, as more light or shade be desired.

The only precautions to be observed in fixing are, to be careful the solution of cyanide is not to strong, and that if hyposulphite of soda be used, that it is thoroughly removed by the subsequent washing.

I exhibit a specimen of the injurious effect of leaving any of the fixing agent on the plate. (See plate No. 22.) I think a weak solution of cyanide is preferable to hypo', as it is quicker in its action and more easily removed by washing.

I have now, last of all, to call your attention to some varnishes at present in the market, which, if not carefully used, dissolve the picture entirely out. I believe the remedy here is warming the plate before applying the varnish, but I think it would certainly be safer to reject it at once. I produce a specimen of the effect produced by this varnish, (See plate No. 23.)

I have now, gentlemen, only to thank you for the kind attention you have paid to a paper which I fear is "flat, stale, and unprofitable" to most of you, and to hope that a bad paper may lead to a *good* discussion.

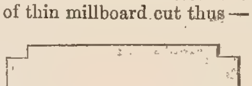
PHOTOGRAPHERS THEIR OWN ARTIFICERS.

By Thomas Gulliver.

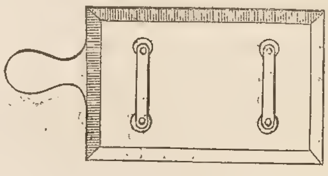
No. III.

DEVELOPING TRAY PLATE BOXES, &c.

To complete the fittings of the tent described in No. 104, we require two plate boxes, made specially for wet plates, and a developing tray. The grooves for the plate boxes should be of the V shape, which are easily made thus:—Buy a three-eight inch rabbet plane, and make a gauge line down the centre; then plane away each side to the required angle, and grind the plane-iron to fit; and having selected a straight-grained piece of wood, divide it with the compasses into regular divisions, and sprig a straight-edge on to the piece at the first division. It will be desirable to screw a strip of hard wood on to the side of the plane to secure an equal depth of groove. Having worked out the first groove, shift the straight-edge on to the second division, and so on till the required number are complete. The two ends of the plate box should be worked out of ⅜-inch stuff, and should be 8¼ inches long by 1⅝ wide. The sides should be of a ¼-inch, 8⅜ inches long by 7⅝ wide. A box of these dimensions will contain six plates 8½ inches by 6½. Two of these boxes will be wanted for the tent — one for clean plates and the other for the negatives when taken. The boxes should be well varnished, and made smooth inside to allow of their being washed out after use, as the syrup used to keep the plates moist is apt to collect dust. The boxes should be fitted with lids, which may be easily made out of thin millboard cut thus —



the sides to be turned up and paper pasted over all. When dry, varnished. An elastic band passed over the box and nailed up at the bottom of it will keep the box lid in place, and will be found more convenient in practice than boxes with hinges. The deve-



loping tray should be 9½ inches by 7½ outside measure, the ends ½-inch, and the sides and bottom of ⅜-inch wood. The handle must be placed a little to the left of the centre. Two small strips screwed on to the bottom serve the double purpose of making it stronger and to hold the plate while it is being developed; and, as additional security, two round pieces of vulcanised india rubber are fixed on to each strip. The tray inside need not be more than

three-quarters of an inch deep, and the strips half an inch. The sides should be bevelled off towards the centre, and the whole tray well varnished.

The rest of the fittings will be a small case, to contain two two-ounce bottles of collodion, and two four-ounce ones of developer, a small bag for a wet sponge made of waterproof material, and a plate-holder.

The camera is made portable and contrived to go inside the tent, and in weight is very much lighter than those in general use. I will send a description of it in my next.

The whole of the apparatus is intended for plates 8½ inches by 6½, as that size will be found most convenient for ease of manipulation and printing, as the sheets of printing paper cut into six each without waste.

I enclose a print of Oystermouth Church on plain paper, in which you will see the genuine effect of light given in the sky and over the building by using the proto-sulphate of iron developer.

[The photograph received is sharp and clear, well printed, and nicely toned—but a trifle *too cold*. We prefer the sky to be a *little* brighter, not white, but scarcely so leaden in hue.—ED.]

ON FIXING POSITIVE PROOFS.

By MM. DAVANNE and GIRARD.

(*Continued from page* 22.)

ON THE ACTION OF VARIOUS FIXING AGENTS ON THE PROOFS.

THE agents employed for fixing positive proofs are the most energetic solvents of the salts of silver — hyposulphite of soda, cyanide of potassium, and solution of ammonia. The solvent properties of the cyanide, however, are so energetic, that it is dangerous to employ it. To make use of these fixing agents, they are dissolved in water in varying proportions, and the proofs immersed in the solution when taken out of the printing frames. It is a good plan to wash the proofs in clean water before putting them into the fixing solutions, to remove the free nitrate of silver, and allowing only the chloride to remain. Water, although, strictly speaking, not a fixing agent, still performs an important part in the operation of fixing; and, in the first place, we must inquire if this liquid fulfils the aim proposed — that of dissolving all the free nitrate of silver. Now, when we immerse a sheet of paper in a solution of nitrate of silver, and without exposing it to light, we attempt by a washing in distilled water to remove all the argentine salt it retains, we perceive that the solution, although considerable, yet is not complete. The sheet of paper, however long we may prolong the washing, takes, under the action of light, an uniform grey tint, indicating a reduction of silver. Doubtless a portion of the nitrate of silver is decomposed by the salts always contained in the papers, and forms in the pulp of the paper insoluble argentine compounds, which the light afterwards attacks. Besides, the quantity of salt of silver remaining, and consequently the reduction, are both very feeble, so that in the ordinary processes of photography, where the true fixing agent must intervene after the water, this method, from the advantages to be shown in the sequel, must be strongly recommended. But water, if employed alone, is but an inefficient fixing agent, even when the paper has been prepared with soluble salts only.

This fact established, we will next examine the manner in which each of the three fixing agents proposed, under three different points of view, as enumerated in the previous chapter.

1st. The first question that presents itself is — Does the fixing agent remove all the compounds upon which the light has acted?

To verify this fact, after preparing some sensitised paper in the usual manner, it is allowed to dry, then passed through the several fixing agents; and then examined to see if, on the one hand, the papers thus fixed are still sensitive to light, and on the other, if analysis can detect the presence of silver. By proceeding in this manner, we recognise that cyanide of potassium, in the proportion of two parts to one hundred of water, left no insoluble compound; that hyposulphite of soda and ammonia acted in the same manner upon ordinary sized papers, but that the fixing agents left upon the albumenised papers a small quantity of silver susceptible of becoming slightly coloured under the influence of light.

These results are of some importance; if the first were but little known, it was not the case with the last. They show that it is difficult to remove the last traces of the silver salt from an albumenised proof, and consequently explain the difficulty photographers experience in obtaining pure whites upon albumenised paper.

2nd. We now arrive at the most difficult and important question in the subject. It may be stated in the following terms: — Does the fixing agent leave in the proof any substance susceptible of producing an alteration, either immediate or remote? Ammonia, employed in solutions of different strength, always exercises a special action upon the coloured portions of the proof. Every photographer must have been struck with the peculiar tone presented by proofs fixed by ammonia, which always exhibits itself under whatever state the ammonia has been employed in the course of the process. It is true, that the swelling of the sizing by the ammonia, and consequently the hydration of argento-organic material, readily explains why the violet hue changes into a red hue; but it does not explain why the hue of the combination so produced is distinctly different from that obtained when the fixing is performed by hyposulphite of soda, for example. The following facts will doubtless account for this interesting phenomenon.

When we expose to the light a liquid containing chloride and nitrate of silver, starch and ammonia, there is formed, as upon the proof, a compound of silver and organic matter; but this compound contains ammonia.

If we take the argento-organic matter obtained by the contact of chloride of silver, nitrate, and starch, and after "fixing" it with hyposulphite of silver, let it become quite dry; then put it in contact with ammonia, it immediately changes its colour, and takes that assumed by proofs fixed with ammonia. If, after repeated washings, we examine the precipitate thus obtained, we discover that it contains ammonia in a state of combination.

Lastly. A proof fixed entirely in hyposulphite of soda, then immersed in ammonia, changes in hue, and assumes the tint of a proof fixed in that alkali.

These facts are conclusive: they prove that in the process with ammonia, this base interferes in a special manner, combining with the argento-organic matter, at the same time it affects the fixing, and consequently, like a dye, influences in a particular manner the colouring of this substance.

Ammonia, therefore, leaves in the proof a small quantity of its substance. This result is important, inasmuch as it explains the peculiar colouring of the proofs fixed in this manner; but with respect to alteration, the quantity of ammonia fixed upon the proof appears absolutely insignificant.

(*To be continued.*)

Meetings of Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE usual meeting of this society was held on the 19th ult., at the Golf Club House, when, after the ordinary formal business,

Mr. SKAIFE read a short paper on *Photographic Instantaneity*, by way of introducing to the meeting his new photographic instrument, which he calls a Pistolgraph. After explaining its construction, the inventor gave a practical illustration of its working, by taking two or three rapid photographs of one of the gaslights. All of the plates which he excited, developed, and fixed, was by plunging each successively into three little jars, containing one ounce and a half of fluid each. He then explained how, by superposition, a transparent positive was taken sufficiently defined to yield by one operation of enlargement a *negative* from ten to fifteen times the diameter of the original photograph — half a dozen successful examples of which, plain and coloured, were handed round to the members for their inspection, together with two or three cases of photo-pistolography, chromo-crystallised, inincluding a view of the last Greenwich election, a boat scene on the Thames, and sundry portraits of dogs, horses, and children, the novelty and beauty of which elicited repeated expressions of admiration, coupled with surprise that such a *pistolette* should have been capable of producing them.

To a question put by a member, why the machine was called a pistolgraph instead of a camera, Mr. SKAIFE was understood to say, because, amongst other reasons, the instrument, with the exception of its lenses, had nothing in common with ordinary photographic cameras — so named rather from their outward shape than otherwise to the camera-lucida invented some three hundred years ago by a Neapolitan *savant*.

The CHAIRMAN, in proposing a vote of thanks to Mr. Skaife, observed, by whatever name the instrument was called, its performances indicated a competency to realise more satisfactory portraits of children than any other photographic camera known.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual meeting of this society was held on Thursday, the 19th ultimo, at the Lecture Hall, Carter Street, Walworth; the Rev. F. F. STATHAM, B.A., F.G.S., President, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. G. S. Tear presented two excellent prints from negatives, produced by himself — one, a landscape, by Hockin's modification of the Fothergill process; the other, a portrait, developed with iron, possessing great beauty of definition and softness, but in the drapery only somewhat deficient in vigour.

Mr. Squire presented a set of his recently-published stereographs of sea waves. These were of a very interesting description, representing the tumbling waves in the act of breaking into foam upon a shingly shore.

Mr. Leake, Sen., presented some transparent stereographs.

The Photographic News Almanack: A copy of this useful little work was kindly presented by the Publishers.

A specimen of the society's Presentation Photograph was handed round for inspection. It had been selected by the appointed sub-committee from a very fine collection by Bedford, and was, as a photograph and a picture, equally meritorious. The subject of the print chosen is a view from the eminently graceful and interesting ruins of gothic architecture, Tintern Abbey, and represents the silently decaying grandeur of the beautiful nave arcade, with its tall range of symmetrical pillars and noble arches, half concealed by the picturesque, because not too closely cut, ivy; and its scattered fragments of sculpture and cunning work crumbling into dust amid the grass, weeds, and creeping plants below. The small quantity of white in the picture is in harmonious keeping with the dim religious gloom which, associated with so much solemn glory and departing magnificence, is eloquently expressive. The lightest portions of the picture being massed together on the right, and blending gradually into the more subdued lights and deeper shadows grouped on the left, secures the valuable quality—breadth; nevertheless, the utmost perfection of detail exists on either side; and a painter may find a day's profitable study in every square inch of this very beautiful photograph.

Much satisfaction was expressed upon inspecting the above.

The discussion on Mr. Keens' paper [see page 10], postponed at the last meeting until this evening, was opened by the Hon. Secretary, who said: — I don't know whether Mr. Keens is conscious of having run foul of so eminent an authority as Sir David Brewster, in boldly asserting that "a good photograph will give a faithful representation of the subject with due proportions," but he certainly has. Theory and practice, immaculate apart, when contrasted sometimes reveal contradictions of a very puzzling character; and the present is, I think, a case in point. By careful measurements, we artists have obtained certain scales of proportions by which figures have been drawn universally acknowledged to be accurate representations. Mr. Keens has applied these identical measurements to well proportioned figures produced by photography, and proved to us at our last meeting that they would bear this test. Now, in opposition to Mr. Keens' assertion, Sir David Brewster has emphatically said that the ordinary photographic image is, from the size of the lenses used, *perceptibly* disproportionate — that, to quote his very words, "However perfect the glasses of which its lenses are composed, however accurately the spherical and chromatic aberrations of the lenses are corrected, and however nicely the chemical and luminous foci are made to coincide, the photographic camera is *utterly unfit from the size of its lenses alone* to give accurate representations of living beings, and of all objects in relief, whether single or in groups." Thus, then, stands the matter. Now, gentlemen, I am not competent to treat this question scientifically, but I will nevertheless presume to put forth a few suggestions.

The arguments used by Sir David Brewster are doubtless too well known to you to need recapitulation, and you will at once recognise the points to which I intend my very humbly-tendered suggestions to apply.

In the inconceivably minute fraction of a second light impinges upon the retina, and there forms the images of external objects; but it is not less than the tenth part of a second, I believe, which elapses before a consciousness of the impression reaches the mind. Is it not possible, then, that the lens of the eye, continually varying its aperture (and consequent curve), and by instinctively, or unconsciously, moving from right to left when turned by the will towards any object, may embrace more views, or admit many more dissimilar images, than are generally allowed, and in this case the optical image and the photographic may be more closely allied than Sir David admits. It seems to me, also, that the simple fact of our receiving impressions (by no means identical) through two lenses at a distance of about two and a quarter or two and a half inches apart, has not been sufficiently considered in our great optician's theory. As a properly focussed portrait, taken with a perfectly corrected achromatic lens, does not offend the educated eye, and will bear the test usually applied to drawings for ascertaining the correctness of their proportions, I at any rate shall dare to uphold the truthfulness of any photographic portrait which does not outrage the common principles of our art, and has been taken with the best instruments. With reference to Mr. Quin's diagrams, although Mr. Keens appeared to forget that they could only be applied to objects taken on a plane surface, or lines upon an imaginary plane, they illustrated a very useful optical principle.

The President said, Mr. Wall having opened the discussion, he trusted members would at once take up the subject (which promised to be useful), as they had a paper to follow. Although Sir David Brewster was in theory undoubtedly correct, there was one fact which appeared to be left unexplained, viz., that living objects looked at through lenses (opera glasses, &c.) suffered no apparent distortion, although great distortion, it seems, must exist. He thought a brief *resumé* of the paper under consideration by Mr. Keens would be of great assistance to such members as were not present at the last meeting.

Mr. Keens rose to carry out briefly the suggestion made by the President, and alluded to the inutility of mere theorising when untested by practical experiments.

Mr. Wall had purchased and laid upon the tables several journals for the use of members desirous of referring to Mr. Keen's paper.

Mr. Keens, speaking in reference to Mr. Quin's diagrams, explained the point of sight in perspective drawings as the focus of sharpness, and stated that all objects removed from that point were, in proportion to their distance, out of focus.

Mr. Herve said no photographic image could be absolutely correct not taken upon a curved surface, and recommended curved glasses, as used by Mr. Ross in one of his experiments, explaining the form of the retina in connection with the outer lens of the eye as a reason for doing so.

Mr. Leake, Sen., remembered trying to obtain correct copies of some plans by one of Lerebour's lenses, and then found so much distortion as to render its productions useless.

Mr. Hannaford: A print or mass could not be copied with the ordinary lens: the triplet and the orthographic would give the best copy. With reference to Mr. Quin's diagrams, he thought the experiment would have been more satisfactory had the figure and the photograph been in point of size perfectly identical.

Mr. Herve pointed out the want of sharpness in portions of the lines in Mr. Quin's diagram as evidence of distortion.

Mr. Wall said the question before them was not one of mere sharpness, but of absolute distortion, such as would destroy accuracy of representation.

Mr. Herve: A want of sharpness is distortion.

Mr. Wall: Although the want of sharpness might be, logically and optically, distortion, he still thought absolute distortion, in the sense more commonly understood, was a very different matter.

Mr. Quin did not think indistinctness and distortion one and the same thing, and pointed out in the distorted diagram that parts were very distinct, although distorted, and other parts very perfect in their relative proportions, although not distinct. Mr. Hervé should confine himself to the subject more immediately under discussion, viz., proportion.

Mr. Wall had tried an experiment recommended in one of Sir David Brewster's articles on this subject, by using (with a portrait lens) a stop having five apertures; and, when in focus, the difference between the image produced by the marginal pencils and that produced by the centre — apart from the simple brilliancy ensured by the larger amount of light and some small degree of sharpness — was so slight as to defy detection.

Mr. Herve inquired if Mr. Wall had taken pictures of images so produced, because then they might judge for themselves.

Mr. Wall had not done so, having but little time, and not too much light to spare, for experiments just now.

Mr. Leake produced a diagram which showed the thickening of the lines consequent upon the curvature of the lens affecting the intersection of the rays. In reference to Mr. Quin's assertion about cocking the camera when raised to the breast of the figure, Mr. Leake thought this the proper position for the camera when taking whole-length figures, and explained his reasons by exhibiting a large and carefully-drawn diagram.

Mr. Herve made some remarks to the same effect.

Mr. Hannaford: The most correct proportions were obtained by enlarging from small negatives, which could be best done with the orthoscopic lens, as he thought the inward curvature of the lines obtained by the old form of lens might be corrected by the slight outward curvature of the orthoscopic.

Mr. Quin thought the diagrams being his bantlings he had some right to defend them, and proceeded to state that they were taken very hurriedly, when the light was so bad that he really could not see whether the images on the ground glass were sharp or not; but although the lines were slightly blurred, the proportions of the diagram under discussion were quite perfect.

Several other remarks were tendered, and the discussion grew very animated.

The President thought they might now bring this discussion to a close, and call upon Mr. Leake for his paper. As in the old tale of the chameleon, they were, he thought, all right and all wrong. Mr. Wall had referred to the construction of the eye, and some peculiarities of the sense of vision. In seeing objects we were so greatly assisted by the associated ideas of the mind in arriving at correct notions both of form and surface, that it was difficult to define exactly how much was due to the image formed on the retina. For his own part, he thought he could demonstrate that images received into the eye must necessarily be distorted. The amount of aberration discoverable in photographic portraits seemed to be so small as not to affect their truthfulness to at least any serious extent. As to its superiority in this particular over art, being a clergyman he had frequently been requested to sit for pictures by local artists, and had found that from this source just so many pictures, just so many *un*-likenesses; but photographic portraits, whatever their other faults, were always like.

Mr. Leake, Jun., was called upon to read his paper on *Failures in the Wet Process: their Cause and Cure.* [See page 34.]

At the conclusion of the above paper,

The President said Mr. Leake's failures were, he thought, very successful, and he regretted that so little time remained in which to discuss the paper, and hoped the discussion would be postponed in order that they might study it in detail when printed, and come to the next meeting fully prepared to enter into the subject.

Mr. Hannaford thought in justice to Mr. Leake the discussion had better be postponed, as it certainly needed more time than they could that evening give it. Again, many failures not enumerated might be brought forward at the next meeting, and in the interval some experiments of an useful nature might be tried. Mr. Hannaford then referred to the use of an iron developer, exhibited a specimen of a Fothergill plate developed with iron and pyrogallic, and thought the advantage gained was that it brought out details with greater perfection.

Mr. Howard inquired if this reduced the time of exposure, and how much acid would Mr. Leake consider sufficient in the bath?

Mr. Leake, Jun., thought test-paper was not sufficiently sensitive for the detection of acidity. He had known baths to be acid when test-paper did not change after twenty minutes' immersion. The best way of restoring the bath was to render it slightly alkaline by carbonate of soda, adding acetic acid in very small quantities until a clear result was obtained.

Mr. Tear had used the iron developer with both an acid and alkaline bath with equally good results.

Mr. T. Clarke expressed a similar opinion.

Mr. Hannaford did not think the iron developer reduced the time of exposure.

Mr. Howard agreed with Mr. Leake as to draining the plate. He always got better detail by using iron than pyrogallic alone; and found that in portraits generally there was too much intensity.

Mr. Quin could quite bear out the observations Mr. Leake made in reference to the use of iron in cold weather; but thought the pyrogallic would, in warm weather, develop as quickly as iron. He sometimes found great peculiarities in the quality of light—one light producing a negative best developed with iron, when the pyrogallic was a failure. He thought a weak solution—two grains to the ounce—best.

Mr. Tear considered that an iron developer gave a shorter exposure both in winter and summer.

Mr. Leake, Jun., said the greatest advantage obtained by using the iron was that it enabled you to push the development so as to secure all the details in the shadows without that excessive intensity, destructive of the more delicate gradations, in the lights.

Mr. Hannaford very much regretted that Mr. Hughes was not present, as he had heard that gentleman at the North London Association make some remarks upon the iron developer which were the best he had yet met with; and hoped that Mr. Hughes would be present at the renewal of this discussion.

Several gentlemen promised to bring specimens of failures at the next meeting. A vote of thanks was awarded to Mr. Leake, Jun.

The President then announced that a paper had been promised by Mr. T. Clarke upon the improvements recently made in photographic apparatus, and invited any gentlemen present, whether members or not, to bring down to the next meeting any specimens of improved apparatus they might possess.

Mr. J. R. Silstone was duly elected a member.

A vote of thanks having been awarded to the chairman, the meeting then adjourned.

LIVERPOOL PHOTOGRAPHIC CLUB.

The second meeting for the current year was held at the residence of Dr. Cauty. There was a full attendance of members, and the *séance* was graced by the presence of several ladies.

Mr. Cook, in confirmation of his testimony in favour of waxed-paper at the last meeting, brought with him a portfolio of his negatives, selected at random from his ordinary stock, and a better production could not have been desired: for clearness of outline, minuteness of detail, and translucence of the medium, they certainly left nothing to be wished for. The heaviness of glass, with its brittleness, and its unlucky uncertainty of preservation in other ways was fully expatiated on by Mr. Corey, who related that the whole of his last stock of beautiful negatives of Furness Abbey, which were only taken last September, on being recently examined, were found split up into those arborescent form for which some kinds of varnish were so detestably famous, and were irretrievably spoiled.

Mr. Cauty exhibited some very fine specimens of prints, from enlarged negatives, taken from microscopic objects by Mr. Wenham; and these were pronounced to evince great progress in the utilitarian principle of photography, as those to whom the luxury of a microscope was denied could see the structure of the most infinitesimal objects with the naked eye. The *navicula angulata*, the delicate markings on which none but the highest-priced instruments could reveal, was enlarged to the size of an egg; the *antennæ* of the moth the tongue of the spider, the teeth, or, more properly, internal structure of the gizzard-like organ of the tadpole, were beautifully displayed, whilst laminated sections of the spine of the hedgehog, and tooth of the rat, showed the structure of their osseous condition wonderfully well.

Very great interest was excited by the exhibition of a large collection of plates by the long-neglected and ill-appreciated process of Daguerre. Mr. W. G. Helsby, who had resided for a long time in South America, had brought some truly brilliant reminiscences of his sojourn there. They are all full-plate size, and remarkable for their high finish and perfect preservation. He took occasion to point out that there was no process at present known that was equal to the Daguerreotype for the delineation of every salient point in the perspective, however distant or near at hand; and certainly many of the sierras were represented in their wild and trackless vastness with frightful fidelity.

Arequipa, a large city at the base of a volcano, was beautifully and tastefully rendered, with an evening light, artistically chosen, gilding all the prominent buildings; Tia Yuanaca, a flourishing city, but which was known previously to have existed as a vast ruin, three hundred years before the invasion of the Spaniards; Puno, a city of Bolivia, with its church built by the Jesuits from the ruins of the original Yuanaca, where the natives were in so deplorable a state of destitution that the fee of one dollar demanded by the ecclesiastics for the burial of their dead was beyond their means, while a very unhealthy season with its consequent sickness, and concomitant death was raging. A striking contrast was afforded by the halt of the caravan in the wilderness, with only a few roofless walls of loose stones to protect the wayfarers from the bleak driving wind, and the comforts of the yard of Jack Brothers. In this picture the ordinary beast of burden, viz., the lama, a large and somewhat spiteful animal of the goat or rather alpaca tribe, excited great attention. Much regard was also given to the frozen lake, Las Lagunillas, 13,000 feet above the level of the sea, the waters of which are unceasingly chained up in "thrilling regions of thick-ribbed ice," the warmest day in summer having power only to dissolve the charm at its merest edge, and for only one hour in the day.

Mr. Forrest congratulated the members that after long continued efforts he had succeeded in establishing a recognised position for the art of photography among the fine arts in Liverpool. He had persistently represented to the Liverpool Academy the strong claims there were for a certain portion of their exhibition of choice specimens of this art; but with no satisfactory result. The Society of Fine Arts, however, had favourably considered his appeal, and allotted a certain portion of their wall space in the forth-

coming spring exhibition, and he now called upon the members and practitioners of the art at large, to aid him manfully in upholding its dignity, by sending for the purpose their choicest specimens. He would be happy to afford particulars on application.

A resolution, received with acclamation, to accept Mr. Bell's invitation for the next meeting, closed a delightful evening.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Wednesday, the 11th ult. Mr. Nicholson, Vice-President, occupied the chair. The minutes of the last meeting were read and confirmed; two gentlemen were then elected members of the Association; after which

The Chairman announced that the next business would be Mr. Hooper's paper.

Mr. Hooper having made some preliminary remarks on the superior advantages for out-door photography, which processes on paper possessed over those in which dry glasses were used, in respect of portability, &c., thus proceeded :—

On the Turpentine Waxed-paper Process.

Having been requested by several members who have seen the pictures obtained by me with the turpentine waxed-paper process to give the society a short account of my operations, let me remark that I do not come forward as the claimant of some new and grand discovery, but simply to lay before you in detail that method which, after long experiment on nearly all the paper processes which have been published, I find gives me the most uniform and satisfactory results.

With several of the formulæ I have been able to obtain fair negatives, but most of them gave thin skies and were very slow in the camera. It therefore became desirable to obtain an increased sensitiveness, combined with density; and I am glad to say that in these respects, I have succeeded. I will not occupy your time by entering into the details of my experiments, but proceed at once to state how first-rate negatives are to be obtained by the turpentine waxed-paper process.

Almost any paper will answer; but I find my best negatives are on papier saxe, and that can be got of a good quality from any respectable dealer in photographic apparatus. Having selected the paper, cut it to the size required, and mark it at one corner on the right or smoothest side with a pencil, as it is important in the iodising and sensitising operations to float the marked side first on the solution before immersion.

The first iodising solution I make, as recommended by Mr. Sisson, by dissolving one ounce of wax in twenty ounces by weight of turpentine or camphine. I prefer the latter. *Pure* wax can be had from Messrs. Brecknell and Turner, Haymarket, London. Place the bottle containing the wax and camphine in hot water, or in a warm situation, until all the wax is dissolved; then allow it to get cold, filter, and add by small portions at a time two drachms of pure iodine (the addition of castor oil, recommended by Mr. Sisson, I omit). After standing a few days, some wax will probably be thrown down. This only requires to be filtered out, and it is then ready for the first iodising of the papers. A porcelain dish, with a flat bottom, answers for this purpose. The solution is poured into the dish, and as many papers immersed as it will cover. Glass rods should be used for immersing the paper in this or subsequent operations. When a sufficient quantity have been immersed at once, turn them all over together, so that the first put in will be at the top. They are then taken out one by one, and hung up by a wooden clip to drain over the dish or any convenient receptacle, and when sufficiently drained suspended in a place free from dust to dry. The dish has only to be emptied, drained, and tied up in paper to guard against dust, &c., to be ready for use at any future time, without any preliminary cleaning, which, if really necessary, would be difficult to accomplish.

When dry, the papers are ready for the second iodising, the solution for which is composed as follows :—

Serum of milk	20	ounces.
Iodide of potassium	420	grains.
Bromide do.	60	„
Chloride of sodium	20	„

And iodine a sufficient quantity to give it a dark sherry colour. First float and then immerse eight or ten quarter sheets. No greater number should be placed in the quantity of solution named at one time.

It is not necessary to filter this solution, but care must be taken not to pour into the dish any sediment there might be at the bottom of the bottle in which it is kept. Air bubbles are to be avoided in this and all subsequent operations.

The papers may remain in this iodising solution from twenty minutes to one hour, after which take each out separately, slightly drain, then blot off in a blotting-paper book; one such book, with about twenty-four leaves, can be used any number of times, and will serve a whole season.

I have used papers that have been iodised this second time above twelve months, and do not find that they deteriorate by keeping that length of time: this is an advantage, as a stock may be prepared in winter for the next season's work.

Papers thus prepared are ready at any time for sensitising.

The solution for this operation is composed of—

Water	10	ounces.
Nitrate silver	400	grains.
Acetic acid	2½	drachms.
Lemon juice	1½	„

To be *saturated* with iodide of silver.

The dish I have used for the second iodising I also employ for the sensitising, and for no other purpose.

To sensitise a paper, float it on the sensitising solution, face downwards, until the dark colour the paper acquired in the second iodising begins to disappear, then either immerse or turn it over, so as to bring the other side in contact with the sensitising medium; as soon as it has acquired an uniform primrose colour take it out, slightly drain, and place it in a dish containing four ounces of water for every quarter of a sheet intended to be sensitised; thus supposing six papers of the size stated are required, pour twenty-four ounces of water into the dish, and at once immerse the slightly-drained sheet, in order to wash off the excess of silver, and make the paper keep better; sensitise another as before, place it also in the washing dish, and proceed in this manner until the six papers are in the twenty-four ounces of water; shake the dish well after the immersion of every sheet, so as to thoroughly wash the paper; they are then to be transferred to another dish containing the same quantity of water, and well washed as before—drain, blot off in a blotting-paper book (which will serve a whole season, like the iodising book), hang up, and when dry, they are ready for exposure. The same caution must be observed with respect to keeping white light from these papers, as with a collodion plate, the paper when wet being extremely sensitive. To prepare the papers for exposure, wafer them by the corners to some Bristol board, and place them at once in the dark slide. With the washing I have named the papers will keep eight or ten days in summer, and much longer in cold weather.

The exposure required with a lens of sixteen inches focus, and five-eighths stop, will be from seven to twenty minutes, depending on the light and object.

To develop float the paper on a two-grain solution of gallic acid, with one drop of a thirty grain aceto-nitrate solution added to each ounce, until the details of the picture begin to appear, then immerse it; and if there is more than one to develop, as soon as the first is immersed float another, and proceed as with the first: in ten ounces of solution four-quarter sheets may be developed together. As soon as all are immersed, add a few drops more of the aceto-nitrate; the pictures will then intensify rapidly if properly exposed in the camera. When sufficiently intense, wash and fix as usual.

The papers being impregnated with only a small quantity of wax in the first iodising, it will be necessary to re-wax them when finished in the manner generally recommended for the ordinary waxed-paper process. I would recommend amateurs who have never tried any paper process, but who purpose following this out, to prepare only small papers, say stereo size at first, and print on them from a negative by gaslight in the pressure frame, until the picture is slightly visible, and then develop. As soon as accustomed to the small size, prepare larger, and proceed to out-door photography.

It would also be advisable to have a large bottle containing salt and water, into which waste silver solutions washings of baths, &c. (not solutions containing hypo' or cyanide), should be poured, and the resulting chloride afterwards reduced. The waste prints and clippings should also be set aside, burnt and reduced to metal. It is astonishing the amount of silver that may be thus saved, even by those who, like myself, do not follow photography professionally. I have here eight ounces of pure silver saved by the first method, and one-and-a-half ounces from clippings of positives, experimental negatives, &c. I would also lay great stress on the necessity of using clean dishes for sensitising, developing, &c. In the process I have described, with clean dishes and proper exposure, failure is impossible.

Mr. WARDLEY took objections to some of the details expounded by Mr. Hooper. Extra trouble was involved in this process as compared with the waxed-paper process. He considered the employment of camphine was needless as a solvent for the wax, the paper still requiring waxing after fixing, which was performed in one operation in the old waxed-paper process. He also thought the iodising solution too strong, as it involved the use of an unnecessarily strong nitrate of silver bath; he also considered that cyanide of potassium was required in the iodising solutions, as it rendered the wax more permeable to the solutions, and increased sensitiveness was obtained thereby. He preferred the serum prepared by acetic acid to that prepared by lemon juice, believing that an acetate of potash or soda was formed in the serum, which, combining with the nitrate of silver, formed an acetate of silver, which becomes an accelerator.

Mr. GRIFFITHS thought there was no acetate of soda or potash formed, as there was no soda or potash in an uncombined state in the milk with which the acetic acid would combine; he thought there might be other chemical action to account for the increased sensitiveness which it was alleged took place.

Mr. HOOPER, in reply to Mr. Wardley's objections, stated that by using camphine as the solvent the purest part of the wax only was retained in solution, the impurities being thrown down, and this he believed was the chief element of success in this process, as it obviated the granulated appearance complained of in the other method of waxing, which he thought arose from the filling up of the pores of the paper with crude wax, thus necessitating the use of cyanide of potassium to enable the solutions to penetrate the substance of the paper. As to the strength of the iodising solution, that might be reduced one half, but the exposure would be nearly doubled in consequence, and if care be taken to preserve the washing and fixing solutions, no extra loss of silver is sustained. He admitted that Mr. Wardley had produced excellent pictures by his method of working, which he attributed to his skill in manipulation, whilst by the method he advocated equal results might be obtained by less practised operators.

Several other members having spoken,

Mr. WARDLEY paid a compliment to Mr. Hooper for the success of his experiments, and for his interesting paper, and begged to move that the thanks of the meeting should be given to that gentleman, which was seconded, and carried unanimously.

A vote of thanks was also passed to Mr. Nicholson for his conduct in the chair.

Mr. Wardley exhibited twelve very beautiful views in Manchester, taken by him for the lanthorn, published by Mr. Mudd, copies of which are now being exhibited at the Mechanics' and the Pendleton Exhibitions. The negatives were taken on collodio-albumen, and the prints by the raspberry syrup process.

Mr. Rogerson also exhibited some prints taken by him during the recent frost, which he had polished very highly, from a formula lately published.

Exhibition.

LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Seventh Annual Exhibition of the Photographic Society was, as intimated in our last, opened to the public on Friday, the 13th ult., the private view having been held on the preceding day, on which occasion there was such a goodly gathering of photographers and their friends, that in the course of the day the visitors perhaps outnumbered the works exhibited, and, in consequence, there was not much possibility of seeing to advantage: there was, however, no lack of something to be heard.

The first thing that strikes one on entering the room is that, in returning to the old quarters occupied by the society for several years in succession (until the last two), we have literally come back and can almost fancy the collection to be the same as we last saw there, so familiar is the aspect presented by the general arrangement of the room. There are, however, on the present occasion but very few striking pictures that stand prominently forward from amongst the general mass; yet it must not be supposed from this assertion that the collection is not a good one — on the contrary, it is precisely because the whole collection is generally highly meritorious that the absence of any markedly striking feature is felt. We must, however, make one exception with regard to this statement; for the place of honour at the west end of the room is occupied by a production that is certainly conspicuous in a pre-eminent degree, we mean (No. 338) a copy of the cartoon, *Paul Preaching at Athens*, photographed by C. Thurston Thompson, and coloured by J. S. Morgan so as to resemble the original before the colour was partially destroyed by age. This picture is upon a very large scale, and as an illustration of what can be effected in this way by the aid of photography, is truly valuable; in fact, it shows us how, by a judicious combination of science and art, we may rescue many invaluable works from nearly total seclusion, and, at the same time, goes far to enable us almost to bid defiance to the destructive hand of time; for just as the printing press preserves the spirit of the manuscript so does this new application of the camera and the pencil preserve the spirit of the painting, in producing copies too numerous and, consequently, too widely diffused to allow of their running much chance of total extinction.

We have often before had occasion to deprecate the abuse of the brush with regard to photography: it is therefore with the greater pleasure that we feel able to recognise its legitimate application. We cannot refrain also from noticing Mr. Thompson's good taste in not attempting to overdo a good thing. This single specimen is more effective than a dozen of the same tribe would be, and where the size is so large, the space required is an important consideration. No one can grudge it for the one fine specimen; but with a room of such moderate dimensions as that occupied, a greater number of the cartoons, even if as well executed as the one under consideration, would have been embarrassing. Mr. Thompson's moderation is therefore satisfactory as well as graceful.

The general arrangement of the works does credit to the hanging committee. There are, however, some very meritorious specimens that occupy but indifferent, not to say bad places. Some of them we shall have to notice hereafter, when we can manage to see them; but on making inquiries of the custodian of the collection, we were informed that the works so placed were not sent in until long after the last day fixed for receiving contributions, and most of them not until after the arrangement of the pictures was completed and the catalogue partly framed. Under these circumstances, though we are sorry that works deserving a better situation should be so placed that they can only be imperfectly seen, we do not think that the producers can justly complain. They have only themselves to blame; for it would be simply *impossible* to re-arrange the whole at the last moment, even if those who have devoted their gratuitous labour and valuable experience to the performance of an onerous and thankless duty were inclined to do it. There is one suggestion which we would offer to the gentlemen of the hanging committee: that to exonerate themselves from want of due discrimination, they should append a *label* to all specimens that have been thus unavoidably badly placed for examination, indicating the unreasonable lateness of time at which they were sent in. It is our opinion that had they been altogether excluded the committee would have been quite justified in such a decision, and their being included at all should be regarded as a concession.

It is with considerable satisfaction we observe that the printing of the several productions is of a high character: this has been more and more noticeable at each succeeding exhibition, and tends to display the growing conviction of the great importance of this part of the manipulation. We also recognise the fact that there are more lady exhibitors than have ever hitherto favoured us, and we think there is not improbably some connection between the two circumstances. Photographic printing is an employment peculiarly adapted for female industry, and when once sufficiently interested in the occupation to undertake it, it is not surprising that some at least of our *photographic sisters* should like to try their skill at producing negatives. It is with much pleasure that we welcome them amongst our effective volunteers. We may here remark, *en passant*, that one of the most beautiful landscape pictures in the exhibition (No. 463) is the handiwork of a lady.

We would recommend for the future the addition of some initials at least to the intimation as given in the present catalogue, which merely indicates—"by *a* lady." The regulations require the *name* of the photographer; and though we are quite willing to admit that ladies should be entirely at liberty to withhold their names if they please, it is rather puzzling when we find works evidently by different hands described in the same manner. This will no doubt suggest itself to the fair exhibitors for the future; the intimation simply "by a lady" being evidence of the novelty of the position—each one of course supposing that it would be a sufficient distinction.

We will now proceed to take a rapid glance at the various works. Time will not permit us to review in detail more than a fraction of those that deserve special notice, the average of excellence being, as we before stated, very high. We shall therefore content ourselves on the present occasion with general rather than particular remarks.

Amongst the veteran contributors we observe the names of Bedford, Fenton, Gutch, Hennah, Lyte, Morgan, Robinson, Rosling, Thompson, Williams, &c., &c. But several old friends are altogether unrepresented. For instance, we miss the thoughtful productions of Rejlander, the charming rural scenes of Turner, the finished studies of Llewellyn, and many others for which we naturally look; but on the other hand we have some new recruits.

Occupying the post of honour at the east end of the room, and exactly facing the cartoon before noticed, we find a mass of Mr. Fenton's charming landscapes, &c., of which we may mention particularly (No. 134) *The Keeper's Rest, Ribbleside*, which displays a wooded nook beside the river, where the guardians of wood and stream are assembled for their mid-day refreshment; it is altogether a refreshing picture. Nos. 131 and 142 are companions, and are both excellent subjects, but not given with Mr. Fenton's usual ability. No. 120, however, is on the contrary a perfect gem: it represents a portion of *The Cloisters, New College, Oxford*, and is very artistic in its treatment. No. 121, *The Lily House, Botanic Garden, Oxford*, deserves especial commendation, and is not only a picture but a valuable botanical illustration. The two last are of smaller dimensions than most of Mr. Fenton's works, but of a size that we very much prefer. We think, also, that they are on this account more likely to attain a much larger circulation than those of very great size.

We notice also that Mr. Fenton has been unusually successful in copying a painting by Lance, as exhibited in No. 116, where the equivalent of colour in light and shade is very happily accomplished. "May his shadow never be less!"—not an inappropriate sentiment towards a landscape photographer, as it presupposes the presence of sunshine.

Mr. Henry White exhibits some very carefully-executed landscapes of large sizes. No. 155, *The Wheat Field*, and No. 115, *Scotch Firs*, struck us as favourite examples, in which pleasing subjects are rendered with plenty of nice half-tone and well posed.

Mr. Bedford charms us as usual with his highly-finished cabinet-picture style. Our especial favourite is (No. 238) *Moel Siabod, at Capel Curig:* the distance especially is exquisitely rendered. (No. 216) *View at Aber*, (217) *Pont-y-Pair*, and (227) *View at Capel Curig*—all in North Wales—are decidedly above the average, that is, Mr. Bedford's average, and consequently super-excellent.

We are pleased to observe that Mr. Bedford has taken two views in Chester, one in Bridge Street, the other in Eastgate Street. Chester is a very picturesque old town, and affords abundance of "food for the camera," but somewhat difficult to get at, owing to the extreme narrowness of the streets.

Conway Castle seems a very favourite subject, if we may judge from the frequency of its occurrence. We have it by Mr. Bedford (in No. 225) from a more picturesque point of view than usual. There are two illustrations of it by S. H. G. (a Liverpool lady, as we are credibly informed), Nos. 63 and 306, both beautifully printed from very fair negatives. We scarcely remember an exhibition of photographs in which *Conway Castle* has not figured. It is something like the *Finding the Body of Harold* amongst the knights of the palette.

Mr. John H. Morgan, of Bristol, whose exquisite productions we have several times noticed on former occasions, contributes many beautiful landscapes, &c., amongst which we prefer No. 90, *View near Chagford*, a lovely combination of wood and water; No. 93, *The Cart Shed*, a capital study; and No. 465, *View at Aber*. This last is taken from a spot not far from that chosen by Mr. Bedford (No. 216); but let those who deride photography as a mechanical art look at the two and own that the impress of the individual is undeniably stamped on each. Both are excellent, yet how different the treatment! The two gentlemen named appear to have been following much the same track during the past season.

Messrs. Ross and Thompson, of Edinburgh, have furnished some of their valuable studies of what we may call roadside plants, as No. 80, *Marsh Coltsfoot*; No. 95, *Hemlock*; No. 305, *Reeds and Water Plantain*. These are botanical illustrations, artists' studies, and pictures, all in one.

Mr. Henry P. Robinson, of Leamington, is the principal contributor of figure subjects. We have already mentioned that he is to be the recipient of the Prize Medal of the Photographic Society of Scotland, for his group designated *Here they come!* (No. 429), a well-posed group of two peasant girls on a moorland, one of them being prone on the heath, the other wearing a sun-bonnet, and shading her eyes with her left hand, while she is looking eagerly for the coming of her expected companions. There are several groups that we have before noticed in these pages at length, as well as many new ones, amongst which No. 504, *Studies*, No. 447, *The Lady of Shalott*, No. 459, *A Cottage Home*, No. 462, *Lavinia*, are deserving of attention.

We mentioned in the earlier part of this notice that there were several lady exhibitors. On the screen next the door there are four which we judge to be by the same hand, though of very different degrees of merit. No. 412 is under-exposed, but No. 413, *Village Carpenters*, is very good in manipulation, though the pose is a little stiff and formal. No. 390, *Interior of a Church in Salop*, affords evidence of future promise in the operator.

Mr. F. M. Lyte displays a goodly number of his continental gems—some fifteen or sixteen we reckoned, perhaps there are more —all good, some perfectly beautiful, as, for instance, No. 448, *St. Jean-pied de Port, Haute Pyrénées*, in which there is a combination of sky, water, and, above all, *atmosphere*, that cannot fail to delight the eye of an artist. No. 436, *Le Chaos de Gavarnie*, No. 96, *Le Pas de l'Echelle*, and No. 172, *Le Pont de Bétharram*, are, perhaps, amongst the extra charming ones.

No. 488, *Near Coniston, Lancashire*, by James Mudd, of Manchester, is an exquisite landscape, in which the distant hills are beautifully softened by the intervening atmosphere; the waters leaping from rock to rock are transparent; and the whole subject is well chosen and as well executed. This is the picture which wins the prize medal at Edinburgh in the landscape competition. We notice that it is by the collodio-albumen process. We have several others of Mr. Mudd's productions to notice, but as they are mostly by a dry process we shall postpone any further mention of them until a future number, as we wish to contrast them with others also by dry processes, and treat of the whole of these together, as they do not hold a place one whit inferior to those from moist plates, when considered *en masse*. Amongst those to comment on we have reserved some very fine pictures by Mr. Rosling, Mrs. Verschoyle, Mr. Sykes Ward, Mr. Melhuish, Mr. S. Bourne, &c. &c. With regard to the last-named, we perceive with much satisfaction that he has made wonderful progress since last year in *artistic* excellence: his manipulation was then of very high character, and, if we remember rightly, he only missed securing the prize given by the Nottingham Society in consequence of the pictures he sent in for competition being somewhat deficient in this quality. Should that circumstance have directed his attention to the failing, the apparent loss will have been a positive gain of no slight value. We have not half exhausted our notes, but the length to which we have already extended this notice warns us for the present to close our observations.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VI. *(Continued.)*

BRINGING OUT THE HEAD.

You have now secured the principal features, but before proceeding examine your picture side by side with a good untouched print upon albumenised paper* to convince yourself that the true form and expression have not been in any degree destroyed. The greatest difference should be found in the increased transparency of the shadows obtained principally by strengthening the "reflections," and a greater force of effect in your "touched" picture.

THE PRINCIPAL LIGHT.

A well-lighted head will have the highest or brightest light upon the top of the forehead, and the faintest upon the chin, and between them the high lights will graduate according to the prominency of the surface upon which they fall. This rule should never be lost sight of. The light upon the forehead is brightest because nearest to the illuminating point; and that on the chin faintest, because farthest from the same. In treating all lights, therefore, proper subordination to that which is the principal becomes of great importance.

REFLECTIONS

Constitute one of the most important elements of roundness.† The following experiments will do more to illustrate this, and impress it clearly and forcibly upon your attention, than all I could write upon the subject.

* Prints upon albumenised paper invariably give more detail and better gradations.

† A point which I have, in a preceding chapter, strongly urged upon the attention of photographers, who have sadly neglected this source of beauty and effect, and thus originated in the minds of clever men, not practical photographers, a belief that the power of our art is so limited as to be unable to secure the proper order of artistic effects. See the article I have before referred to in the *Quarterly Review*.

Take a white globular form and place it in the direct light from any aperture. Where the rays of light fall you will of course find the "highest" or "principal light," and from this point the tone of the surface will deepen in proportion to its receding character until where it becomes darkest; it will again graduate into a shining reflected light.

This reflection will, however, by contrast, appear much stronger than it really is, and to prove this try another experiment.

Lay a roll of writing paper on a piece of white card immediately before a window, and bend up the card on the side farthest from the light until you get the reflection as *strong as possible*, then compare the reflected with the direct light, and you will immediately see how great a difference exists in their relative strength, or power.

Reflected lights will be found near the extreme edge of the shadows on the side farthest from the illuminating point, and in or near the centre of such shadows as are formed on surfaces shielded by their projection from direct light.

With the utmost attention to the preservation of the photograph, then judiciously strengthen the reflected lights by touching tenderly upon the masses of shadow, modelling with the same faint touch until the head begins to assume the roundness of a marble bust.

BLACK AND WHITE AS LIGHT AND SHADE.

Considering the form of the head as very similar to that of a globe, you will at once understand how small a portion of its surface is exposed to direct light; and as this portion of direct light must be represented with white, it will be apparent to you that such photographic portraits as are nearly all white (as but too many are) must be thoroughly false to nature. Take white as representative of your highest light, black as the representative of your deepest shadow, and between the two blend as many tones as will give (nearly as possible) that insensible gradation from light to shade which exists in nature. Many photographers, either by the printing, exposure, or developing, absolutely *endeavour* to produce the flat effect obtained by too great a preponderance of white, and it is only on such pictures that the process of touching becomes a positive necessity; for if they (the operators) will not or cannot get truth in the camera, as they certainly may, they must from the brush.

METHOD OF WORKING — WASHING.

In applying the first strengthening tints, do so with a few *faint* "washes," avoiding either too full or too dry a pencil, calculating the space you have to cover, and taking up just enough colour to do it with, using a small or large brush according to the quantity required. Your "wash," as colour so applied is called, cannot be too pale, although it is bad policy to repeat this process frequently, because it disturbs the surface of the print. A small piece of paper may be placed beside you to test the strength of your tint before applying it to the photograph. Let one tint be lost in another as gradually and imperceptibly as you can. In graduating a wash, either take up water or colour, according to your desire, whether it be to graduate it from pale into dark or the contrary. In graduating with touches, do so by repetition, carefully observing the minutest gradations, and using but little colour.

The first wash should be allowed to dry before the application of a second. If it prove too dark wash it with clean water and absorb the moisture with clean blotting paper.

The author of the preceding paper has, in order, to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

James Williamson (Hammersmith). — Such advertisments only serve to entrap the thoughtless and unwary, and are more serious in their consequences than many imagine. Several poor girls, anxious to secure a genteel and comfortable livelihood, with but very few pounds to spare, have, to my personal knowledge, been induced by these enticing quacks to expend their little all in supporting themselves while receiving the half-dozen or more lessons for which the greater portion of their trifling capital was expended. Photographic colouring is an art by no means easy to acquire; and much time and study must be devoted to it before the student will be in a position to earn a shilling thereby. I know there are those who fancy the colouring of a photograph and the colouring of an engraving demand about the same amount of skill and knowledge; and many hand-books of photographic colouring strengthen the notion by their thoroughly unartistic character, and the studiously unpretending nature of the instructions given. You will easily understand that a little can be taught in less time and with fewer words than are required for the ample details and carefully explained particulars, which alone will insure the honest teacher and the earnest pupils success. I *do* believe that these instructions, and the advice and criticism I have proffered in individual cases will, and I am sure ought, with practice, to make really good photographic colourists.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

ENLARGING.

To the Editor.

Sir,—Please oblige me with a mode of enlarging photographic portraits from small ones by the means I possess, namely, a *whole, half,* and *quarter size* camera, with excellent lenses. I cannot afford Woodward's solar camera, which I have heard so much of, but I feel assured with your vast knowledge of such matters you can help me. My object is to produce a print sharp and vigorous, the *head to be five inches*, and a small portion of the shoulders. My large camera does this *badly: every part magnified.*

My apology for thus troubling you is that I live 400 miles from civilisation, but your Journal gives me many valuable hints

Cork, Jan. 16th, 1860. I am, yours, &c. E. J. H.

[Take your negatives with your *smallest* combination, develop with an iron solution, and do *not* strengthen its intensity, but aim at producing a negative full of detail but *weak*, and such as would not print well upon paper.

To enlarge from this, put it into its original position in the small camera, rack out the lens a little farther, remove the lens of your largest camera, and place the two face to face, drawing out the larger one to its full extent, and if need be lengthening it by attaching some light-tight materials between the lens of the small camera and the opening of the larger one. Fix the two in position on a piece of board, and turn the whole upwards towards the sky, presenting the back of the small camera towards the light; the shutter must be drawn up, and the back lid opened to allow the light to pass through the negative; then focus carefully, and having done, so shut off the light while you replace the focussing-screen of the larger camera with the sensitive plate. Expose and develop, &c. as usual; a transmitted positive will result, from which, if desired, a negative may be taken by printing on a dry plate. There is here, however, a good field open for applying a suggestion of M. Poitevin's noticed in our Leaders of 15th December and 1st January last, which see.—Ed.]

LARGE PORTRAITS.

To the Editor.

Sir,—In the number of your Journal of January 1st, there is a short notice of the Exhibition of the Scottish Photographic Society, now open in Edinburgh. The writer of the notice has slipped into two errors *regarding us*, which, with your permission, we would now correct. The article states: "In this year's Exhibition there are some very large portraits — that is, *enlarged;*" * * * "but in these I find no appearance of progress." What we object to here is the explanatory words, "*that is enlarged.*" We exhibit the largest portraits in this collection, or, for that matter, ever displayed in any exhibition, and *they are* not *enlarged.* Nos. 111, 298, 695, are ordinary prints, each occupying a complete sheet of photographic paper. They are from collodion negatives, and are half-life size, and were taken *directly from life* during the month of November last. But for the fear of trespassing too far on your space we would feel disposed to describe somewhat particularly the lens and camera used, exposure given, &c., in producing these pictures. However, if you think well of it we can do so at a future time.

Anent your correspondent's *opinion* that in this there is "no progress," we say nothing; but if our other engagements and the present scarcity of light permit us to get passable copies printed soon, we will have pleasure in forwarding to you proofs from the same negatives, quite *untouched* as are those in the Exhibition, and you can then form your own opinion.

One other slight mistake has crept into the notice. We are designated as of Dundee instead of Glasgow. Why do those who get up the Exhibition catalogue omit the residence of photographers in the list of artists exhibiting. In nearly every case they do know, and it may be interesting to the public to know also, and is sometimes absolutely necessary to identify the person. Who is T. H. Morgan? or J. Stuart? There is nothing to indicate that one is located in the north of Scotland, or that the other is domiciled in the south of England.

We are, sir, yours respectfully,

CRAMB BROTHERS.

P.S. The exact size of the pictures referred to above is, respectively:— Nos. 111, 298, are on a sheet of "Towgood," 20 × 16 inches. No. 695 is on "Saxe," and is 23 × 18 inches. C. B.

[The notice of the exhibition named is, as you perceive, from a correspondent, who is in general an acute observer.

We shall be happy to state our own opinion upon the merits of the productions, if we have an opportunity; but we do so (if at all) candidly.

The catalogues are not, as a rule, ever properly got up. The best we ever saw was arranged at Dundee.—Ed.]

LENSES.

To the Editor.

Sir,—In these times of inquiry respecting the best photographic lenses, I think that any information respecting them must be of general interest. It appears that Mr. Wilson, of Aberdeen, to the excellence of whose photographs your last number bears a high tribute, has, in communicating with another periodical, vouchsafed an adverse opinion upon a certain lens. This is a practice so unusual that I rather suspect there is something under the surface which does not appear, and the more so as the editor of the periodical is notoriously inimical to the patentee of the lenses in question. I am personally acquainted with several photographers who, in common with myself, have tried these lenses, and with the best results. Should Mr. Wilson have made any similar communication to you, I think your publishing it, together with any information you can give us on the matter, would be generally acceptable. For my own part, I would place much more reliance on what comes from *neutral ground* than from *antagonists' quarters*. X.

[Mr. Wilson has certainly made no such communication to us, nor should we think it at all probable that a professional artist and photographer of his standing would have *volunteered* any such statement. It must be borne in mind that, clever artist as Mr. Wilson undoubtedly is, he may possibly not be possessed also of much optical knowledge, in which case it is very easy to *misapply* lenses constructed for some special purpose: for instance, such as would be well adapted for delineating the exquisite sunset views we lately noticed, might, and most probably would, be unfitted because not intended for taking architectural subjects without some reduction of their aperture. We make no *assertion* respecting Mr. Wilson's optical knowledge—we are merely supposing a case—but will call his attention to this note, in which case he may, perhaps, be inclined to enlighten us. We may, however, here remark, that we have a very high opinion of the *principle* involved in the construction of the lenses to which you refer, if we understand you correctly.—Ed.]

To the Editor.

The Rev. Edward Leachman presents his compliments to the Editor of the British Journal of Photography, and would call his attention to an error in the Almanack Mr. E. L. has received with this month's number, which if uncorrected may prove a source of perplexity and annoyance to those making trial of M. Poitevin's positive printing process.

In the Almanack it is stated that the prepared paper is to be exposed beneath a *negative*, a statement confuted by the concluding observation that the parts *not* acted on by light are subsequently converted into black gallate of iron.

A careful reader would immediately discover the discrepancy; but as it is just possible that *all* your readers are not sufficiently so, it might be a service to such to "make a note of" the mistake.

The process is very correctly given in the number for July 15, 1859, of your Journal, where it is particularly stated that 'the design' to be copied must be *positive*, for the parts of the paper thus prepared influenced by light are white."

8, *Oakley Villas, Adelaide Road, Haverstock Hill, N. W., Jan.* 11.

[Want of space prevented the appearance of this note and some others in our last.

We are obliged to our correspondent for correcting the error named.

We may be permitted to mention, however, that we are *not responsible* for the Almanack, which we did not see either in MS. or in type till it was published.—Ed.]

CHEMICAL FOCUS—RESTORATION OF COLLODION.

To the Editor.

Sir,—You would much oblige by enlightening me in your next upon the means of how to proceed to make the visual with chemical focus to agree together. I have a Derogy's portrait combination lens, and although the image is perfect (very sharp) on focussing on a ground-glass, I cannot obtain the same on collodion plate after having fixed it.

2nd.—What may be done to increase the sensitiveness of old collodion which has been kept for two years? the colour is a pale sherry, but the sensitiveness is diminished. I see Messrs. Squire & Co. are advertising Collodion-Reviver, may I depend upon it so far as to be certain that my old collodion will not be spoiled by adding this mixture?

I am, yours, &c.,

OLD SUBSCRIBER.

[1. In the specimen of Derogy's lenses which we tested the chemical and visual foci agreed perfectly in all its combinations. If it do not you cannot rectify it except by making a proportionate allowance of distance when focussing; but should the foci really *not agree*, the lens should be returned to the maker.

We have several times described how to test this point by the use of M. Claudet's focimeter or any substitute for it.

The image before fixing should be noticed to see whether you do not render it indistinct by dissolving out a part with your cyanide solution.

2. It will not *spoil* it, though you cannot restore it to its pristine condition. It is probable that the collodion has become decomposed from long keeping.—Ed.]

ACTINOMETER.

To the Editor.

Sir,—Dr. Woods, of Parsonstown, has lately brought before the notice of scientific men and photographers an actinometer, which, from its accuracy, will be, I think, a great boon to the latter. The Doctor states that heat will probably interfere with the perfect working of the instrument, and suggests that a thermometer be placed in the liquid to register the temperature.

Would it not be better to have one bottle with the peroxalate of iron solution, and a second bottle containing water only, furnished with a tube the same bore as the other, and place them side by side?

The expansion by heat would at once be ascertained, and deducted from the peroxalate register would give the amount of actinism.

He also states that the heat may possibly cause the solution to throw off more carbonic acid, and thus cause inaccuracy.

I do not find much difficulty in that respect, and should photographers adopt this instrument, they will, I think, find it sufficiently accurate for their purpose. I am, sir, yours, &c.,

DE ALIENO CORIO LIBERALIS.

Manchester, January 24th, 1860.

[Good! If our correspondent will favour us with a sketch and full particulars of his plans, we will try and induce some of our enterprising photographic instrument makers to get up actinometers for sale at reasonable rates.—Ed.]

OUR INSANE CORRESPONDENT.

To the Editor.

Dear Sir,—Do you know anything relative to the enclosed advertisement?

"If the symmetrical trouble-it lens which was 'so much at sea' in the Scotch waters will return to its disconsolate projector, *all faults will be forgiven*, and *no troublesome questions asked*."

I have been thinking that perhaps there may be some connection between it and the *Favourite Fairy* noticed in your number of Dec. 15, as I observed that she admitted being "*something beside herself*."

I am, yours, &c.,

?

ANSWERS TO CORRESPONDENTS.

*** Foreign Correspondence.—Owing, no doubt, to some postal mishap our Paris Correspondent's Letter has not come to hand before going to press.

Cedo Nulli.—We have no objection.

Cursitor.—Take the *third* on your list.

J. R. A.—You will perceive that we have acted upon your hint.

Zany.—You had better make a new toning bath by Mr. Maxwell Lyte's formula.

Pen Owen.—Consult the "Photographic Glossary" in last year's volume.

Omega.—Hollingsworth's thin paper is best suited for printing on by development.

W. G. Smith.—We have already expressed an opinion upon the instrument named by you. See our last volume, pages 223, 236, and 263.

Focus.—It is too much to expect a lens to answer well for everything. You must limit your operations to what it is constructed for.

S. H. H.—See our Paris Correspondent's letter in last number of this Journal for a portable developer.

Anson. It is probable your bath contains too much iodide of silver; add some more nitrate of silver to it and filter.

J. Watson.—You will find your question answered in the present number. See *article* on "Fixing Positive Prints."

Charles T.—Your nitrate of silver is probably impure; it should be in flat crystals. Nitrate of potash crystallises in needle-like crystals.

A Beginner.—Do not be discouraged with the difficulties that beset you; every failure is a step in experience on the road that all Photographers must travel.

Chrome.—We have seen no specimens of photography in natural colours: it would require the employment of a sensitive salt capable of assuming every colour in nature and art, and other conditions, which at present appear impossible to be obtained.

Enquirer.—We are not aware of the name of the maker of the India-rubber gauntlets, but believe they are to be had of a dealer in waterproof materials, located in the Strand, near Temple Bar, London.

M. D., Crown Street, Aberdeen.—Why use such a barbarous word as "*Stereogram?*" Telegram was an unfortunate necessity, because telegraph was already in use otherwise, but there is no need to inflict such a cacophonous termination on stereograph, photograph, lithograph, &c.

Thomas Barnes.—There are several very good portable operating chambers See the account of Smartt's Tent in our last it is sold by Murray and Heath. Burfield and Rouch have a very excellent one; as also Shepherd, of Farringdon Street, and many other makers.

Tite Barnacle.—We have before now expressed our indignation at the attempted exclusion of cameras from public places (being the property of the public) where there can be no pretence for obstruction It is monstrous. We have on several occasions worked in forbidden places without hindrance, simply because it never occurred to us as being necessary to *ask leave*—indeed, had it been suggested to us we should have scouted the idea.

Received.—"Very Dry"—"F. B."—"E. W. B."—"R. Peers"—"W. W."—"Q."—"Lovell Reeve"—and "T. B. W."

We must crave the indulgence of these and many other correspondents. We are suffering from a very severe attack of illness, and are quite incapable of attending to them for the present, but will do so as early as possible. The same applies also to the reports of meetings, &c., as our attack was too sudden to admit of our procuring extra assistance, or of being in a condition to do so subsequently.

☞ Several articles in type have been omitted for want of space, among which are "Sel D Or's" Second Notice of the Exhibition of the Photographic Society of Scotland, and "Notes of a Photographic Tour in the Holy Land." No. XIII.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 112, Vol. VII.—FEBRUARY 15, 1860.

A document of considerable importance to photographers will be found in another column. We allude to the first report of the Committee appointed by the Photographic Society to examine such specimens of collodion as should be voluntarily submitted to it, accompanied by *full details of composition and method of manufacture, without, any reservation*. Before commencing operations an advertisement was published by the Committee announcing its intended proceedings, and inviting manufacturers of collodion to submit their productions to the proposed scrutiny; and it is, we think, much to be regretted that in addition to Mr. Hardwich only two other gentlemen responded to the invitation, and those two failed to supply a sufficient quantity of material to enable every member of the committee to make the necessary comparative experiments. The report now before us is, therefore, confined exclusively to a statement of the results ascertained upon examination of Mr. Hardwich's collodion alone.

The indisposition manifested by the generality of the manufacturers of collodion to respond to the invitation of the Collodion Committee must have arisen from one of the three following causes:—

1st. The non-existence of any definite formula.

2nd. Apprehension lest any formula employed should be found unsound in principle.

3rd. Inability to perceive any advantage likely to accrue from the communication of what may be regarded as a "trade secret."

Of these the last-named is, in all probability, that which has had most influence, and, if so, it is the more to be deplored that any impediment should have interfered with the proper investigation of the other two samples of collodion furnished, together with the necessary information. We cannot help thinking that the Council of the Photographic Society would have willingly afforded the necessary funds to have purchased, if needful, any further quantity, and it could certainly not have been objected to as a misapplication of the Society's funds. Had this course been adopted the Committee would, in all probability, have felt relieved, partially at least, from a little embarrassment under which its members have evidently laboured from having had to deal with only one sample of collodion. This embarrassment is very apparent on carefully perusing the "report," as it may be noticed that the remarks quoted are generally incomplete, and partake rather of a negative character.

It is scarcely to be expected that so numerous a body as that constituting the Collodion Committee would have been unanimous in the majority of the opinions expressed by its several members, and, therefore, in order to include as much unanimity as possible, it would probably be necessary to exclude a very large portion of the remarks of each individual. Now it occurs to us that it might not be at all a bad plan to publish, at an early date, the separate opinions of each member of the Committee *in extenso*, thus following the practice observed in parliamentary committees of giving the *evidence* upon which the reports are founded.

In considering this "report" in its details, we not only find that it affords high testimony to the excellence of the collodion examined, but also draws attention to several points of general interest, not merely with reference to this but to most other kinds of collodion. With regard to the freedom enjoyed by Mr. Hardwich's collodion from liability to putting the nitrate of silver bath out of order, though the Committee, as a body, pronounces no opinion on the cause, certain members attribute it to the exclusive use of pure ether and alcohol instead of *methylated* spirits, as employed by some manufacturers.

This is completely in accordance with an opinion that we have more than once expressed relative to the injurious action that we are convinced is exercised by methylated spirit upon the nitrate of silver bath.

The evidence upon the superior stability of iodide of cadmium as an iodiser is also corroborative of general experience; but, what is of more importance, and that which does not seem to have been so generally recognised, is the fact that a proper admixture of iodides and bromides produces a far more stable collodion, and enables it to render the effect of colour in landscape scenery in truer gradation than when an iodide alone is resorted to. This is a point which was clearly and satisfactorily demonstrated more than twelve months back by Mr. Heisch, and to which we have repeatedly drawn attention in these pages. The numerous questions of importance that have been raised in this investigation, and the nature of the remarks made by several of the members of the Committee, tend to demonstrate clearly the probable advantage that would arise from a series of well-conducted comparative experiments with different kinds of collodion.

We perceive that the name of the editor of a weekly contemporary has been removed from the title-page of the publication hitherto under his management. The fact is significant.

ON THE OPTICAL CENTRE.

By Thomas Grubb, M.R.I.A.

No. II.

If the object at present in hand were confined to that of showing that any optical centre belonging to what I have purposed to designate an "open compound," is not of a fixed nature, but, on the contrary, varies in its position with the circumstances under which the compound is used, a sufficient proof of the same is contained within the limits of two very simple propositions, viz.:—

1st. That the *place* of such a centre must have a relation *to the powers exerted* on either side of that centre.

2nd. That we necessarily alter these powers, *without altering the compound*, by merely making a change in the proportion of the conjugates formed by such compound.

Every photographer or person having within his reach an ordinary portrait combination can, as we shall see by-and-by, test the truth of this practically.

When, however, we are led by circumstances to consider that which had appeared to possess a fixed character to be, on the contrary, *variable*, it becomes not only interesting but profitable to investigate the laws and conditions which affect such changes.

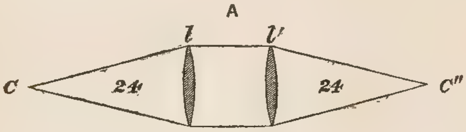
The present case is no exception, and as the examination of the laws which govern these changes afford the best possible proof of the changes themselves, I make no further apology for treating the subject in a general as well as in a popular manner.

Having assumed that no fixed optical centre is to be found in the open compound, I may at once state what is to be found in such, viz., an innumerable number of places (or points) occurring within a certain limited distance in the axis, which points, in the absence

of a better term, I shall call "*centres of conjugate foci.*" This term is perhaps as good as can well be devised, but still (although not wishing to be fastidious about a name) it does not quite please me, as the word "centre" seems to imply, and may serve in some cases to perpetuate, a general and very erroneous impression, viz., that something like a convergence of rays or a meeting of focal points there takes place — something in short which renders the place of this centre (or rather the places of these centres) the best for placing limiting diaphragms, &c. As we proceed it will appear what does take place at such points.

Every possible case of conjugate foci is evidently included within two extremes (inclusive), one extreme being that where the lens or compound is directed to parallel rays, the other that where it is used in forming equal conjugate foci; and secondly, the same range of foci, the lens being reversed in position. Where the compound lens is strictly symmetric there will be, of course, no difference on its reversal. Beginning with the simplest case, viz., that of a symmetric compound, applied to form equal conjugate foci, as in figure or case A, where the lenses *l l'*, and the outer conjugates *C C''* being each equal, any centre belonging to the combination, *so used*, must, of necessity, coincide with the centre of construction.

A



A 24 24 P=12

There is a special point connected with this precise case worthy of observation, viz., the distance between the lenses may be *any quantity or nothing* without affecting the power (or equivalent focus) of the combination; in other words, the power is here always equivalent to that of a single lens of the combined power of the lenses *l l'*, or, assuming these to be each of twenty-four inches focus, then the power of the compound will be —

$$(A)\quad \frac{1}{P} = \left(\frac{1}{24} + \frac{1}{24}\right) = \frac{1}{12} \text{ or 12 inches.}$$

This absence of effect, while separating the lenses more or less, is due to the rays passing parallel through the intermediate space. As a general rule, wherever the rays pass through a compound parallel to the axis of same (whether it be through a lens or a space between two lenses), no effect is produced by making that thickness or space more or less, while, on the other hand, wherever the rays do *not* pass parallel to the axis, whether this be through glass or air, or any other medium, the compound *is* affected by the thickness of the same.

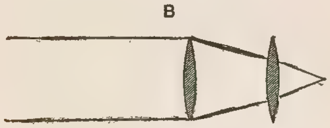
To prove this, suppose the compound represented in fig. 1 be applied to parallel rays, and assume the distance (or d) between the lenses to be twelve inches. The power of the combination will now be —

$$\frac{1}{P} = \frac{1}{f} + \left(\frac{1}{f} \times \frac{f-d}{f}\right)$$

$$(B)\qquad = \frac{1}{24} + \left(\frac{1}{24} \times \frac{12}{24}\right)$$

$$= \frac{1}{16} \text{ or 16 inches the equivalent focus.}$$

B



B 24 24 P=16

We therefore see that the equivalent power of an open combination varies with the conjugates which it is caused to form, being least when applied to parallel rays (the lenses being assumed of the convex kind). We may also find that the "centre of conjugate foci" is, in the case of parallel rays, no longer in the centre of the combination, but removed towards the first lens. In the case before us (*B*) it will have moved two inches. The theoretic proof of this change will be best deferred to another period of our inquiry.

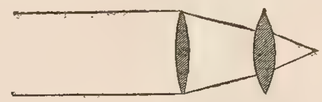
These two first cases being conducted with a symmetric compound, no variation, of course, would occur in reversal of the compound. Let us now examine the changes which take place in the equivalent power of an unsymmetric compound under varying circumstances.

C

C 12 24 P=12

C. The lenses here are assumed to be of twelve and twenty-four inches focus — the distance between remaining as in last case, viz., twelve inches—the shorter lens focus being turned to parallel rays— f and d being in this ease equal, the quantity represented by $\frac{f-d}{f}$ in the formula given at case *B*, is — nothing — therefore the power of the combination is simply that of the first lens, or twelve inches.

D



D 24 12 P=12

D. This is the same combination of case *C*, but reversed in position, and the equivalent focus will be found by the formula of case *B*.

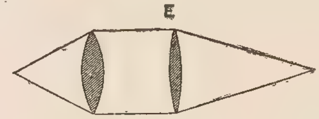
$$\frac{1}{P} = \frac{1}{24} + \left(\frac{1}{12} \times \frac{1}{2}\right)$$

$$= \frac{1}{24} + \frac{1}{24}$$

$$= \frac{1}{12}$$

The power of the combination is therefore the same as in the previous position, it is therefore not affected by reversal *when applied to parallel rays.*

E



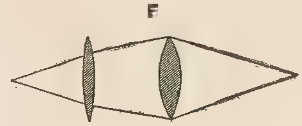
E 12 24 P=8

E. Here the same combination is applied to form *unequal* conjugate foci, the lens of shorter focus being placed at its own focus from the object. In this case the rays evidently pass parallel between the lenses, and therefore (as in case *A*) the equivalent power of the combination is unaffected by the distance of the lenses, — the power being simply the sum of the power of the two lenses, or

$$\frac{1}{P} = \frac{1}{12} + \frac{1}{24}$$

$$\frac{1}{8} \quad \text{or 8 inches,}$$

F



F 24 12 P=10·5

F. The combination of the previous case *reversed:* the lens of longer focus being now turned to the object, and placed at twelve inches from same.

We have now come to a case where in no portion of the distance do the rays pass in parallel lines, and where the calculations consequently lose their previous simplicity. For the present it will be sufficient to state simply the result, viz., that the equivalent power proves to be 10·5 inches, or nearly one-third longer in focus than in the previous position of the compound.

It is to be understood that the usual practice in conducting general investigations such as the present, viz., of neglecting the thickness of the lenses, is followed. It may also be observed that the focal lengths assumed for the lenses in the diagrams do not correspond with those in ordinary practice: neither of these, however, affect, except in quantity, the general results. Assisted by a reference to these diagrams, I expect to be able in my next communication to give a clear exposition of the nature of the centres of conjugate foci in open compounds: meantime, a comparison of the several diagrams may serve to show that with every variation of distance, &c., we so alter the conditions of such compounds that a thorough knowledge of the theory of these, combined with the most scrupulous care, is required in all cases (excepting that of comparative trials of compounds of equal calibre and similar construction) to ensure that the conclusions arrived at are anything better than worthless.

HINTS CONNECTED WITH THE DRY PROCESSES.

By George Shadbolt.

[Read before the Birmingham Photographic Society, January 31st, 1860.]

In compliance with a request made by the Council of your Society, "that I would contribute some paper on a subject connected with photography," to be read this evening at your meeting, I have decided on offering some remarks upon sundry manipulations connected with the various dry processes upon glass, partly because one of your most distinguished members, Dr. Hill Norris, was amongst the pioneers in ascertaining some of the principles upon which the successful working of them depends, and partly in the hope that I may induce a discussion upon the subject, being convinced that as a rule some of the most valuable suggestions have arisen in consequence of such a course of proceeding.

If I remember rightly, one of the earliest, if not the first, intimation given of the successful application of dry collodion was in a communication from Dr. Norris, published in the *Journal of the Photographic Society*, to the effect that he found a collodionised sensitised plate, when simply washed and dried, capable of receiving a developable impression in the camera. This did not excite much notice at the time, and it was not until twelve months or more afterwards that it appeared to be in any way recognised. The reason of such neglect I take to be in consequence of the general want of knowledge of *principles* so prevalent amongst the mass of photographers, and hence it appears to me of the utmost importance in detailing any formula to insist especially upon the principles involved in the operation. The conviction of the fact, that by far the majority of skilful operators content themselves with merely following out to the *letter* the instructions laid down for any particular process (just as they would follow the recipe in a cookery book for making a pudding), often to the total disregard of the spirit, was prominently brought under my notice upon an occasion when I wished to develop an impression which I had taken in very cold weather, upon a plate prepared by Dr. Norris's formula at the factory in Birmingham. The operation was performed at the house of a photographic friend, and in his presence, he being an able manipulator, and I was struck by his not only expressing surprise at my course of proceeding, but subsequently, on the arrival of another good photographer, mentioning to him what I had done as something quite new to them both. I have already stated that the weather was *cold*, and I may add that the plate had been exposed during the failing light of the afternoon of a winter's day: I consequently followed up with my dry plate the manipulation which experience had taught me, when working with moist collodion under similar circumstances, was most likely to give me the greatest amount of detail in the shadows, viz., to commence developing with a solution of a salt of iron, and subsequently to intensify the image thus revealed, by means of pyrogallic acid. I accordingly proceeded to moisten the surface of the plate, in the first place, by immersing it in a dish of distilled water for an instant; I then poured over the plate a small quantity of solution of nitrate of silver (about two grains to each ounce of fluid), and after draining away the superfluous liquid, I covered the plate with a solution of proto-sulphate of iron and acetic acid. As soon as the image appeared the plate was washed, the iodide of silver dissolved out with cyanide of potassium in solution, again washed, and then intensified by means of the ordinary one grain pyrogallic acid developing solution acidified with acetic acid, to which of course a few drops of nitrate of silver had been added. The plate was finally well washed and dried.

Now the part that excited my friend's surprise was, the use of a weak solution of nitrate of silver previously to applying the iron developer—for, strange to say, although they had been in the habit of developing dry plates with gallic acid, to which some silver solution had been added, it never occurred to them, that without the previous use of the silver there was nothing on the plate with which to form the image, and if it were added to the iron solution it became reduced immediately in the form of a fine powder before it could be got on to the plate. This explained to them why they had not been able to succeed in developing a dry plate with an iron solution, and it was consequently plain that they did not comprehend the particular part performed by the nitrate of silver in the formula with the gallic acid.

I may here remark, that I have subsequently employed with advantage for developing similar plates the following method, viz.:— Immerse the plate for a moment in *distilled* water, then cover it with a sufficiency of developing solution made thus:—Place in a Wedgwood mortar fifteen grains of proto-sulphate of iron and one grain of citric acid; reduce to a fine powder, and dissolve in one ounce of *distilled* water. *Just before using*, add two, or three drops of a solution of nitrate of silver (not from the sensitising bath), and this will remain for about the space of a minute without becoming discoloured, quite long enough to cover the plate and bring out the impression. Wash, clear, again wash, and then intensify with pyrogallic or gallic acid solution and a little nitrate of silver. I am not sure whether the gallic acid is not the better of the two, as with it there is no need to add any free vegetable acid, as is requisite with the pyrogallic acid. Of course, the plate must be finally well washed.

I have tried the above method with collodio-albumen plates under various modifications, but hitherto with only partial success: that is to say, I always got an image very full of detail, but it has been invariably contaminated somewhat in the deepest shadows, as if the plate were very much over-exposed. I am therefore hopeful that, by further experiments, we may in this direction find the solution of the problem of readily producing on dry plates an image with a minimum of exposure.

I have heard it asserted, but with what foundation I know not, that if plates prepared by Dr. Norris's formula (which must be too well known to your members to need recapitulation) be exposed and not developed within some moderate space of time afterwards (possibly some days or even weeks), that the impression gradually fades out, and becomes incapable of development. This is a point upon which I trust that Dr. Norris may be induced to give his experience. There is one curious fact which bears upon it that I think worth naming here. Having at the early part of last year to take a journey to Scotland at a very short notice, and not having time to prepare any dry plates for myself, I procured a dozen from the Dry Collodion Plate Company in your town to take with me, as I could not rest contented to go to the northern section of our island without my camera, although the period of the year—mid-winter—was one very unfavourable to the photographer's operations. You are all probably familiar with the manner in which these plates are packed for carriage, with a small piece of cartridge paper folded into plaits so as to separate by a slight interval each plate from its neighbour. Now the curious point to which I allude is that where the paper came in contact with the sensitised film—although no visible difference could be perceived in that part—on developing the exposed plate, *no impression whatever appeared to have been made*. This was observable not only in a single instance, but in every one of the dozen plates which I took with me; and I have noticed the same thing in negatives taken by other photographers upon these plates. Why had the contact of a piece of fair paper removed all sensitiveness?

At the last meeting of the Photographic Society (London), a very interesting paper by Mr. Hardwich was read, and which may be found at length in the last number of The British Journal of Photography, upon the nature of the collodion adapted for the dry processes, in which he shows that collodion which has undergone partial decomposition acts in a similar manner with reference to nitrate of silver, as an *organic* substance. In this view I am inclined to think he is correct; for I well remember, that in corresponding with Dr. Norris, when he was perfecting the details of his process he mentioned the preference he gave to collodion that had become *rotten* from having been long kept, though he attributed the advantage to another cause, viz., its more ready permeability to the gelatine solution which he employed. In spite of the many failures which occurred to me in testing Dr. Norris's process at the time, I was never for a moment shaken in my belief of its excellence, because I looked at the *principle* involved, and was convinced of its general correctness. I imagined that my failures arose from some error in manipulation when removing the

free nitrate of silver before covering the plates with the gelatine solution; and wishing upon a certain occasion to prepare plates for picture-taking (not for experiment), I adopted the method of covering my plates with honey syrup after their removal from the nitrate bath, and previously to washing them. This I did principally with the view of ascertaining to my own satisfaction when my plates were sufficiently freed from the superfluous nitrate of silver, which I judged to be the case, when, after washing and draining the plate, on letting the last drop of liquid fall on the tongue, I could detect no taste either that was metallic or sweet. When this was the case I then immediately applied the coating of gelatine, which I used quite hot. Plates thus prepared developed evenly and without any stains. I found, however, that the character of the collodion made a very material difference in the facility of manipulation, so far as development was concerned; for if it were of the contractile kind, unless the image was perfectly brought out in a short space of time, the film rose under the action of the free acid in the developer in numerous minute papillæ, as it were.

By the use of the honey as above described it is also evident that I was employing the aid of the compound of silver with organic matter; and though this quite accords with the principle involved in Taupenot's process, as also in those of Barnes, Fothergill, and others, yet it is contrary to the theory propounded by Dr. Norris, who, unless I am mistaken, advocates the total removal of the soluble salt of silver prior to the addition of the organic preservative agent.

When discussing this point at a meeting of the North London Photographic Association, some time ago, between those capable of entering into the theory of the question, it was the all but unanimous opinion that the presence of some other compound of silver *besides the iodide* appeared necessary to the reception of an actinic impression; and this opinion is supported by the interesting fact noticed by Mr. Young, of Manchester, relative to the possibility of developing an impression *after* dissolving out the iodide of silver, provided that albumen or some other organic body were present, but not otherwise. It is probable that, as shown by Mr. Hardwich, the decomposed pyroxyline acting as a substitute for an organic substance, the apparent discrepancy may be reconciled. It is a point well worthy of being further experimentally examined.

There is another direction, slightly diverging from that last considered, in which there is a very promising field open for investigation. If we coat a glass plate with a very thin film of albumen, say white of egg one part, water seven parts, and dry rapidly by heat, coat with iodised collodion, sensitise, wash, dry, expose, develop, fix, and wash, we obtain an image which remains on the *albumen* even after removing the collodion film. Now such a process appears to me to entail a minimum of labour in preparing the plates, and avoids blistering, that bugbear of the dry processes. I have verified satisfactorily the feasibility of this plan, but there are many points of practice yet to be worked out. The horny kind of collodion when dried is very impenetrable to the ordinary developing solution; it is therefore highly probable that the powdery kind might replace it with advantage. Again, the admixture of alcohol to some considerable extent with the developing solution might materially assist in enabling it to penetrate the film, and it would also have the advantage of rendering the collodion film very easily removable as soon as the development shall have been completed. If the impression be obtained with plenty of detail I imagine that it is of little consequence about its being faint, as the intensification would, on albumen, be a matter of very little trouble and no difficulty after removing the collodion.

I think it more than probable that with a very short exposure, and by employing the ferric developer previously mentioned, some considerable advantages might be attained; but it must be remembered that I only give the *principles* to be acted upon, not having had the time to work out the details for ascertaining the easiest *modus operandi*, and it is rather in hopes that I may enlist some fellow workers in this direction that I am now induced to allude to the subject.

With regard to the relative capabilities of wet and dry collodion, I am entirely of opinion that the latter is quite equal to the former in its quality of rendering every gradation or half-tone. In one point alone does the former excel, that is in its rapidity of receiving an impression; but I see no reason why that inferiority in this respect with dry collodion should not, by perseverance, be overcome. I noticed that Mr. Hardwich mentioned a fact, to which Mr. Hughes assented, and which my own experience strongly confirms, viz., that the presence of bromide of silver in the dry film is a very important adjunct.

In the preceding desultory remarks my object has been, not so much to communicate any special novelty, as to apply a stimulus to the store of energy possessed by so many of my photographic brethren who are so fortunate as to have much more time than myself for useful experiment directed towards a certain point, and to indicate a field of operation in which I am convinced that laurels are to be won.

REPORT OF THE COLLODION COMMITTEE.

In March, 1859, the Photographic Society appointed a committee to examine samples of photographic collodion, and report upon them, with a view of arriving at a definite formula. Advertisements were issued, which were replied to by Messrs. Hardwich, Mayall, and Sutton; but the two latter of these gentlemen did not send in collodion in sufficient quantity to admit of its being thoroughly tested. Hence, although individual members have worked with the collodions of Mr. Mayall and Mr. Sutton, the committee in its collective capacity can only pronounce upon that prepared for them by Mr. Hardwich. They trust, however, that the investigation which they have undertaken will not be suffered to end with one report, but that other makers of collodion will come forward and assist the society in the determination of this difficult but important question.

In proposing to themselves a scheme for the general conduct of their operations, your committee did not think it advisable to place too much reliance upon experiments made in concert, since these must necessarily have been few and imperfect. It appeared to them better to allow the members to work separately, and afterwards to collect and compare their individual reports. Nearly a year has now elapsed since the committee was formed, and it cannot therefore be objected that its conclusions have been hastily drawn; neither can it be said that the report has been made without a full and impartial examination, for the names of no less than twelve members are appended, who are known to the society to practise every branch of the art. Portraiture, both in the studio and in the open air, landscape scenery, architecture, copying, and sculpture, have all been represented in this investigation, and the lenses employed, and plates covered, have been of every conceivable size. Further, as the various members of the committee differ in their views of the best modes of iodising photographic collodion, opportunity has been afforded of comparing the results obtained by each method, and of drawing conclusions therefrom.

This report, professing to deal with the practical working of negative collodion, may be naturally divided into two parts, for the experience of members of the committee using simple iodides does not admit of comparison with that of others employing in preference iodide and bromide conjoined. There is, however, one ground common to both, viz., the *mechanical properties* of the collodion under examination, and of these we proceed to speak.

The committee are unanimous in thinking that the collodion which Mr. Hardwich has sent in to them is comparatively if not entirely free from glutinosity, crapy lines, contractility, and other defects of the film, which were very commonly met with some years back, when the manufacture of collodion was first commenced. The reports of Messrs. Delamotte and Fenton are the most valuable on this head, since they have worked on glasses of a large size, viz., twenty-four inches by eighteen, and eighteen by fifteen. Their experience is, that although the collodion sometimes contains too much soluble cotton for these large plates, and occasionally requires thinning down with ether and alcohol in very hot weather, yet that the pyroxyline is nearly of the right kind as regards flowing properties, and may with justice be said to be well calculated to support a smooth and even layer of iodide, without any woolliness or ridges.

Another matter which falls under this same head of mechanical properties is the tenacity of the film, and its adhesion to the glass. We are satisfied that the collodion submitted to us is sufficiently tough to bear a reasonable application of water, either from a tap or a jug, without tearing, and that with ordinary care in manipulating it will not fall away from the glass. No member of the committee, as far as can be gathered from their separate reports, has been compelled to grind the surface of the glass at the edge to prevent splitting, or curling off on drying. Mr. Fenton, indeed, states that on using some of the earlier samples of collodion supplied to him by Mr. Hardwich, he was obliged to roughen his largest plates, but that with the collodion which he received during the past summer and autumn he did not find it necessary to take this precaution.

The report being satisfactory on the points above mentioned, we next consider the quality of the film yielded by the collodion, as regards closeness or openness of texture, and here it is found that some members speak of it as being too horny. That the film does possess such a structure is certain, and hence the question of how far this must be considered a defect. The following are extracts from the reports of those members who make complaint. Mr. Bedford says—"One fault I have found is a too quick drying of the film in hot weather. If, as is frequently the case, the plate has to be kept over fifteen minutes or so, it is necessary to add alcohol to the developer to prevent stains and patches of unequal development." Mr. Hughes also observes—"My dark room being small, and w t a southern exposure, becomes almost like an oven in hot

weather, and one of the principal difficulties which I encountered was the partial drying of the film whilst it was in the camera slide." The attention of the other members of the committee was particularly directed towards this horny quality of the film, but, with the exception of Mr. Morgan, who speaks of it as inconvenient but not insuperable, they make no allusion to it in their replies.

Passing next to the consideration of the photographic properties of the collodion, we find it necessary, as before said, to distinguish between the results obtained by simple iodides and those from iodide and bromide in mixture. To begin with the former, there are embodied in this report the observations of nine or ten members who have worked either with iodide of potassium as an iodiser, or with iodide of cadmium. The following is an epitome of their conclusions:—

First, with regard to the sensitiveness of the collodion, the opinion of the majority is, that it is unsurpassed. Mr. Delamotte, who has worked in the subdued light of the Crystal Palace, at Sydenham, with lenses of very considerable focal length, speaks confidently on this point; and Messrs. Bedford, Hughes, Robinson, Sedgfield, and Williams, are of the same opinion. Mr. Frith also, in a letter dated Cairo, August 1st, 1859, says—"I find this collodion exceedingly rapid. Three days after iodising (potassium iodising solution), it will take a picture with the smallest aperture of the landscape lens (fifteen-inch focus) in five seconds; and I have some hope of getting an interesting series of instantaneous pictures, by using a stop of 1½ inch diameter on the portrait lens (3¼ inch diameter). The lens then covers a 4¼ inch plate, with tolerable depth of focus, and I can obtain a sufficiently-developed picture with an absolutely instantaneous exposure, sailing boats with the ropes sharp, moving figures, &c." Under date of the 7th of August, he adds—"We have just returned after having spent five days in the mud-house of an artist at the Pyramids, where we were devoured by thousands of sand-flies; the water very bad, and the heat great. I worked hard, and took some fine pictures. Nothing can be more satisfactory than the performance of the collodion. I still get landscapes with the smallest aperture of the view-lens in four seconds, and have taken capital pictures in the heat of the day. I should imagine the temperature in my little tent could not be less than 130° F. The developing solution was quite hot.*

Mr. J. Morgan, of Bristol, in the report which he has forwarded, does not coincide with the above statement, for he says—"I am able to obtain a similar negative with another collodion in one-half of the time." This discrepancy is the more remarkable because the nitrate bath in each case was made out of pure nitrate of silver crystallised purposely for the committee. The developer, however, which Mr. Morgan employs contains less than the usual proportion of pyrogallic acid, and he sometimes, but not invariably, adds a small portion of citric acid.

When iodide of potassium is employed as the iodiser, the collodion loses its sensitiveness very considerably after a time, but the members of the committee are not agreed as to how long it will keep in good working condition. Mr. Bedford says—"I prefer using it newly iodised, say in about two days: after five or six days it loses sensitiveness, and deteriorates rapidly; but in this state it works well enough when time of exposure is no object. I kept it in even working order by adding some freshly iodised collodion to the stock-bottle daily." Mr. Delamotte writes—"I found, whilst working in the Crystal Palace, that it lost a good deal of its sensitiveness in three or four days, and in offering a suggestion for the improvement of this collodion, I would say that, if possible, it be made to retain its sensitiveness longer, with the same qualities it now possesses in other respects." Mr. Morgan says, in reference to its keeping qualities—"A day or two after iodising is the best time. I have taken a landscape picture with it after a month, but I do not think it improves by keeping as long as that." Mr. Robinson reports—"It gives good results for portraits if used immediately after iodising, but I prefer it when it has been kept two or three days, or for landscapes two or three weeks." Mr. Sedgfield, giving his experience in stereoscopic photography, writes—"I cannot say much as to its keeping qualities, as I seldom have any by me more than a week old." Lastly, we have the report of Mr. T. R. Williams, who, working in a London studio, necessarily requires the maximum of sensitiveness. He considers that the collodion does not alter much during three or four days, but that afterwards it becomes useless for the purpose which he requires.—The foregoing observations apply to the summer season of the year, and not to the colder months, during which the deterioration in sensitiveness is less rapid. Mr. Williams has lately obtained good pictures after a fortnight's keeping.

We next examine the collodion with regard to the quality of the negative which it yields, and in this respect we are able to pronounce upon it favourably. The image is very sharply defined, and the development can be pushed to an extent sufficient to bring out the deepest shadows without adding too much to the opacity of the high lights. The printing qualities of the negative are good, and those parts of the film which are protected from light remain free from fogging. The liability to staining and marks of all kinds in hot weather is not great, as attested by Messrs. Delamotte, Morgan, and others, who state that the collodion gives a clean and bright picture.

In drawing up a report in which gradation of tone in a photograph is spoken of, it must always be borne in mind that the character of the light and the aperture of the lens have much to do with the hardness or softness of the picture; and this observation we find corroborated in the separate reports sent in to us, for, whilst one or two members have found at times a difficulty in obtaining sufficient contrast, others have complained of excess of intensity, although both were working with the same description of bath. Mr. Bedford alludes to this, and says: "In a strong light, or glare of sunshine, there is, I think, a tendency to too great density, a too rapid starting out of the image. This I have remedied by employing a weaker developer, and, in some cases, by washing the free nitrate away from the plate before putting it on, or washing the plate once or twice during the development, using, in that case, silver to give force to the image. By this means I avoided hardness, and secured a good picture under trying circumstances of light and heat." Allowing for these differences in intensity, which must occur with any collodion, we find that the preparation which we have examined is sufficiently good, and that it is not a collodion of that kind which requires a considerable addition of nitrate of silver to the developer, or fails to yield an intense picture unless acetate be added to the bath. As a rule, the image will attain its maximum density shortly after the pyrogallic acid is applied, and there will be a fair share of the characteristic drab or cream colour upon its surface.

Whilst speaking of gradation of tone, it may also be remarked that different developers have been employed by the committee to assist in securing the correct amount of contrast under varying conditions of light and temperature. Thus Mr. Delamotte, working in the Crystal Palace, at rather a low temperature, has developed plates of the stereoscopic size by preference with sulphate of iron; and Messrs. Robinson and T. R. Williams have occasionally used the same reducing agent for portraits. The intensity of the negative taken with sulphate of iron is often sufficient; but, if not so, the development is completed with pyrogallic acid and nitrate of silver.

One question put to the individual members of the committee was the following:—"Have you found the collodion to injure the bath by long use?" The reply is in the negative, and this we consider of importance, because we have on other occasions worked with collodions which had a decided effect in throwing the bath out of order. The committee, as a body, pronounces no opinion on the cause of this; but certain individual members attribute it to the employment of methylated spirits, in place of the pure ether and alcohol which are used by Mr. Hardwich.

The seventh question in the suggestions on the order to be observed in drawing up the reports was as follows:—"What do you consider the principal defects in the collodion?" Mr. Hughes complains of transparent spots with tails, taking the direction of the draining, and showing most distinctly when the collodion was newly iodised; by using bromo-iodide, instead of simple iodide, and developing with sulphate of iron, the spots almost invariably disappeared. Two or three of the members speak of narrow black lines like threads in the direction of the dip; these same lines being sometimes, but not invariably, remedied by rocking the plate laterally immediately after putting it into the bath.

Under the head of Question 9, viz., "State anything which has occurred to you in the course of your experiments likely to forward this investigation," we have the following suggestions from Mr. Russell Sedgfield:—"A collodion iodised with *cadmium* only is very useful in extreme cases, such as dark glens, &c., and I always carry a little with me on my excursions. At present my decision is in favour of a pure potassium iodiser, with some cadmium collodion carried separately for use on occasion, either by itself or, perhaps preferably, mixed. The mixture of the two seems the best for the majority of amateurs, who cannot be expected to go into detail in these matters, and whose consumption is small and irregular. When iodised it certainly keeps much better than it would with potassium alone, and I have just been taking, to satisfy myself, some excellent portraits and views with remnants from my last journey, iodised three months ago." This plan of mixing together collodions possessing opposite properties has been successfully adopted by several members of the committee, when they have satisfied themselves as to the working qualities of each collodion by using them apart.

Mr. T. R. Williams was supplied with cadmium collodion from the committee, in addition to the same plain collodion iodised with potassium; he remarks upon it as follows:—"I have found the cadmium collodion to give the softer image of the two; but they are both good, and some of my best portraits have been taken with them. By using sometimes pyrogallic acid, and sometimes sulphate of iron, and occasionally both on the same plate, it is possible to obtain either a soft, delicate effect, or a bold and hard picture. The cadmium collodion does not appear to deteriorate by keeping in the iodised state."

Included under this same head of "Suggestions for Improvement," &c., we give the following, also from the pen of Mr. Sedgfield:—"Lately when taking interiors I have adopted a suggestion of Mr. Sutton's, by adding strong alcohol and soluble cotton, with a little more iodide, to the samples of collodion which I have by me, in order to get a pappy film capable of retaining its moisture longer than the ethereal and skinny mixtures. My experience of this kind of work has been so far satisfactory, that next season I shall carry the plan out more regularly, although I cannot say whether such a collodion is equally suited for use on all occasions."

Having now concluded the first division of our report, viz., that which refers to the collodion prepared with simple iodides, we pass on to the

* It is only fair to state that the above favourable opinion from Mr. Frith was extracted from private letters written without any idea that they would be included in this report.

second, in which is given the experience of those members of the committee who have worked with iodide and bromide combined.

Mr. Fenton has used collodion sent to him from the committee, in the regular course of his photographic practice during the past year, and has been at some pains to ascertain in what manner it ought to be iodised in order to secure the best results. His lenses have been almost entirely single ones, and of every variety of focus; the character of work, landscape and architecture, with occasionally interiors, and copies of drawings and sculpture. His experience is as follows:—"The collodion prepared with iodide of potassium only ought not to be entirely rejected; it is useful on occasion, being sufficiently sensitive, and producing, for some purposes, a good quality of picture. It has, however, formidable drawbacks, such as soon becoming red and insensitive, and being liable to show white spots, often when used alone, but still more frequently when added to any other collodion." On the whole he gives preference to a mixture of iodide and bromide, which not only produces a far more stable collodion, but represents the colours of landscape scenery in a truer gradation, and brings out the sky and the foreground of the picture at the same time, without solarising.

With reference to the salts which should be employed, Mr. Fenton has worked with a collodion prepared by Mr. Mayall, containing iodide and bromide of magnesium, and also with one made by Mr. Hardwich with the same compounds. The two collodions, however, did not agree in properties, for whereas the former was rather glutinous, and gave a fair share of intensity, the latter was limpid, and produced a weak negative. By mixing them together a good working collodion was obtained, with which some of the views of Oxford now in the Exhibition were taken. He is not inclined, however, to recommend the use of the iodide and bromide of magnesium.

During the months of August and September Mr. Fenton worked with plain collodion similar to that sent to the other members of the Committee, but iodised with iodide and bromide of ammonium and cadmium dissolved in the usual proportion of alcohol. It is extremely sensitive, and takes the dark parts of the picture well, but should be kept for some days after iodising, or there will be occasional white spots and lines on the image. This collodion improves by keeping even for many weeks, and is so far good, but it is difficult to use it for landscape work in hot weather, because the least over-exposure destroys the intensity, and makes the picture flat and thin. A solution of sulphate of iron was used to develop, with mixed pyrogallic acid and nitrate of silver as an intensifier.

Mr. Hughes is an advocate for the employment of iodide and bromide conjointly in portrait collodion, and the reasons which he alleges are these:—"Although with simple iodide a picture of superlative excellence may be taken by a skilful operator, yet to the amateur who desires only a good average result, with little liability to failures, bromide is an assistance. I would direct the attention of the committee to this point."

Mr. J. Spencer communicates an account of some experiments which he has made during the preceding season with bromo-iodised collodion sent to him from the committee. It appeared to him to be very valuable for some kinds of landscape work, and at the season of the year when the light is strong. In the winter, however, he works by preference with a simply iodised collodion, containing only iodide of cadmium. As regards the proper developer to employ with bromo-iodised collodion, he commenced his experiments with sulphate of iron, but as the heat became greater he found pyrogallic acid to be sufficient.

In order to render the above observations complete, we require exact experiments on the comparative sensitiveness of the simply iodised and bromo-iodised collodion. These have not at present been made, and so far the report is incomplete. Without doubt, however, the latter retains its properties very much longer after iodising, and has the merit of producing delicate half tones, whilst a sufficient intensity can in most instances be obtained by carrying on the developing action with pyrogallic acid and nitrate of silver.

Mr. Thurston Thompson, a member of the committee, works exclusively with the bromo-iodide. All the pictures which he has exhibited were taken with a collodion of his own manufacture, and he was unable during the last season to give such careful attention to the collodion sent to him as would justify him in speaking confidently of its merits.

The names of other gentlemen, members of the committee, viz. Mr. Llewelyn, Mr. Maskelyne, Mr. Mayall, Count de Montizon, Mr. Spiller, and Mr. White, will not appear in this report for the same reason.

Mr. Malone, on whom devolved the task of examining the formulæ as regards their chemical aspect, has expressed his full satisfaction with that by which the collodion sent to the committee by Mr. Hardwich was prepared. He has assisted at the manufacture of the pyroxyline and collodion, not in small quantities but on a commercial scale, and has received a complete list of details and precautions which are necessary in order to ensure success.

In concluding this report the committee have much pleasure in expressing their opinion of the superior excellence of the collodion submitted to them by Mr. Hardwich, and they can confidently recommend the society to stamp the same with the full mark of its approbation.

F. Bedford,	J. H. Morgan,	P. Delamotte,
H. P. Robinson,	Hugh W. Diamond,	Alfred Rosling,
Roger Fenton,	W. Russell Sedgfield,	C. J. Hughes,
J. Spencer,	T. A. Malone,	T. R. Williams.

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

The Gibbous Moon.—Samuel Fry, *Brighton*.—It has been observed that the first ocular demonstration of the globular form of our satellite was presented to us by means of the stereoscope. In our last volume we noticed the publication by Mr. Fry of a stereoscopic illustration of the Full Moon: he has more recently produced one in the phase known as gibbous. The negatives from which the two pictures are printed were taken at an interval of eleven months apart, and the variation in points of view is equivalent to an angle of 6¼°. The left hand picture was taken at the Hove Observatory (belonging to Mr. Howell), at the latter part of November, 1858, and the right hand one not till the middle of October of last year. The moon's age, as represented in the stereograph before us, is about sixty hours after the full, and owing to the obliquity of illumination many very beautiful volcanic craters and cones on the gibbous edge are rendered visible, the shadows produced by the irregularities of the surface tending materially to enhance the brilliancy of the effect.

Owing to the satellite being in Apogee when one of the negatives was obtained, and in Perigee when the other was taken, the respective sizes of the corresponding pair were materially different, just as would happen in fact if an operator were to take a portrait of a sitter for one picture when located at the extremity of his glass room, and the other when he had moved a third of the distance nearer to the lens: it will therefore be readily understood that it is requisite to resort to some ingenuity in order to print from them so as to make them combine harmoniously together. We have no doubt that the present one will be even more popular than the former publication.

We understand that Mr. Fry is still indefatigably pursuing his astro-photographic labours, and that we may hope ere long to be introduced to some other magnates of the stellar circle.

Dr. Paterson's Dry Collodion Process.—In our notice of the proceedings of the Photographic Society of Scotland the doctor's *preservative* agent was unfortunately omitted by our reporter. It consists of a solution of gum arabic in water, the strength being such as merely to allow of its being passed through filtering paper. [Query—Was not this "process" patented by Dr. Hill Norris some few years ago?] It is only fair to Dr. Paterson to say that he made no claim to novelty in his communication, although in the official notice sent to the members of the society it was characterised as a "new" process.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. XIII.

The next morning the sun broke in the east with all the signs of a storm; the sun came up upon the hills of Lebanon with a red glow, and the clouds that lay in the east were of the same tint; so that John, when he came out of the tent, quoted the words of the Saviour, and said, "We shall now know if the weather signs are the same in Holy Land as they were two thousand years ago, for the morning is *red and lowering*."

We were in the saddle early, and rode off before the men had struck the tents. Following down the sea shore we soon came to a small village, known as Sarfend, which is the ancient Sarepta, or Zarephath. You recollect it—what child is there in Christian lands that does not recollect it?—as the place of that wonderful barrel of meal and cruse of oil which the prophet gave to the widow woman, whom he found at the gate gathering sticks. There is an exquisite beauty in that story of the woman and her child, which impressed me in boyhood perhaps more than any other of all those Bible stories in which children so much delight. Hence the peculiar pleasure with which I rode over the hill, and looking at the modern village, recalled the scene when the prophet asked of her water to drink, and she went and fetched it.

We did not pause here longer than was necessary to enable me to take a view. Other places of interest were before us, and we wished to have all the afternoon at Cana, if, perchance, we could find any place that would fully satisfy our notions of the locality of that city of the first miracle. We accordingly put our horses to their best speed where the road would allow it, and hastened to the southward by the same road we had gone the previous day with our friends. Long before noon a driving storm commenced, and we repented our fondness for society that had gotten us into

this dull ride, retracing our steps in the face of a tempest. You will observe that our trip to Beyrout rendered necessary a return all the way to Acre, or nearly there, before we should be able to turn off to the eastward towards Nazareth and Cana.

But we pressed on; and, in spite of the rain and wind and cold, we did resist the temptation to pause at Tyre, and actually reached Acre that afternoon; but here we incontinently gave up our plan, and dashed into the city. Never was shelter more welcome. We found such lodgings as we had had in Tyre, and slept soundly in spite of myriads of fleas.

In the morning I awoke, and found the weather clear and fine. John was sleeping soundly, but I roused him with a bucket of water. Capital places these oriental huts, where nothing is harmed by dashing a pail of water over a drowsy friend in bed. His bed was the corner of the room, its furniture nothing; mine had been as soft and warm,—the next square to John. He sprang to his feet, shook himself, and was awake — in fine humour; thankful for the bath, which we improved on by a plunge in the surf of the Mediterranean, and then we set off in search of our people.

Perhaps you would like to know what a night's lodging cost us in Acre — Akka, as they call it; Ptolemais of old fame. It cost three piastres, that is, eight-pence each, including a chicken and coffee in the evening, and two chickens and two coffees in the morning, and this we were obliged to force on our host, who was a Mussulman, and had taken us in from pure compassion. You will say that we might have paid him more liberally. So we might, but that it was necessary to offer no more than the market price, that our account might be square. We paid him what was customary, and he could not reproach us with using his hospitality and overpowering his merit by a large payment. Nevertheless, when we were mounted in our saddles again, John dropped into the hand of our host a piece of silver "for the poor," which — let us be charitable — probably went to the benefit of at least one poor wretch I could name in Akka.

It was high noon when we rode over the hills that commanded a view of Cana, the city of the miracle, now a deserted village. There was nothing whatever here to interest us, except the history which gave such sublime character to the hills and plain around the white houses of the little hamlet. All Syrian villages are alike:— a mass of low houses, usually built rudely of the white lime-stone of the country; the roofs are chiefly stone in the better houses, but in the poorer are brick and mud; the interiors are plastered walls and mud floors. Sometimes a partition of mud is built across, not rising to the roof; but usually the hut has but one room. Hence it is useless for me to describe to you the present appearance of these old places. They are all modern Syrian villages.

The tents were not at Cana. I enquired of the natives, but could learn nothing of Hassan and his people. So, turning our horses' heads, we crossed the country in the direction of Nazareth.

Two strangers travelling alone, and without guides and attendants, presented a tempting subject of robbery to the Ishmaelites of the hill country. Our intention to go to Nazareth was known while we were lingering and making enquiries about Cana, and three or four worthy inhabitants of the place laid a plan to intercept us.

We had scarcely advanced a mile on the way when we were met by a party suddenly riding down on us from a cross valley. Their intent, long before they reached us, was sufficiently manifest, and we drew up to meet them.

Some half-dozen times I have had encounters with these scoundrels of Syrians, and found them always alike, thorough cowards of the most cowardly sort.

As they came down on us we drew our revolvers, and covered them. The demonstration was sufficient. They pulled up suddenly, and paused in a mass to consider.

"Who are you?" they demanded.

"None of your business," was the cool reply.

"But it is our business. These are our lands. This is our country."

"This is God's land, and by the help of God we are passing through it; for he is the special protector of Englishmen."

"What do you wish?" they asked.

"Only that you go quietly by that road to Cana. If you go not, in three minutes the vengeance of Allah will descend upon you in the shape of bullets of lead. See, we carry the weapons of Satan"—and I showed them the barrels of a revolver pointed at their heads.

The leader fell from his horse to the ground at the sight, and crawled up to John's side, and began kissing his foot.

We ordered them home, and home they went, we taking care that they should not see our backs till they were on a hill out of the reach of bullets, and then we went like lightning over to Nazareth.

As we descended the ravine on the side of which Nazareth is situated, we caught sight of the tents of a party of travellers among the olive trees which are near the Fountain of the Virgin and the Greek Church. They shone white and pleasantly among the dark green foliage, and in a few moments we could see our own dingy canvas among them, and recognise our servants, who stood in front of the fountain. They did not shout as we approached. There was, on the contrary, a profound silence over every thing, which we had difficulty in explaining. We rode up at a gallop, calling out to Selim as we approached, to know if all was right.

All was right with our affairs; but the other tents proved to be those of our late fellow travellers, and the lady was lying very ill —they believed dying.

The intelligence was a shock. We had thought of meeting them again; but when we parted at Samaria we were all confident she was so much improved, that all apprehension of danger for her health and life were gone.

You may think it somewhat strange that our approach to Nazareth, the place of the youth of Christ, should have failed in producing sufficient impression on us even to keep in our minds the idea that it was Nazareth, when we heard this sad story of our fair companion. But there was something about that young girl—a gentleness, a purity, and withal a glow of enthusiasm, which had endeared her to both of us more than I can tell you. I had laughed hitherto at John's delicate attentions to her; but my honest friend, frank and generous in all his dealings, did not love the beautiful American girl any more sincerely than did I and every one else who met her in her sad pilgrimage.

We found her lying in the tent, on the low iron bedstead, pale, calm, and cheerful, but manifestly very weak, and very near that end of earthly pilgrim-walks to which we are all more or less rapidly travelling. She welcomed us with a cheerful "Good afternoon," and spoke with the utmost delight of the few days of pleasure she had had since we parted. From Samaria they had crossed the southern branch of the plain of Esdraelon, resting at various places, among which was one day at the tower of ancient Jezreel, and another at Nain, and yet another on the summit of Mount Tabor. "It was so glorious," she said, "on that hill top, to look around on Galilee, and down into the blue depths of the Lake of Gennesaret!"

We have been resting now one week at Nazareth. This is the eighth day, and she is to-day stronger and better. She has had changes — now for the better and now for the worse. Meantime we could not go and leave her or her friends. I shall have a busy time while we remain here. I have already marked out a dozen points of view of Nazareth and the surrounding country. Every spot is teeming with historical interest and natural beauty, and I long to set to work with my camera, for a rich harvest awaits me. But I sigh for collodion, wet or dry, "neat or preserved."

It is a long time since I saw a number of The Photographic Journal, and I look forward to the coming batch with as much interest as a school-boy for his plum-cake.

D. T.

Meetings of Societies.

ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

The opening of the Exhibition of this Society, on the 8th instant, was inaugurated by a *conversazione* at the rooms, No. 9, Conduit Street. There was a full gathering of members and visitors, who appeared highly delighted with the entertainment provided for them.

The photographs hung around the gallery are well classified and arranged, so as to be displayed to the best advantage. The subjects are sufficiently varied and interesting, being drawn from the Holy Land, Turkey, the Roman States, and Rome itself, Northern Italy, Spain, France, and our own country. They are the productions of many of our most eminent photographers, including Messrs. Bedford, Bent, Clifford, Cundall, Cocke, Downes, Fenton, Greenish, Macpherson, Melhuish, Ponti, &c.

The chair was taken by Professor Cockerell, President of the Royal Institute of British Architects, who addressed the company, and introduced Professor Donaldson, who he said would explain and illustrate the photographic pictures forming the collection.

Photography the Instructor of the Architect; and Architecture the best Subject for the Photographer.

Professor DONALDSON, who was received with applause, first described his interview, in 1840, with M. Daguerre. He then proceeded to say, that photography, in relation to architecture, was one of the most important discoveries of the age, and extremely useful to architects, whether regarded as artists or men of science. The simplest building, devoid of meretricious ornament, lost nothing when made the subject of a photographic picture, while, at the same time, the most elaborate structures of Rome, mediæval monuments, &c., were depicted in all their elaborate details and correctness, light and shade. Each point had its due prominence, and all were harmoniously subjected to due relations with the whole. The rapidity with which photographs were taken was a very important consideration; for in foreign countries, where suspicion followed the footsteps of the lover of art, it was sometimes found necessary for him to abandon his task before he had succeeded in sketching his view. When travelling in Asia Minor, he had often diverged from the direct road to catch a glimpse of some important or interesting spot, and often been forced to depart without obtaining the views which he wished; whereas, with the apparatus photographers employed, it was possible in a short time to obtain a correct and vivid image of the desired object. Had photography been discovered two or three hundred years ago, what precious memorials should we not now have had of countries visited by Benjamin of Tudela and Marco Polo! What mementoes should we not have had of Asia Minor, and Greece, and other parts of the classical world!

The Professor then drew attention to the various photographs in the room, in the order in which they were classified and grouped. Commencing with Rome, he remarked that there were many associations connected with the word Rome of a religious and an artistic nature, and he almost shrunk from venturing upon a subject which seemed to rise so immeasurably high. Two of our countrymen, Messrs. Macpherson and Anderson, were among the principal photographers of Rome. The first-named artist had contributed several views in Italy and Rome to this Exhibition; amongst them was that scene of desolate, solemn grandeur, *The Roman Forum,* the scene of the renowned amusements and games, where eighty thousand persons could assemble within its ample walls to witness them—where hundreds of lions were brought into the arena to try their strength, and where numerous gladiators, and probably Christian martyrs also, fought and died. He would call especial attention to the views of the Colosseum at Rome, as combining gracefulness of effect and correctness of detail in a most harmonious whole. He also pointed out the views of the temple of Antoninous and Faustina, and the theatre of Marcellus, whose arches were now occupied as common dwellings, and one of the lower arches of which was used as that smith's shop so well known to all the art-students of Rome. Other Italian towns and cities were mentioned. Assisi with its temple of Minerva, and Narvi with the bridge of Augustus, which still remain to excite the admiration of art-students.

The combination of grace, harmony, and beauty in those Roman monuments revealed to the mind a new world of delight. He felt that he could not pass over this portion of his subject without bestowing an eulogium upon that wonderful artist, Peruzzi, whose thorough knowledge of perspective, whose vivid imagination, and whose skill in the combination of light and shade, gave him a peculiar power in grouping, and the result of which was a series of views which overpowered all criticism, and carried one away with enthusiasm.

Following the flight of the Roman eagle, the Professor next led his audience into Spain, and traced the influence of the Roman struggles with Carthage, in that country, upon the growth of art; as manifested in the numerous remains which were so beautifully depicted by Mr. Clifford in his photographic views. He alluded more especially to a view of the ruins of the Roman theatre at Merida, and a beautiful picture of the interior of a corridor of the Alhambra. Among the numerous other views, claiming particular attention, the Professor pointed out the Gothic architecture on the door of *Santa Maria del Mare,* and of the cathedral at Leon, as showing how specific minuteness was, in those pictures, blended with the grand and the sublime. More modern art is illustrated in the Puerta de Alcala at Madrid, and in the theatre and custom house at Barcelona. These were evidence of the art-feeling that still existed in Spain; although they were not so pure and lofty as those which existed in other capital cities of Europe. There was, however, much of art to be learned in that country. The Spaniards were a people of vivid imagination; and when they enjoyed the vast wealth drawn from America, they employed artists of the first reputation to ornament their religious and secular edifices, and paid them liberally. Their past works are full of suggestive hints to warm the imagination of artists from the colder regions of Northern Europe.

Passing on to Venice, the Professor gave a succinct history of the numerous works of art which are to be found in that renowned city, drawing a distinction between the classical and elevating features and those that were wild and voluptuous. He described the Venetian merchants, endowed with great taste, and liberal in their patronage of art, who devoted their time and money to the adornment of their public squares, churches, and public edifices. Much of this refinement in taste might be attributed to their intercourse with Byzantium, whence they derived many of their most striking monuments.

The views in Venice exhibited in the room were very numerous and beautiful. We might fancy ourselves walking in the midst of the façades, columns, monuments, and palaces of that city of the waters. The view of the *Palace of the Doge* was one of the most striking monuments of modern art.

The Professor observed that the photographic views in Venice are characterised not only by faithfulness, but by a certain richness and strength of outline peculiar to photography. In the course of his remarks he touched lightly upon many points of interest, historical and classical, connected with several of the views exhibited. Referring to cathedral architecture, he said there was nothing more wonderful than the boundless expenditure of the Christian church during the brief three centuries of the mediæval period. The erection of Gothic cathedrals was entirely a gratuitous work. We could not traverse the length and breadth of England without being struck with the number and beauty of the religious edifices erected within this period; and in France, Germany, and Spain, there were similar indications of that ardent spirit which resulted in the erection of cathedrals and churches of vast extent, rising many hundred feet towards heaven. The monks went from palace to palace, and from cottage to cottage, gathering from all classes of the people the means wherewith to build these edifices. The English cathedrals were illustrated by many views in the gallery. The civil and domestic architecture of the mediæval period was also illustrated by many striking views; and our own true, happy England, with its Gothic abbeys, churches, baronial halls, and colleges, were illustrated by many views in the gallery. In connection with these works he would mention the names of Mr. Fenton, Mr. Cocke, Messrs. Dolamore and Bullock, Mr. Robinson, and Mr. Bedford, the latter of whom was not only well known to the profession as a photographic artist, but was particularly successful in his combinations of building and landscape scenery—views remarkably clear and distinct in all their various tones.

The Professor concluded his remarks by saying that his object had been to offer a few brief passing suggestions to guide the inquiries of others; to show how fine a subject architecture was for photographers, and how, in return, photography might become a teacher of the architect.

The discourse, which we have but briefly sketched, was listened to with great attention and interest, and the Professor, upon resuming his seat, was greeted with much applause.

The CHAIRMAN then rose and said that he was quite sure he should be commissioned by the meeting to offer to Professor Donaldson their most sincere thanks for his admirable paper, to which he had listened with the greatest interest, and which was worthy of the highest admiration.

The resolution was passed; and, on the motion of Mr. MAIR, a vote of thanks was unanimously accorded to the Chairman.

LONDON PHOTOGRAPHIC SOCIETY.

THE Anniversary Meeting of the above society was held on Tuesday, the 7th instant. The President, LORD CHIEF BARON POLLOCK, occupied the chair.

The attendance of members was smaller than usual.

The minutes of the last meeting were read and confirmed.

The CHAIRMAN: Gentlemen, I have to congratulate you upon our assembling at the commencement of another year of our Photographic Society.

The first thing that I have to notice is, that I believe this is the last time that we shall assemble in this room upon the occasion of an anniversary. We have given notice that we quit these premises next midsummer, and I hope the general body of the society, when they learn that we pay £300 a year for these premises for accommodation which we formerly obtained for £50 a year, will think that we have acted a very wise and prudent part, when we found that the only benefit that we

derived from the change of position was increased expense, without any countervailing advantage. The situation turned out not to be eligible; and it is remarkable that the Photographic Exhibition held in these rooms was the only one at which Her Gracious Majesty did not attend with H.R.H. the Prince Consort.

I have to announce that the expenditure of the society has not exceeded its income, and in these days of increased expenditure I think that is, to say the least of it, very gratifying.

I am sorry that I cannot report any large increase of members: we certainly have had no decrease.* I think that precisely the same number have quitted us as those who have joined us; perhaps we have one or two more members now than we had in the beginning of the year.

In speaking of the losses the society has sustained, I have occasion to mention that we have lost the presence and encouragement of Lord Londesborough, who devoted a very large portion of his income liberally to the support of art and science in various directions, and who was a warm friend of the Photographic Society; and I regret to say, also, that we have lost the elder Mr. Ross, whose firm is so well known to every gentleman connected with this society by their remarkable production of lenses for all purposes, either astronomical, photographic, or microscopical.

There was a disagreeable circumstance — I believe the proper mode of speaking of it would be to term it a sort of sore place — which arose out of the supposed occupation of the title of the Society's Journal by another publication devoted to photography. We instituted proceedings in chancery, and all those who know anything about law, and particularly that branch of the law which is called chancery, know that it is better not to go into it, and if you are in, the best thing to do is to get out of it. I do not speak of these matters disparagingly. I assure you that it would be more gratifying to me if I could speak of the law as a study of the greatest delight, and the practice of it as the greatest comfort, and I believe it is so, in fact, to those who occupy a certain position; but when one becomes either as a president of a photographic society or in any other capacity a litigant party, one takes a different view of the subject: it is seen in what is called *another light;* and I am sorry to say we incurred some expenses, and derived very little profit. We must console ourselves, I suppose, by the application of the observations of Dean Swift, with respect to the mistakes that tailors made who measured people by mathematical instruments instead of by the common measure of tape, and so on — everybody was satisfied when he found that his neighbours were in the same position as himself. We have a large number of our neighbours, in common with ourselves, who bore expense and disappointment, and it is very gratifying to find that at length this matter has received what is called an amicable termination.

There was a matter which I mentioned a year or two ago to the society — I mean the discoveries of a foreigner, of the name of Nièpce, who succeeded apparently in bottling light. It was a subject which, in the first instance, promised to be of the most interesting kind; and I own, when first it was announced, it appeared to me to be a step towards very brilliant discoveries with reference to the action of light, and to an investigation of what is the true nature of that medium — if it be a medium — or if we are to go back (and I believe it is going back) to the theory of projection of light, — of what is the course of the rays. One of our most distinguished members is very doubtful of the fact announced in this communication, and I am much in the habit of giving large credence to the opinions of that gentleman in matters of philosophy, and in his own sphere — I mean Mr. Hardwich; but, undoubtedly, there are some in the society, and I believe there are more out of it, who think that the experiments have been so far repeated that they may be considered as successful. It appears to me that it is very desirable that we should ascertain, as far as we can in our own private laboratories (if I may so say), what is the real fact, whether these curious experiments, which really amount to the bottling up of light (for that is what it comes to), are trustworthy. I do not know anything that originally promised to elucidate the theory of vision more than these experiments of M. Nièpce. I repeat that I have the highest respect for the very distinguished member of our society alluded to; but I cannot help wishing, with all my heart, that he may in this instance turn out to be wrong, for I am really very impatient that the Photographic Society should do something more than merely contribute to art, and that from day to day it should more and more astonish the world by its discoveries in science.

Gentlemen, I am very happy to say that I believe the society is safely progressing from year to year: its communications are received, I believe, by the scientific and practical world with greater confidence than ever. We are apparently flourishing. We are contributing, in an eminent degree, to the records of those matters which are of a fleeting character, and which, if they are not recorded by photographers, would perish altogether.

I think I ought to mention that this year we returned to our old room in Pall Mall, and that the photographic exhibition there has been quite successful. H.R.H. the Prince Consort visited it, and expressed himself highly gratified. We seem to be steadily progressing, and I have no doubt that, with your united efforts to do whatever can be done in this direction, prosperity will attend us, and the photographic art will become that which it ought to be—one of the signal blessings to mankind of the present day.

* The Secretary in an audible whisper informed the Chairman that forty new members had joined the society during the past year, and that its present number of members was greater than before.

At the conclusion of the President's address, F. Scrivener, Esq., Warren De la Rue, Esq., Edward Van Notter Pole, Esq., Messrs. Heath, Ruland, Bennett, Claudet, and Telfer, were duly elected members of the society.

The Secretary then read the report, which was duly received; but, as it contained no matter of interest beyond that previously given by the President, we do not think it necessary to give an abstract of it.

Mr. Kilburn was afraid he was not in order, but as his lordship had mentioned the exhibition, he was anxious to ask a question which had resulted from the present exhibition. There were three pictures exhibited under the name of ——* and purporting to be the productions of that gentleman, which were coloured by Mr. Kilburn's own artists, whom he engaged by the year at salaries varying from seven to ten guineas per week. As he apprehended that all pictures at the exhibition were to show the proficiency of the exhibitors, he could not conceive that pictures which were taken at the exhibitors' establishment and coloured by the artists of another establishment could represent that — the fact, unfortunately, was too prevalent. With some of the low members of the art it was the practice to exhibit works at their doors imported from France, but certainly not their own productions. He hoped the committee would withdraw the pictures, inasmuch as supposing the public should patronise the establishment of the exhibitor, he could give no guarantee of excellence, since the artists who painted the pictures were under permanent engagements to him (Mr. Kilburn). Perhaps giving publicity to the trick would meet the exigencies of the case.

The Chairman did not think the meeting could do more than receive a notice of motion.

Mr. Crace stated that the society made it a condition that all coloured photographs should be accompanied with a pure untouched specimen, which was the real standard of excellence — all artistic skill brought to bear upon it afterwards was extraneous; and he thought that this was purely a question beween the two exhibitors and not a fit matter to absorb the time of the society's meeting.

The Chairman asked whether any gentleman would propose scrutineers; if not, he himself would recommend Messrs. Shadbolt and Kilburn.

Mr. Shadbolt suggested a vote of thanks to Mr. Rosling, the late treasurer, which was duly moved, put, and carried.

The Chairman stated that the Collodion Committee had made a report which was upon the table. [See page 48.] If it was the wish of the meeting that it should be read, the Secretary would have great pleasure in reading it.

Mr. Heath: My lord, I may venture to make a remark upon that report. I cannot help thinking that as this evening is devoted to the annual business of the society, it would be a pity, at so late an hour, to enter upon the discussion of one of the most important papers that ever came before the society. Now, whether I shall have the good fortune to carry the meeting with me or not, I do not know, but it appears to me that a paper of that consequence and importance ought to have an evening to itself. I do not speak of the matter in any hostile spirit, but considering the importance of collodion itself, I think that any paper that comes before this meeting as a report of a committee upon that substance, should receive more attention than it can at this meeting. I will go further, and say, that we shall be most jealously and most carefully watched by all societies and photographers throughout England, and all Europe, and before we put our seal, either of approval or not, upon that report, we ought to have plenty of time for consideration and discussion, and I therefore would, with the consent of the meeting, move that this report shall not be read to-night, or published in the Journal, but shall stand over for discussion and consideration at the next meeting of the society. If any gentleman will favour me by seconding that motion I shall be glad.

The Chairman: Will you allow me to suggest that if it be the object to discuss the report at some future meeting, it will be desirable either that it should be placed in the hands of every member separately, or that it should appear in the Journal of the society as quickly as possible.

Mr. Heath: My objection would be, that if that report were published in the Journal of the society, it enters at once upon the transactions of the society, and takes its place just as much as if it had been received and passed as the act of the society.

Mr. Crace stated that it would be the act of the gentlemen whose names were appended to it, and of them only.

Mr. Kilburn moved, as an amendment, that the report be published in the society's Journal, as this course would be more likely to originate discussion.

Mr. Crace: I second that amendment, because I think it the simplest way, and a saving of expense.

Mr. Heath: The Journal goes into the hands of gentlemen who are interested in photography, and who are not members of the society, whereas it would be perfectly simple, if it were intended to raise discussion upon the matter, to supply every member of the society with a copy of the report before the next meeting.

Mr. Shadbolt: I think perhaps Mr. Heath is under a misapprehension

* We refrain from mentioning the name, as their owner was not present, and we do no want to be plunged into an action for libel, which may not have an amicable termination

as to the report. At the last meeting it was announced that the report would be issued, and consequently it will be somewhat stultifying the society if it be not issued. Moreover, there has always been standing in the pages of the society's Journal a notice to the effect that the society could not bind itself to the opinions either of the contributors or even of the editors, consequently there cannot be any mistake as to the report put forward by gentlemen whose names are appended to it.

The CHAIRMAN: Perhaps it would save any further discussion if the motion were carried unanimously, thus:—that the report should be published in the Journal of the society merely as a report, with an intimation that it would be taken into consideration at the following meeting; and, as remarked by a member, such a course will be more consistent with economy, inasmuch as circulating it separately is not without some expense.

The motion, as suggested by the Chairman, was carried unanimously.

The annual ballotting of officers having taken place—

The CHAIRMAN: The scrutineers report that the five members of the present Council recommended to retire are the Rev. J. Barlow, F.R.S., P. W. Fry, Esq., J. D. Harding, Esq., M. J. Rippingham, Esq., and Alfred Rosling, Esq.; and that the members recommended to be elected into their place are Professor Delamotte, J. Durham, Esq., F.S.A., Dr. Arthur Farre, F.R.S., J. D. Llewellyn, Esq., F.R.S., and Professor Wheatstone, F.R.S. The scrutineers also report that the President for the present year is he who has now the honour of addressing you and thanking you for his election. The Vice President is C. B. Vignoles, Esq., F.R.S.; and the Treasurer is A. R. Hamilton, Esq.

The thanks of the meeting were awarded to the Chairman.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of the Association was held at Myddleton Hall on Wednesday, the 25th ultimo; T. A. BARBER, Esq., in the chair.

After the confirmation of the minutes of the previous meeting, the Rev. James Galloway Cowan was duly elected a member of the Association.

The CHAIRMAN then called upon Mr. Hughes to read his paper.

Mr. HUGHES, after a few preliminary remarks—in which he stated that although he had nothing new to communicate, he had invariably found that those friends who had tried the process he was about to describe met with difficulties and disappointments to which he was a stranger—said that it was with the hope of removing these troubles he was induced to pen the following paper,—*On Toning with Alkaline Chloride of Gold.* [We are compelled to postpone Mr. Hughes's paper till our next number.]

At the conclusion of the paper, a vote of thanks was given to Mr. Hughes, and a discussion ensued.

Mr. D. W. HILL did not find any advantage ensue from warming the gold bath: the strength he used was one grain of chloride of gold to six ounces of water.

Mr. HUGHES replied that with a solution of that strength warming was unnecessary, but if he used one grain of gold to twenty or more ounces of water it would be advantageous; and it was better to use a dilute solution where many prints were to be toned, as they could be all immersed at once, and by constantly removing the bottom one to the top they could be carefully watched, and when sufficiently toned placed in a dish of water at hand. One grain of gold he found by experience would thus tone 500 square inches; and with regard to the depth of tone produced by such a weak solution, he would call attention to a very large portrait on the table, with a broad margin of between two and three inches, which was of as deep a purple-black as could be produced by any process.

The CHAIRMAN hoped that as Mr. Hardwich was present he would favour the meeting with his opinion on the process under discussion.

Mr. HARDWICH said he had looked in on his way home, and had no idea of taking part in the proceedings; nor was he aware that a paper on the subject of toning was to be read. First, with regard to photographic paper, he thought the size used was of as much consequence as the albumen, in the production of colour, and that it would be a great boon to photographers if the subject of sizing were more thoroughly investigated, so as to render them independent of the foreign market. This had been done to some extent, and samples had been sent to him (Mr. Hardwich), but the processes employed had not been divulged. He found that it was possible, with some paper, to use a much weaker sensitising bath than Mr. Hughes recommended—a forty-grain solution being sufficiently strong: it was true he floated the paper for six or seven minutes, until the nitrate of silver could be tasted at the back.

To remove the colour from the sensitising bath he greatly preferred kaolin: he had used salt, but it weakened the solution, and was not so efficacious. The most important subject, after all, was the toning bath. It had been said that the auro-chloride of sodium was all that was actually necessary. This might be the case, and yet, nevertheless, a little alkaline carbonate in excess might modify the colour; such, at all events, was the opinion of Mr. Waterhouse, who first described the process. Citric acid was not an essential ingredient; but he found that by using a citrate he produced a more decidedly purple tint, and it enabled him also to keep the print longer in the bath without its becoming slaty. He believed, however, that much depended on the paper, and he would not be understood to speak positively: it was not a matter of chemistry, but rather of shades of colour, about which no two people would precisely agree. Some succeed more to their fancy with carbonate of soda,—others with phosphate of soda.

Mr. Hughes did not state how long he used the hypo-bath. He (Mr. Hardwich) found that by adding a little alkali he could use it for a length of time. There certainly was a slight trace of sulphuration, as in the sel d'or process, but not enough to affect the permanency of the print. He had used but one bath through the summer; nevertheless it was still in a safe condition, for an ordinary untoned picture immersed in it for half-an-hour remained nearly red. He did not know that he had any thing further to say, unless to express his regret that many persons still continued to use the old process of toning in hypo and gold. An idea just crossed his mind, that if all who wrote on photographic subjects would agree not to publish anything more about the old process it would die out by degrees.

The CHAIRMAN asked if a picture were taken on albumen alone—that is to say, albumen on porcelain or glass—would that picture be red?

Mr. HARDWICH thought it would. There was much in the chemistry of albumen yet to be discovered.

Mr. HUGHES, in reply to the Chairman and other gentlemen, said one would suppose the picture to be in the albumen; but that could not be entirely the case, because the colour of the picture was greatly influenced by the nature of the size of the paper. He had a paper by him which would produce a red tone only, and this was albumenised by himself at the same time with other papers of different makes, and with all the rest he could obtain a deep black violet, violet-brown, or any other tone he wished. With regard to the auro-chloride of sodium, a friend purchased some at one of the best London houses, and he declared he could get no trace of gold on his prints after an immersion of half-an-hour in the bath. He always recommended the use of chloride of gold diluted to a known strength with distilled water. Then, as to the hypo-bath, it was undergoing continual change, much to the consternation of his assistant, who declared that, all through the hot weather, when the contents of other dishes decreased in bulk that in the fixing dish kept on increasing. The fact was, he made no allowance for the water taken up with each batch from the washing dish, when they were immersed in the hypo, and which amounted to a considerable quantity when some hundred were passed into it; his practice was to pour off some of the bath each morning and add crystals of hypo, so that, although he might say he always used the same bath, it was continually undergoing a replenishing; but for the public he thought it best to recommend a fresh bath each time, and of the strength named in his paper.

The CHAIRMAN asked if any member had tried the bi-borate of soda?

Mr. HANNAFORD had tried it, and also the carbonate and phosphate of soda, with all of which the result was the same. The acetate produced a beautiful purple-maroon, precisely similar to that obtained by the use of citrate of soda, suggested by Mr. Hardwich. The acetate has an advantage over the citrate, inasmuch as it can be obtained ready prepared.

A vote of thanks was unanimously accorded to Mr. Hardwich for the part he had taken in the discussion.

Mr. HARE exhibited a swing-back camera of novel construction, also a binocular stereoscopic camera with velvet body, double dark slides, and moveable front; but owing to the lateness of the hour there was no discussion on their merits.

The CHAIRMAN reminded the members that the nomination of officers for the ensuing year would take place at their next meeting, and he hoped there would be a large attendance on that evening.

The meeting was then adjourned to the 29th instant.

N.B.—Those members who have not yet received their Presentation Photograph can obtain it on application to the Secretary.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A MEETING of the members of this society was held at the Odd Fellows' Hall, Birmingham, on Tuesday evening, the 31st ult., Mr. HAINES, one of the Vice-Presidents, occupying the chair.

The paper for the evening, entitled *Hints Connected with the Dry Processes*, had been contributed by GEORGE SHADBOLT, Esq., of London, Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, and was read by Mr. BROWN, the Honorary Treasurer. [See page 47.]

In the discussion which followed the reading of the paper, Mr. W. B. OSBORN said that probably few of the members present had had more experience in dry collodion than himself, and more especially with regard to Dr. Norris's process. Mr. Shadbolt's remarks as to the nonsensitive patches caused by white paper on the edges of the plates were quite correct, as these had been noticed by almost every worker with dry collodion plates. The fact was a curious one, and very difficult to be accounted for. If they took one of Dr. Norris's plates, poured upon it a little distilled water, and allowed the water to remain for about one second before pouring it off, they would find that that part of the plate would present on development a perfectly insensitive patch, no matter whether the water was poured on before or after exposure. Then, again, if they carried the plates in a wooden box, or in a box of cardboard, or any other substance which would harbour moisture, the same drawing away of the sensitive portion of the plate was the result. Last summer he (Mr. Osborn) took some dry plates into Wales, and carried them in portable

pasteboard slides; and whether it was that the slides were damp, or from his being near the seaside, he could not positively say, but he found on proceeding to develop the pictures that they had a great quantity of insensitive patches, more especially towards the edges, and also in those parts where they touched the paper slide. This was the more remarkable, because the trial plates which had not been in the slides were quite perfect.

Mr. Norris said he could corroborate the statement of Mr. Osborn. It frequently happened that if they exposed a plate and carried it some distance in a slide, the picture vanished entirely. Of two pictures taken at the same time, one, when developed on the spot and immersed in water, might turn out well, whilst the other carried twenty miles and developed next day, might be a failure.

Mr. Ball: It does not follow as a rule.

Mr. Norris: Unless the slides are varnished or polished, you find great difficulty in developing a picture after long keeping. I think the only safe way of carrying them is in metal slides, which I used fifteen years' ago with the Daguerreotype process.

Mr. Ball: Last summer I took a couple of dozen pictures at Kenilworth, and though none of them were touched for three months, the whole developed well.

Mr. Hart suggested whether, as there was more or less moisture in the atmosphere at all times, the plate might not be robbed of the iodide of silver by the conducting substance.

Mr. Osborn: No, I do not think so; because if you take a dry collodion plate which you have reason to suppose has been over-exposed, you may, by submitting it to the vapour of acetic acid, restore it to a fit state for a second exposure; if the iodide of silver were withdrawn from it you would no longer have any sensitiveness whatever. If you were to take a plate and expose it to full daylight for a second or two, so that it might blacken all over in development, yet by placing it over a vessel containing a little acetic acid, you would destroy all the previous impression, and then you might take a picture.

Mr. Turner: Can you throw any light upon the film rising in blisters? In the albumen dry process I should imagine it is through the collodion being too old.

Mr. Osborn: I think the reason is due to the different contractile power of the two bodies employed, and to the want of sufficient adhesion between the collodion and the glass. If your glass is not absolutely clean you will certainly get blisters in any process; but I believe that in the present case the reason is that the albumen contracts more rapidly than the collodion, and therefore takes up the collodion with it in the form of a blister. The greatest difficulty in working Norris's process is in the washing off of the film altogether, when probably the picture is nearly developed; this is generally due to using an improper collodion.

Mr. Turner said he believed the use of one ounce of a year-old collodion to three ounces of new collodion, would prevent all washing off, and would give a richness of detail which new collodion, say three months' old, would not produce.

The remark of Mr. Brown, that he wished Dr. Hill Norris had been present, led to a suggestion that the discussion should be adjourned, in order to give that gentleman an opportunity of coming amongst them on a future occasion. It was resolved that this should be done, and the meeting on the last Tuesday in March was fixed for the reopening of the discussion. The occasion will be an interesting one, as the merits of wet collodion *versus* dry will be exemplified by the best pictures produced by each process in the neighbourhood of Birmingham. Mr. Breese, a distinguished local amateur, who was present at the meeting, happened to mention that he had never seen a really good picture produced by the dry process—he meant a picture which had atmosphere in it, or any of the higher qualities which the wet process was capable of producing; whereupon Mr. Osborn and others challenged him to produce some of his "wet" pictures, and promised to bring the best "dry" ones they could procure. Mr. Breese accepted the challenge, and as he is probably one of the most successful photographers in England (as the series which, at her Majesty's request, he sent to the Queen last summer proved), the result of this friendly tournament is looked to with much interest.

A hearty vote of thanks to Mr. Shadbolt brought the proceedings to a close.

[This Journal having now become the sole representative of the Birmingham Photographic Society, the reports of that body will, in future, appear *in extenso* in our columns; and, from the arrangements which have been made by the Council to secure papers of great interest, we think the society in a very fair way to achieve success.]

MANCHESTER PHOTOGRAPHIC SOCIETY.

A Meeting of this society was held on the 1st instant, at the rooms of the Literary and Philosophical Society, 36, George Street; Mr. Parry in the Chair.

Mr. Mabley explained that he had not been able to prepare his paper *On the Paper-Printing Process* as he had intended, but would have it ready for the next meeting.

The Hon. Secretary read a letter from Mr. Davies, of Warrington, presenting six photographs for the Society's portfolio; also suggesting that the Manchester Photographic Society might form a Photographic Exchange Club, on a similar plan to the London one, and that he (Mr. Davies) would willingly join such a club.

The plan of the London Club was stated to be something like the following:—A club is formed of a certain number of members, say fifty, each member contributes as many copies of his own negative as there are members, and receives in exchange a copy of each member's contribution, including one of his own, bound up in the form of a book.

The subject was generally discussed and approved of by the members, and it was suggested that those who were willing to join should send in their names to the honorary secretary, and that the subject should be brought before the next meeting for further consideration.

Mr. Cottam contributed a copy of the landscape photograph taken by the panoramic lens.

A very animated and interesting discussion took place on various subjects by those present; and after a vote of thanks to Mr. Parry, for his services in the chair, the proceedings closed at about nine o'clock.

Exhibition.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

Since I last communicated with you I find that your journals and two others reached the address I gave you, to await me in Edinburgh. Circumstances prevented my writing in time for your last publication, as I purposed doing. Since then I have been enabled to pay the Society's rooms several more visits; and I now find that Mr. Brady's (New York) picture, No. 269, is labelled "*touched picture*," perhaps in consequence of the remonstrance in your Journal. An addition has also been made in the interim of a portrait of John Brown, the noted Harper's Ferry martyr. He is a tall, brave, noble-looking fellow, with independence stamped by nature on his manly brow; as physically strong in limb as inflexible in purpose, and worthy the respect of every conscientious man and philanthropist.

I shall begin my remarks with Mr. H. P. Robinson's (Leamington) compositions. They have, no doubt, cost much trouble and great care, yet they are not effective or pleasing to the eye. There is a vacuity and emptiness, both of subject and detail, in nearly all of them, and often an incongruity in their several parts. It requires a peculiarly constituted mind to grasp and delineate, in an imposing manner, ideal pictures assimilated to nature, so that the several parts shall be proportionate in degree, and in keeping with the subject designed to be illustrated. I am, notwithstanding, happy to observe that the Society has awarded its first medal to Mr. Robinson's picture (No. 470), *Here they come!* in consideration of his untiring perseverance in this branch of the art, there being no other competitor in the field for pictures of this class.

Mr. Mudd, of Manchester, takes the other medal for his picture (No. 627), *Waterfall near Coniston*. This is a remarkably fine picture, and pleasing in every respect. It is an excellent composition—grey, time-worn rocks, over which a small cascade of water is falling in the immediate foreground, with glorious far-reaching undulating mountains in the distance, melting into the sky, conveying sublime emotions to the mind of the vast and glorious works of the great Architect of nature. Mr. Mudd contributes various other excellent pieces—such as No. 521, *Dunham Park, Cheshire,*—a study embracing lofty trees, with a winding avenue amongst the stems, bordered on each side by the green shaven sward, cooling to the feet and refreshing to the eye.

There are several excellent picked copies of Fenton's works, not sent by himself, but introduced by one of the dealers here. They are fine, rich landscapes—woodland and river—on the Hodder. They are clean, well-defined prints, fully equal to anything I have seen from his hand of late.

Messrs. J. Dixon Piper, Henry White, and Maxwell Lyte, all send good pictures. No. 529, Mr. Piper's *Gainsborough Lane, near Ipswich*, is a beautiful specimen, and perhaps the choicest of his contributions in landscape. But he excels also in architectural subjects. Nos. 265, *Abbey Gate*, and 292, *Norman Tower, Bury St. Edmund's*, are without exception the finest specimens of architecture on the walls. There is scarcely any observable aberration proceeding from the curves of the lens; the lines are nearly perpendicular, all in good focus, and the proofs altogether are very choice and effective.—Mr. Lyte's pictures are mostly mountain scenery in France. They want breadth and atmosphere; they are by the metagelatine process, and greatly inferior to Mr. Mudd's.—Henry White remains steadfastly attached to his Scotch firs and corn-fields. I should like to see the result of his trying an ash, or silver birch, "The Lady of the Woods," with its quivering leaves. I

have seen an ash and willow tree here, though not in the Exhibition, most perfect in the foliage, and the leaves beautifully distinct.

Mr. Morgan, of Bristol, sends some artistic specimens, the composition good, with fine aërial effect; but I think they are scarcely up to the mark of those exhibited by him last year. No. 674 is excellent, and has in it the elements of a rich landscape: a light, lofty Roman arch, overhung with ivy, the water in little streamlets gurgling through amongst large rounded stones, with high, rising, naked, barren rocky cliffs in the distance. Several other by this artist are very successful studies.

There are very few albumen proofs. The most choice specimen is by Mr. M'Pherson of Rome — subject, *The Forum, Rome,* well known among the dealers.

Maull and Polyblank, as usual, send a large quota of heads, two being office-bearers in the Scotch Society: — Sir David Brewster, the President; and William Walker, Esq., a Member of the Council. Sir David Brewster's portrait wants life and animation: it is more like the portrait of a statue than of an active, intelligent mind. Some are better, but all are indebted to the brush.

There is a curious selection of Indian subjects by Mr. Williamson, principally rows of figures in the same plane, entirely void of atmosphere and distance — such as *Indian Chiefs;* a *Hindoo on his way to be executed;* a *Mahomedan Priest; Religious Devotees;* a *Hedge School,* &c. They are curious for loungers to look at, but scarcely serve any other purpose.

The President of the United States—an enlarged portrait by Brady — is on the same screen, and in another frame a considerable number of his senators, combining every variety of countenance. But the gems are two heliographic pictures by Charles Negre, exhibited by the Manager of the Kensington Museum. They are large plates, representing the gorgeously elaborate architecture of the mediæval age. The proofs are taken from steel or copper, which is shown by the indentation on the paper. If these are really untouched specimens, and can be produced by the ordinary methods of steel and copper-plate printing, they indicate a very rapid progress.

The Messrs. Hay, as I mentioned before, send a large number of portraits, several of which are very creditable productions, but are inferior to those by Rodger.

Messrs. Brady (New York), Messrs. Cramb Brothers (Glasgow), and Mr. Ramage (Edinburgh), all try their hands at enlarging from smaller pictures. I would advise any one having a respect for his natural countenance to forbid this experiment.

Messrs. Kirk, Zeigler, and Walker all exhibit some pretty landscapes. The former sends the scene of one of the poet's choicest melodies—

"Sweet fa's the eve on Craigie burn."

This is a beautiful specimen of foliage in a deep dell, taken during a profound calm, nature being in perfect repose. It is the only paper proof exhibited by Mr. Kirk by the wet collodion process. — The other two gentlemen named above both exhibit views on the Esk, by the waxed-paper process. In this locality there appear to be some lovely spots well adapted for the panoramic lens.

Mr. McCraw seems to be devoting his energies to stereotyping public bodies and corporations, such as the Town Council and St. John's Kirk Session.

There is an other advantage to be gained by Mr. McCraw's taking the matter in hand: he can print by the everlasting positive ink process without silver — as witness No. 130, *The Scott Monument,* and a very excellent proof it is.

There are many more pictures deserving to be prominently noticed, especially those of Mr. Rodger, of St. Andrew's, whose portraits of Master and Miss Gordon (No. 87) have been awarded the ten pounds Maconochie Welwood prize. All his pictures are of the very highest class — "*peers in their own right.*" In pose, drapery, light and shade, detail, atmosphere, ease, and gracefulness, they are all that can be desired. Mr. Rodger is the veritable prince of photographers of all that exhibit in Scotland. Mr. McLeay paints well; but Rodger's works are more artistic and beautiful, without and entirely independent of the brush.

Mr. Moffats keeps his ground, and furnishes portraits of several well-known citizens, in chaste and pleasing attitudes.

Mr. Tunny is set down by the *Edinburgh Scotsman,* in a piece of sly sarcasm, as the "FATHER OF PHOTOGRAPHY;" I presume because a claim was put in for him as the discoverer of collodion in some of the Photographic Journals, better than a year since. Be this as it may, he exhibits a frame principally containing groups, packed with heads like herrings, making one rub his eyes as if he had been reading a double column of small print, for several hours by gas light. The *Grange School* must contain somewhere about a hundred faces, nearly all having *very small eyes:* they are by the wet collodion process.

Mr. Horatio Ross has had assigned to him the office I expected would have devolved upon the secretary — that of awarding the medals.

I believe a new society is greatly needed in Scotland, both for the purpose of encouraging the beautiful and fascinating art of photography, and for making suitable arrangements for properly exhibiting the productions of professional men (many of whose works are banished from the *line* to the lobby), since with the exception of *three or four,* they have all left the society, notwithstanding the secretary's disclaimer in a late number of a contemporary. SEL D'OR.

[We have received letters of complaint from Mr. Valentine, of Dundee, relative to the hanging of his pictures in the exhibition above noticed, which he asserts are, with one single exception, hung so high as to be almost invisible — the excepted one being the worst of the series. He also states that he received an uncourteous reply to his remonstrance.

None but those who have tried it know what an invidious task it is to arrange the works in any exhibition; but when space is limited the difficulty is enormously increased; — the pictures you want to be together wont fit, and those you desire to separate will; besides many other perplexities.

We trust that Mr. Valentine has been the victim of circumstances, rather than, as he supposes, intentionally slighted.—ED.]

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VI. *(Continued.)*

HATCHING.

This is a process of working with oblique lines, forming lozenge-like apertures, and indicating by their degree of curve and regularity the form and character of the surface represented. The lines should taper to a point at either end, as they then blend better into an uniform mass. In line engravings and chalk drawings, hatching exhibits great power of expression, every line representing the alternations of the surface and being capable of describing its texture; but in flesh these lines by being repeatedly crossed in different directions assume all the appearance of a stipple, and thus serve to express the smoothness as well as the transparency of flesh.* Carefully avoid crossing the lines at right angles, as you would then obtain the effect of net-work, and do not make them long. Commence with short, broad, tender touches, placed at regular intervals and in a nearly horizontal position, beginning with a rather firm pressure and finishing with a lighter one; with the same touch cross these lines horizontally and repeat the process at slightly varying angles until the requisite depth is secured. Avoid leaving little blotches of colour at the ends of the lines, and do not cross one set of lines with others until the first are dry. The part where the lines intersect will of course be darkest, but should not be strikingly so. Hatching is a far more artistic mode of working than "stippling," but the latter is frequently blended with the former to increase the "smoothness," or what is vulgarly and erroneously called "finish." Stippling is, to my thinking, only legitimate when it is used to even up any small space which has been left too light in the process of hatching.

STIPPLING.

What some folk would do without stippling I dont know, for like charity it "covereth a multitude of sins" — sins against common sense — and every quality of truth. It is painful to the real artist to hear the high praises constantly lavished upon productions breaking every rule of art, and displaying no better quality than that evinced by patiently and laboriously dotting over with a pin-point pencil a certain small space of paper. I'm sure I ought not to denounce it, for when I first began to experimentalise upon the public, that same mechanical stipple did me a world of good service; and there are many very worthy fellows, profoundly ignorant of painting, who support themselves most comfortably and with an immense amount of self satisfaction upon their stock of patience, dealt out in the shape of stipple to an admiring public at the rate of so many guineas per square inch.

Stippling, then, is simply the covering of a surface with a vast number of minute touches or dots.

It is of course much easier than hatching, and *perhaps* by its adoption you may obtain smoothness and softness—qualities which

* Hatching enables you as it were to look below the surface, or in other words gives that depth which could never be obtained by repeated washes.

I have no fault to find with if they do not blind the student to those of a much higher order, are in their proper place, and do not originate that thoughtless laudation which is so seriously dangerous to real progress. Most of the worst-drawn pictures I ever saw were stippled highest, and there is nothing in the use of this stipple which may not be won by the veriest "aprentice han," if its owner will not grow weary of the interminable and monotonous dot, dot, dot, dot, dot, of the process. Hatching educates the hand and eye, and implies a knowledge of form and texture. Stippling educates neither, and implies a knowledge of —— what? For rudimental study at least, therefore, pray adopt the method of hatching.

The author of the preceding paper has, in order, to render his communications of greater practical value, kindly undertaken to criticise the work of, and give advice to, students in colouring, through the medium of these pages, for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

Despairingly (Margate).—After inspecting your coloured print, and reading your sensible and pleasing letter, I consider you, on the contrary, a very promising pupil. I like to hear of difficulties recognised and courage sometimes daunted: it shows the courage to be real and the power great. Now for the advice:—In the first place, your eagerness to make good progress defeats its purpose; to be "*sure*" you must be "*slow.*" This I glean from the touches being much too hard and dark (which, had they been made by continual repetitions, would not have been the case), and by the lines being hard and cutting, which, had they been commenced faintly and strengthened gradually, would also not have been the case. Take a dose of patience, and begin again: you must walk before you run.

E. G. *or* E. J.—The latter portion of the above reply will answer this correspondent and "A Poor Gentleman," to which I must add, for the benefit of the last-named, that photographic colouring *is* remunerative, if it be well done. I know an artist, colouring for a first-class London establishment, who receives fifteen hundred a year; and I have heard of even higher salaries being paid. About three hundred a year I should say.

A Mechanic.—Why not? If you have the taste and ability you need nothing but industry, patience, and perseverance. I am glad to have been of such good service to your friend the photographer.

Miss D—— (Kingsland).—Read the reply to "Despairingly." Paper positives are not managed so easily as glass. The print is a very good one for the purpose. Your glass positive displays great improvement. The writer you speak of being evidently well acquainted with his subject, will doubtless be of use to you; and, whatever he may say of the "absorbent" colours, he will not exceed what Mr. Newman deserves, in praising the powder colours sold at that gentleman's establishment. For my own part, nowever glad I might be to tender my tribute of praise, I should (upon the score of good taste) certainly hesitate to denounce, in such terms, the productions of any special manufacturer. When I used dry colours I prepared most of them for myself, but have lately purchased them.

Robert Davis.—I intend to re-publish these instructions in a separate form, but not exactly in the way suggested. The hint is, however, worth consideration, and I may act upon it. If so, I shall be happy to forward any number of copies—"the more the merrier." Send it when finished: I can then judge better.

Dodsworth.—A failure. Re-read the instructions with more care and attention, and begin again. I am glad you appreciated the paper in question. I know the gentleman well, and respect him much: please to remind him of my whereabouts.

Ann Page.—The pictures have not yet reached me.

G. R.—If you forward me a specimen I shall be enabled to judge.

Foreign Correspondence.

Paris, February 10, 1860.

Mr. Omegauck, of Antwerp, states, as a fact of his experience, that a clean plate of copper, such as is used by engravers, heated to 250 to 300° Fahrenheit, and placed in the camera during the exposure of a collodioned plate, will diminish the time of exposure two-thirds, and will be found very useful in cold weather. I give you this as I received it: not having tried it I cannot say in how far it is correct.

A new *Photometer* has just been introduced to public notice; it is the invention of Signor Givi, Professor of Physics at the Technological Institute of Florence. He calls it the *Photomètre analyseur.* I will give you a brief description of it. The idea of this photometer was suggested by the difficulty we encounter whenever we wish to compare together two differently coloured lights. In this instrument the comparison is made only between rays of equal refrangibility. The principle upon which this photometer is constructed is easily understood. It must be premised that the lights to be compared are not simple. If such present themselves for examination, the judgment of several persons must be brought to bear upon them, and the mean of the opinions of all must be taken, for every eye does not see different colours alike.

The photometer consists mainly of a prismatic box, elongated horizontally, and having two openings in each of its vertical (and smaller) sides. In these openings two tubes are adjusted, each having a slit at its extremity; and in the middle of the box, exactly in the direction of the two slits (which are vertical), are fixed two rectangular icoseles prisms of pure glass, placed so that their hypothenuse sides are opposite each other, while two sides being vertical, the other meets by the acute dihedral angle, and form a horizontal plane. Above these prisms is an achromatic lens, large enough to admit the entire beam of light which, coming from the two slits, is refracted through the prisms. The rays which have passed through the lens are received upon a large equilateral prism of flint glass, which is brought by a gentle movement to a position which gives the minimum of deviation to the mean rays of the spectrum. Leaving the prism, the dispersed rays fall upon a plate of ground-glass, placed perpendicularly to the mean rays of the spectrum. By this disposition, two spectra of equal length are obtained, and touch each other by the borders. When it occurs that the two slits receive rays of equal intensity, then two spectra appear as one; but when one source of light is more powerful than the other, with which it is compared, it must be removed to a certain distance, until the required effect is obtained.

I have lately seen some portraits taken by a Voigtlander lens of five inches aperture. They are truly splendid, in size, vigour, sharpness, and brilliancy: the whites are pure, and the darks are remarkable for the delicate gradations of colour they show. I consider nothing finer, or even so fine as these, has ever been exhibited. The artist is Colonel Komaroff. J. P.

Correspondence.

THE REPORT OF THE COLLODION COMMITTEE.

To the Editor.

Sir,—The business of the annual meeting of the Photographic Society having occupied so much time and attention last evening, I conceived that it would be desirable, looking at the importance of the subject, to adjourn both the reception and the consideration of the Report of the Collodion Committee, and I moved this adjournment accordingly.

Perhaps you will now allow me to explain, for the information of those who were not present, that in adopting the arrangement that was come to, by which the Report is to be published in the Journal of the 15th inst., and the discussion upon it adjourned to the March ordinary meeting, it was thoroughly understood that this publication is made in strict accordance with the following rule of the society, viz.—"That in printing papers presented at the ordinary meetings, the Council does not thereby adopt the views or opinions of the authors."—I am, yours, &c.

43, *Piccadilly, February* 8, 1860. VERNON HEATH.

HOW TO ECONOMISE OLD TONING BATHS.

To the Editor.

Sir,—I was lately requested to examine a product obtained from alkaline chloride of gold toning baths, and as the result of the analysis may be useful to some of your readers, I have much pleasure in placing it at your disposal. My friend had been advised to collect his waste solutions, and to throw down the gold from them by sulphate of iron. He did so, and obtained a bulky deposit, which was washed and dried in the usual way. Before sending it to the refiner he enclosed two drachms of the dry powder in a letter to me, asking my opinion of its value. I send you by this post a brilliant little button of pure gold extracted from the powder, which you will find, on dropping it into the scales, to weigh nearly ten grains and three quarters.

In addition to the gold a small quantity of chloride of silver was present, but the great mass of the powder consisted of carbonate and peroxide of iron. The analysis was rendered more troublesome by this large excess of iron, and it at once occurred to me that my friend must have had a very bulky precipitate to deal with in the first instance, and that I might save him some trouble by giving a few directions. It is the carbonate of soda contained in the toning bath which throws down so large a quantity of the iron salt, and this may be entirely prevented by converting the carbonate into chloride of sodium by the addition of hydrochloric acid. Every drachm of the dry sesqui-carbonate of soda will require about a fluid drachm and a-half of the commercial hydrochloric acid, after which the re-action to test paper will be decidedly acid, and sulphate of iron added in excess will precipitate nothing excepting pure gold.

The above method, in which the carbonate of soda is neutralised, although correct in theory, is not to be recommended to the amateur photographer, inasmuch as the deposit of gold is apt to adhere to the sides of the bottle; and not only so, but it appears so small in quantity that an inexperienced person might easily be led to throw it down the sink as worthless.

By making the proper calculation you find that chloride of gold requires nearly six times its weight of sulphate of iron for its reduction, supposing no alkali to be present; but if this quantity be added to the alkaline toning bath, the deposit is so abundant that it seems at first to fill the whole of the bottle. I have, therefore, made a series of experiments to determine the smallest possible quantity of sulphate which may be used.

If to a solution of one grain of chloride of gold, with thirty grains of carbonate of soda, in six ounces of water, there be added a single grain of sulphate of iron dissolved in a drachm of water, the supernatant liquid will be found after vigorous stirring to contain gold still unreduced. A second drachm of the sulphate of iron solution leaves only a trace of gold, scarcely weighable, whilst a third drachm (making three grains of sulphate of iron in all) completes the reduction.

The precipitate as thus obtained is small in quantity, and subsides without any difficulty: after settling down for twelve hours it occupies not more than one-twentieth part of the total bulk of the liquid, and when dried weighs about two grains.

I am, yours, &c., F. HARDWICH.

SPOTS IN NEGATIVES, &c.

To the Editor.

Sir,—Last summer, when practising the wet collodion process for negatives (being quite a novice in the art), I began by giving too long an exposure, but the plate had just the appearance of being *under* exposed, with numerous opaque spots all over it, so I went on adding to the time till I counted forty, and the longer I exposed the more the appearance of *under* exposure increased, merely the highest lights showing, the shadows black without any detail. At last a friend set me right by telling me to count three, which I did, and although that was rather too long, I got a passable picture the first time, with every detail perfect. I still find a difficulty in getting a portrait without those small opaque spots.

If, sir, you can inform me of the cause of the above, or whether in certain states of the bath, collodion, or developer, such appearances are usual, I shall esteem it a great favour.—I am, yours, &c.

Salisbury, January 30, 1860. AN AMATEUR.

P.S.—Seeing some time back, in the pages of a contemporary, an ingenious but complicated contrivance for storing prepared plates or negatives in the plate box without scratching the film, the idea occurred to me, that if the grooves, instead of being made square, were bevelled, it would answer every purpose and be quite as easily constructed as the old plan.

[We cannot explain the first portion of your letter, and have never found over exposure to produce clean shadows without any detail, but rather the contrary.

The plan for grooves which you suggest has been long in use.

As for the spots, we advise you to clean out your slide very carefully, and see that the French polish does not scrape when the door is raised.—Ed.]

PREPARATION OF OXIDE OF SILVER.

To the Editor.

Sir,—Will you oblige me by stating in your next number of The British Journal of Photography how to prepare oxide of silver for the purpose of correcting an acid negative of silver bath? I find it very good for that purpose, and as it is better freshly made, I should like to make it myself.

I thank you for former favours, and am, yours, &c.

J. G. S.

[Dissolve a drachm of nitrate of silver in four ounces of distilled water, and drop into it a solution of caustic potash, made by dissolving any quantity of that substance in eight times its weight of water, more or less. Continue the addition of the potash, with continual stirring, until an olive brown substance settles down, and the milky liquid above gives no further deposit on the addition of more potash. Then fill the vessel up with water, and when the powder has subsided pour the liquid off and fill up again. Do this three times, when the oxide will be sufficiently pure for your purpose.—Ed.]

"P. L."—INDEX.

To the Editor.

Sir,—In your number for November 15th, 1859, on page 282, is Mr. Heywood's paper on "Toning Positive Prints." In the formula No. 2, he says "chloride of sodium (P. L. strength):" will you be so kind as to say what "P. L." means?

While I have pen in hand I take the liberty of suggesting that your "Contents" would be much more useful if they gave the *principal subjects* discussed at the various meetings, as well as the page on which they are reported—especially when any formulæ are given, or *practical experience;* as, for instance, in January 1st number, page 13, is given the method of "transferring to leather." This increased usefulness would be even more apparent in looking over back numbers or volumes.

I am, yours, &c., F. B.

January 27, 1860.

["P. L." means the London Pharmacopæia. The material indicated is, however, not chloride of sodium, but chloride of soda, a preparation analogous to that of chloride of lime.

We fear that to give such an index as you propose would be impossible, and it would certainly be very bulky.—Ed.]

BAUMÉ'S SCALE.

To the Editor.

Sir,—You would much oblige by enlightening me, in your next issue of The British Journal of Photography, upon the following points:—What is meant by rectified ether 62°, rectified alcohol 40°, and "azotic cotton?"—I am, yours, &c. R. PEERS.

[Azotic cotton is nothing more or less than pyroxyline—*id est,* cotton with a portion of "azote" or nitrogen in its composition.

As regards the strength of the spirits, we rather think that the degrees refer to Baumé's scale. If so, the ether would be of specific gravity ·734 and the alcohol of ·830.—Ed.]

A QUIET QUIZ.

To the Editor.

Sir,—I have been somewhat puzzled by a paper on a new dry process, which appears in the last number of your usually very correct Journal. It seems to have been read at the last meeting of the Photographic Society in "Auld Reekie," and, if you report it correctly—as no doubt you do, after what you had to say on this subject very recently—I can fancy the amount of useful information those members present at the meeting must have carried away with them, after giving their attention to so very concise a paper. Dr. Paterson, of Leith, who claims the honour of introducing this valuable new dry process, goes on to say, that "it is his distinct conviction that no collodion film will give anything but uncertain results without some preservative solution;" but I have sought in vain for a hint of the valuable decoction which the Doctor finds so satisfactory and uniformly successful. He lays much stress on a certain kind and thickness of collodion, and we are told that this collodion consists of sulphuric ether and alcohol, with a mixture of the iodides of cadmium and potassium, and bromide of cadmium—nothing more. Pyroxyline has nothing whatever to do with it. The plate must remain a certain time in a bath of certain strength—*to wit:* Silver 40 grains, *acetic acid* 20 *grains, water* 1 *ounce*—truly this will be sour enough to "*mak' the dogs yowle;*" and the given quantity of water with which the plates are to be washed is left ungiven; so that one does not much wonder at the Doctor being named as one of the Society's committee who are to examine and report on this and other dry processes, giving the preference, of course, to the *Doctor's own.*—I am yours, &c.

Edinburgh, Jan. 26, 1860. *VERY DRY.*

[See our reporter's correction in the present number.—Ed.]

ANSWERS TO CORRESPONDENTS.

T. D. B.—Chloride of ammonium.

Park Lane.—Take No 3 on your list.

France.—We must decline to accede to your request.

J. H.—The same developing solution will do.

W. R.—We cannot advise. You must judge for yourself.

Fairfax, Jun.—See our last number of the past year.

O. O.—Your process is not at all new.

R. S. T.—Consult Hardwich's Photographic Chemistry.

J Morris.—A bellows camera is the most convenient.

XX—Refer to the Index of last year's volume.

Argus.—Your suggestion shall be attended to in our next.

Nemo.—Your inquiry is answered in No. 110.

C. B.—*Nil desperandum.* Try again: you have been too hasty.

Exton R.—A metal camera would doubtless meet your requirements.

James Curland.—Your negative has not been sufficiently developed.

C. J.—Harvey's portfolio is just the thing for you. (See our advertising columns.)

George.—The alcohol causes the developing solution to flow freely over the plate.

Quidnunc.—At the Exhibition of the Photographic Society of Scotland, now open.

Operator.—Received too late for insertion in this number, but shall appear in our next.

Otto.—It was a typographical error, but so palpable that we did not deem it worth correcting.

A Perplexed One.—You had better make a new bath, or add half new to half of the old.

Alex.—Read the articles on Fixing Positives, by Messrs. Davanne and Girard in current numbers of this Journal.

Samson.—Your proceedings come under Lord Campbell's Act against obscene publications. You had better retire from that business.

Chas. Cave.—We never made any such assertion, for we never heard before of the maker you name. It is a pure fabrication.

Evening.—Develop with iron solution, and strengthen (subsequent to fixing) with pyrogallic and citric acids.

Cadmium.—We prefer iodide of this base for collodion for amateurs as a rule, though it certainly causes it to be a little more gelatinous than with an alkaline iodide.

Φωτο.—1, We think that you might obtain the material you require by applying to any of the operative chemists who advertise in this Journal. 2. Nitrate of silver is extremely soluble in water: sulphate of silver and acetate of silver both sparingly so. Lactate of silver and fluoride of silver are also soluble.

J L. F.—1. We do not know anything of the maker you name, but the cameras you inquire about are made by Ottewill & Co.—we need scarcely add, well made. 2. Much depends upon the lens employed; if thoroughly adapted for the purpose, there is no doubt that you may do what you inquire about. That which will do well for portraits will do better for your purpose.

F. Watts.—We not only *think* it possible for a Photographic Society where the subscriptions are small to afford to each member a good photograph annually, but *know* that it can be done—*e.g.*: the North London Photographic Association has accomplished this every year during its existence. (See report in our present number.)

C. A. G.—1. It must depend partly upon your object. If for landscapes only, we should employ the collodio-albumen process; but if figures are desired, we fear this would not be satisfactory. Smartt's tent, to be had of Murray and Heath; Burfield and Rouch's tent or box; Shepherd's tent and camera, are all good. Apply to each for an illustrated description, and choose which you find best suited to your requirements. 2. We believe not, especially if Taupenot's process be adopted. 3. Melhuish's metal one.

Simple Simon.—1. See reply to "C. A. G." 2. The fixing of the plates may be deferred until you return home, if you take the precaution of dipping a brush in some quickly drying varnish, and running it round the edges, before wetting the film a second time with water. This will prevent the collodion from splitting or curling off. 3. Perhaps you could not do better than commence your practice with the Fothergill dry process, on plates of the stereoscopic size. 4. We advise you to make the camera slide of well-dried mahogany; but the body of the instrument may be of deal, if you study economy. 5 Hardwich's "Photographic Chemistry," 5th edition. John Churchill, New Burlington Street.

*** We regret to be obliged to postpone till our next number the Second Notice of Mr. Frith's splendid work, "Egypt and Palestine;" also Mr. Hughes's paper *On Toning with Alkaline Chloride of Gold*, and the conclusion of the article *On Fixing Positive Proofs.* By MM. Davanne and Girard.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 113, Vol. VII.—MARCH 1, 1860.

In another column we publish a letter from an "Overworked Operator," appealing to those who have the power, urging them to grant the boon of a weekly half-holiday to the unfortunates who are compelled to spend the bulk of their time in a dark room, inhaling the deleterious fumes there so abundant, but from whom, nevertheless, artistic skill is required.

In a precarious climate like our own it may seem no small thing to ask of a professional photographer that he should give up say one-twelfth of his possible stock of sunshine; but is this so? In the first place, we very much doubt whether there is not, as a rule, one day in the week when sitters are not numerous in the afternoon; but even if we err in this opinion, it would not take long to make the public aware that portraits are not to be had on some particular day. The employer will naturally ask, what he would gain by the concession sought? We think he would gain extra diligence from those he employs during the rest of the week, and in addition superior excellence in their productions. We do not consume the whole produce of our harvest as food: we lay by a portion for seed, wherewith to sow in hopes of a next year's crop. Now this weekly half-holiday, if granted to the operator, will, we consider, be like the corn laid aside for seed, wherewith a rich harvest of artistic skill may be reaped in the following week. Surely some amongst our professional brethren will try the plan for a week or two as an experiment. If it succeed, why of course they will continue the practice; if it fail, they will not have lost much at any rate. But lose they will not. We feel assured that they will at least receive a *quid pro quo*.

It has been suggested to us that very much labour would be saved to energetic workers in the various branches of photography if we were more frequently made acquainted with photographic failures, and that our advance would be thereby rendered both more rapid and more certain. That this would really be the case we cannot doubt, for, by adopting the exhaustive method in any inquiry, we could not fail of success, provided that success were possible. Next to being acquainted with the right road, it is of advantage to know the wrong one, in order that we may avoid it. We know that many, if not most photographers, do not care about recording their failures, but they need not do this by name; and if once convinced of the utility of the practice, we have considerable hopes of its more general adoption. We are very often applied to for advice how to get out of certain photographic difficulties, but it rarely happens that the cases are stated in such a way as to make them available for general instruction. With very little trouble, however, to our correspondents, they might frequently be of great assistance to those younger brethren of the art who are always on the look-out for an available hint. We are informed very constantly that our "Correspondence" is read with the greatest interest, not only by novices, but by "masters in our art." Even they sometimes pick up a hint; but, apart from that, there is the pleasure of "fighting their battles o'er again." We are convinced that our "Correspondence" may be made still more useful than it is even now if our readers will only bear in mind that "one good turn deserves another." In the last number of the *Journal of the Photographic Society* is an excellent article on Actinometry, by Mr. Barnard S. Proctor, yet that article is composed principally of a record of unsuccessful experiments. Truly one man's failure is sometimes better than another's success.

We have noticed upon two or three occasions, some little time back, a circumstance which demonstrates no little want of morality in the perpetrator, and which has excited the attention and animadversion of a transatlantic contemporary. We allude to the appropriation of articles culled from certain photographic journals by an individual, and republished by him as original, and with his name attached to them, in a certain American photographic periodical. But this is not even the whole of the offence, for though complete sentences and even paragraphs are copied *verbatim et literatim*, certain alterations are made which not only frequently destroy the sense altogether, but often, nay, generally, upset the grammatical construction of the remainder, and indicate that the perpetrator of the outrage is as little blessed with education as he is with honesty.

A straw thrown up will indicate the quarter whence the wind blows, and a few chips will mark the course of the current: so matters apparently of little moment are sometimes highly significant. The time was when the accomplished editor of the *Athenæum* occasionally gave insertion to a piece of photographic intelligence, provided it contained something very new, in a patronising way, but quite pooh-poohed the possibility of *art* in connexion with it. Now and then, too, when a photographic exhibition was opened, as a sort of encouragement some notice was taken of it in a "stenographic" kind of manner; but recently we have been not a little gratified at finding that photographers have been favoured with a regular critique or two, much in the same style as is adopted with exhibitions of paintings. We have noticed also that the writer of the said critiques understands more of photography than of yore, though even now he sometimes confuses over-exposure with under-exposure, and evidently is not quite clear which is which. The conclusion that we draw is, that photography is certainly a progressive art.

In a paper recently read before the Photographic Society of Scotland, by Dr. Paterson, he said:—"From a careful microscopic inspection of plates prepared with these two processes, I am satisfied that we shall never get good results, after a short space of time has elapsed, without having a preservative solution to the collodion."

This is an expression of opinion, not a statement of a fact, and therefore open to question—not that we are about to question it, but we cannot help regretting that the Doctor omitted to state

why he came to this conclusion, and what were the appearances which he noticed that led to this conclusion; because, had he so done, others could have argued upon the point, and either confirmed or controverted the opinion as the case may be. We have on many occasions submitted collodion films to microscopical examination, but have been quite unable to detect any appearances sufficiently different between "preserved" and "unpreserved" films that would, in our judgment, lead to such a conclusion.

We are happy to find that our Liverpool friends are about to be regaled with a Photographic Exhibition, in April next, under the auspices of the Liverpool Society of Fine Arts, in connexion with a general Ancient and Modern Art Exhibition. The photographic section of the Historic Society of Lancashire and Cheshire has promised its aid in furthering this object, and our energetic friend, Mr. J. A. Forrest, is taking an active part in the matter. We trust that many of our noted exhibitors, professional and amateur, will aid in making the collection such an one as will fairly represent the present advanced state of the art.

In our last we noticed the omission of the editor's name from the title-page of a contemporary photographic periodical; since then, some of the particulars which led to this proceeding have become public property, having appeared in the law reports of the *Times* and other newspapers. We believe, therefore, that we are not guilty of any impropriety in now stating that the publication to which we made allusion is the *Photographic News*, and the name of the editor Mr. William Crookes, which name has been suppressed. It appears from the "report" mentioned, that a misunderstanding having arisen between the editor and proprietors of the periodical named, in consequence of the alleged unauthorised alteration by the latter of some articles written by the former, the editor "moved for an injunction" before the Master of the Rolls, to restrain the proprietors from making and publishing alterations in his articles, and also from removing his name from the title-page.

It is well known that Mr. Crookes has recently undertaken the editorship of the *Chemical News*, a proceeding which appears to have given offence to the proprietors of its photographic namesake,—and the whole matter was further complicated by an agreement existing between the respective parties concerned extending over a considerable space of time. The judgment of the Court was against granting the injunction prayed for, the *alterations* complained of being similar in character to others permitted on previous occasions, and, in the opinion of the judge, *improvements;* the editor's name was not regarded as a portion of the title as contended; and an action at law was directed to be tried unless the dispute should be settled out of court—the costs to be "costs in the cause." The name of Mr. Crookes has not been replaced; and we have but little doubt, judging from a perusal of the recent numbers, that he has ceased to perform the editorial functions.

PHOTOGRAPHIC CONTRIBUTIONS TO KNOWLEDGE.

"EGYPT AND PALESTINE:"

By Francis Frith—*Illustrated with Photographs.*

[Second Notice.]

Many of the illustrations in this valuable collection we have already noticed in our columns when criticising the contents of the various photographic exhibitions held during the last two years in the metropolis, and where all are so admirable it is a somewhat embarassing task to make a judicious selection for special comment. We do not, however, think we should be doing justice to the excellence of this important publication were we to omit altogether such a proceeding. We shall therefore select for the purpose the following:—

Temple of Koum Ombo, Upper Egypt.—This is one of those gigantic ruins that call forth in the spectator as much astonishment at the magnitude of the structure as admiration at the beauty of design and picturesqueness of effect. The figures of two Nile boatmen leaning against one of the enormous stones which formerly constituted a portion of the freize, indicate the immensity of the proportions of the edifice, which in its turn dwarfs the figures to the aspect of Liliputians. The massive pillars are buried in the shifting sand of the desert almost up to the sculptured capitals, which support an entablature with devices of two winged globes, emblematic of the omnipresence of the deity, and which are plainly visible. Beautiful, majestic, magnificent even in its degradation—what must it not have been in its glory!

Pharaoh's Bed, in the Island of Philœ.—Mr. Frith says: "The Island of Philœ is the most beautiful thing in Egypt, and the temple absurdly called Pharaoh's Bed is the most beautiful thing upon the island." From the very exquisite photograph with which he has enriched this collection we are by no means disposed to question the correctness of this statement. The singular structure of the temple, built without any roof (none being needed in this splendid climate), forms the apex of the composition. Clumps of the date palm trees, with their naked stems and feathery tops, harmonise with the pillars and their leaf-like capitals. At the foot of the mound on which the building is erected, the waters of the Nile appear, with one of the native vessels, called a "dahibieh," moored in a sheltered nook; the whole composing into a most effective picture, albeit one of a very uncommon character. The execution of this specimen is little, if anything, short of perfection.

Sculptured Gateway, Karnac.—This Pylon, as it is termed, consists of a species of triumphal arch—but that no *arch* exists, the opening being rectangular, and the whole structure tapering upwards. Over the gateway is the winged world, before mentioned, while every part of the exterior surface of the building is covered with hieroglyphics.

The Great Column and Smaller Temple, Baalbec.—We instantly recognise these columns as the model or type to which a host of imaginary picturesque ruins owe their existence. That they *are* beautiful, very beautiful, few will be disposed to deny; but *why* they are so it is not so easy to point out. The proportions of the columns and their relative distance apart, perfect as these are at once *felt* to be, are not enough to explain the charm that undoubtedly exists, for this is materially heightened by the terribly dilapidated state of the crumbling stone. Perhaps it may be in some measure owing to the beautiful chequering of light and shade, similar to that we observe in a grove of trees. We are not at all learned in architectural mysteries, but the capitals of the pillars appear to us to be of the kind which we have been taught to call "Corinthian."

We perceive that Mr. Frith indulges in a little *piquante* pleasantry on the subject of architectural nomenclature.

Nazareth from the North-west.—This is an illustration in which everybody is sure to be interested, and is perhaps the most effective of all the distant views. The locality in which Our Saviour spent the greater part of his life on earth is situated in a kind of fertile valley or basin, at a high level amongst a series of rounded undulating hills. Though a little deficient in vigour, this is an extremely pleasing photograph. The immediate foreground is occupied by a hedge of "opuntia," or "prickly pear," a member of the cactus tribe, beyond which Nazareth, with all the peculiarities of an Eastern city, is displayed to view, whilst the background is composed of the wooded slopes of the distant hills, which assume a more and more rugged aspect as the eye ranges over the higher levels; and across the summits of those hills, forming the natural basin on which the city is built, a dim outline of still more distant ridges is perceptible.

The Largest of the Cedars — Mount Lebanon. —Apart from the interest attaching to this subject in an historical point of view, it is one which is valuable as an illustration — not only for botanical puposes, but also to the artist — of the habit and aspect, as well as of the habitat of these celebrated timber trees. The proof before us is beautifully executed, and the composition pleasing and artistic.

The Temple of Wady Kardassy, Nubia, is truly, as Mr. Frith terms it, "a bonnie little ruin." It seems to have been constructed on purpose to form the centre of a picture, as it does in the one before us most completely. Located on the river's bank, with the calm waters of the stream reflecting the wooded slopes of some low hills on the opposite bank, it conveys a perfect sentiment of repose, no doubt partly owing to the deep but transparent shadows caused by the flood of light from an unclouded sun. This is a picture that will please all tastes, possessing as it does a charm apart from association.

The Circular Temple, Baalbec, is an architectural gem; and, what is more, it is disposed in a picturesque setting, situated in a pleasant locality. With reference to a "delicious stream," along the bed of which he rode knee deep in approaching this temple, the artist quotes the following lines :—

"So bright the pebbles on its shore,
That not a maid may thither stray,
But counts her stringed necklace o'er,
And thinks the pearls have slipped away."

Assouan — a town on the banks of the Nile, situated in the most romantic spot of the Nile Valley, in the immediate vicinity of the first cataract and the islands of Elephantine and Philœ — is no less interesting as a landscape. The town is, as it were, imbedded in a luxuriant grove of date palms, and is backed by a low range of distant hills, while the windings of the river form a graceful foreground, prettily broken up by a number of passenger and merchant vessels moored alongside the beach, which is strewn with such merchandise as ivory, bags of gum, and other similar produce, whilst a crowd of natives occupy a point of land near some of the vessels. It is altogether a very pleasing composition.

With so many attractive illustrations, it is difficult to know where to stop; but as we have already extended this notice far beyond our usual limits, with one more we shall conclude it.

The Doum Palm and Ruined Mosque, Philœ, is equally worthy of commendation with the last-named, as a picture; though the subject is perhaps as markedly in contrast with it as it is well possible to be. It is a ruined mosque on the steep side of a rugged, picturesque rock, with the palm tree in the foreground, the fruit of which tree, we are informed, constitutes the nut employed for making small articles of turnery ware, and known as vegetable ivory. We cannot resist the following quotation from the letterpress annexed to this specimen :—

"It may interest my brethren of the Black Art (as my mother calls it when she overhauls my shirts as they come from the wash) to know something about my apparatus and *modus operandi*. Know then, that, for the purpose of making large pictures (20 inches by 16), I had constructed in London a wicker-work carriage on wheels, which was in fact both camera and developing-room, and occasionally *sleeping-room;* so that the doctor whom I heard at the Photographic Society a year or two ago ridiculing the rage for large pictures, and proposing as the *ultima thule* of extravagance which his playful fancy could suggest 'that men should have their cameras upon wheels, and large enough to sleep in' (a remark which raised a hearty laugh through the room), committed an error common with wits — his remark was much less facetious and imaginative than he supposed.

"This carriage of mine, then, being entirely overspread with a loose cover of white sailcloth to protect it from the sun, was a most conspicuous and mysterious-looking vehicle, and excited amongst the Egyptian populace a vast amount of ingenious speculation as to its uses. The idea, however, which seemed the most reasonable, and therefore obtained the most credit, was, that therein, with right laudable and jealous care, I transported from place to place my — harem! It was full of moon-faced beauties, my wives all! — and great was the respect and consideration which this view of the case procured for me!"

We have already mentioned the handsome manner in which this work is "got up." The printing, both typographic and photographic, is of the highest order. As regards the former, it is of a most readable size, clear, and not too crowded, and the initial letter of each page is elaborately ornamental; respecting the latter we can truly affirm that it is about as near to perfection as possible. The whole of the proofs have been executed in the establishment of Messrs. Frith and Hayward, under their personal superintendence, and we have reason to know that there is every probability — not to say almost certainty — of the *permanence* of these photographic treasures,—the system pursued in their production embracing all the most approved manipulations, and the colouring matter of the pictures consisting of gold.

Messrs. Frith and Hayward have recently removed their extensive printing establishment to Reigate, where they have erected every appliance for the production, on a large scale, of first-class photographic proofs, for the illustration of this and other important publications, as well as for general photographic printing. We are of course not at liberty to mention the extent of their resources for the production of a large number of copies in a given time; but we may state that it is astounding, and goes further to convince us of the stability of photography as "an institution" than the concurrence even of many other favourable indications.

We cannot conclude without expressing a hearty wish for the commercial success of this publication, of which we have been endeavouring to convey to our readers some adequate idea.

Those who feel inclined to inspect the views can at present do so at Messrs. Leggatt, Hayward, and Leggatt's, in Cornhill, London, where the whole series, mounted and framed, is on view.

REMARKS ON PHOTOGRAPHIC PRINTING AND THE ALKALINE GOLD TONING PROCESS.

By Mr. Hughes.

[Read at the North London Photographic Association, January 25th, 1860.]

It is certainly unnecessary, in introducing the subject of photographic printing, to occupy any time in showing its importance. The more diffused our art becomes, and the more extended and varied in its applications, the greater the necessity that its productions should be as perfect and as permanent as possible. Thanks to the many photographic chemists who have devoted their attention to this subject, foremost among whom is Mr. Hardwich, the theory of photographic printing has made rapid advances; but I am inclined to think that photographers generally have not attached sufficient importance to these investigations, and that, especially in everyday practice, they have not profited to the full extent by the knowledge thus placed before them. Far be it from me to say that any method has yet been given out by which prints may be guaranteed to be permanent; yet many processes have been largely practised, and are not even now abandoned, which in their very nature are calculated to yield only temporary and fading ones. The object of the present paper is to call attention to the different methods of toning and fixing, to advocate strongly what the writer believes to be a superior method of printing, and to show that there is no difficulty in reducing this method to practice; likewise to bear the testimony of nearly two years' experience that it is suitable for all the wants of the practical photographer.

It is but a few years since that a wail of despair arose, when most of the brilliantly toned prints of that time were found to be fast fading. An appeal for help to stop this plague was made to the chemists, who were asked to explain this fading, and to show how to avoid it. Help soon came, and it was proved that the fading was caused by the sulphur compounds generated by the use of old acid hypo in the toning and so-called fixing baths. The cause once known, many plans were suggested to remedy the evil, and from that time the prints improved. But the question now arises: Have we sufficiently profited by our past experience? Do we, in our daily practice, take advantage of all the knowledge that has been placed within our reach? Though every intelligent photographer affects the greatest horror of toning by sulphuration, and few will be found to advocate the old method of forming a toning bath by adding blackened chloride of silver and free acid to hypo and gold, yet in what respect does the common practice differ from

this, when commercial chloride of gold (always containing free acid) is added to hypo, and the prints taken direct from the pressure frame and immersed therein? Nitrate of silver added to hyposulphite of soda invariably produces decomposition, liberates sulphurous acid, precipitates sulphur, and produces all the conditions necessary for sulphuretting action. Let not the photographer then hide the fact from his mind, that by immersing his unwashed prints in the solution of hypo and gold he is producing, whether he intend it or not, a toning bath by sulphuration. Whether nitrate of silver be added to the bath concealed among the pores of the paper, or visibly in the form of crystals, the result must be the same.

But here allow me to hold an imaginary conversation with a photographic friend, who interrupts me by saying—"Yes! but when I put my unwashed prints into my toning bath I get good colours." "Admitted," I reply; "but mainly, if not entirely, due to sulphur." "But," says he, "I added gold to my bath, one grain to the ounce." "Exactly; and this by its acidity assists in producing the sulphuration." "But," exclaims my friend, "what am I to do then—wash my prints first?" "Yes." "But in such a case they tone so slowly—how is that?" "Because you are trying to tone by the action of gold alone and without sulphuration." "Why cannot I succeed? Everybody talks about toning by gold." "Because you have hypo present, which retards the action of the gold; moreover, you are mixing up two distinctly different processes—toning and fixing." "How should I do then?" "*Use the gold without the hypo for the toning, and the hypo without the gold for the fixing;* in short, don't mix up two processes which are by their nature dissimilar." "Tell me how you would proceed." "Listen;" and here my paper properly begins, but from the above you may infer that I am no advocate of the gold and hypo toning. I consider it to be theoretically imperfect and practically delusive; while I esteem the other, or alkaline gold toning process, as theoretically correct, and as practically the nearest approach to a perfect printing process. My assistants and I have practised it nearly two years upon all varieties of prints, large landscapes, small stereoscopics, portraits large and small, on the most highly albumenised and on plain paper. I find it capable of giving all desirable varieties of tone—warm chestnut brown, purple brown, or purple black.

In many of my friends' hands it produces equally good results. Moreover, I have found it so easy, certain, and regular, that had I not heard of others experiencing difficulties in working it, I should scarcely have felt warranted in introducing it to you. I am, however, so impressed with its superiority, and so anxious that it should be generally practised, that I crave your indulgence if I appear unnecessarily minute in the particulars. The choice of the paper is important—more so in this than in the usual printing process. It is only necessary, however, to have a clean, well albumenised paper, with a fine hard face, that will retain the albumen on the surface rather than in the pores. A paper that presents a dull woolly look will seldom give anything but a flat, dead picture. The paper itself, apart from the albumen, in this as well as in other printing processes, undoubtedly modifies the tone and general aspect of the finished picture. Saxe and Rive papers have given me the most brilliant pictures: of the two I prefer the former, since it is the most free from metal spots, and being rather larger, cuts up more advantageously. The amount of glaze on the surface may be varied with the taste of the operator, but the finest prints are certainly to be obtained on the highest albumenised paper; in fact, there is no process so well adapted to give rich tones on the very highest glazed paper as the one now described, since the extra amount of albumen, though offering no obstacle to the toning, materially assists in giving a fine rich colour. To those who albumenise their own papers I may mention, in passing, that the more concentrated their albumen the smaller the proportion of salt they will need, and where albumen alone is employed, from five to eight grains per ounce of chloride of sodium or ammonium will be enough; but since most persons purchase their paper already prepared they will be spared this consideration.

To sensitise the paper, float it for about four minutes on the silver solution, dry quickly, and use as soon afterwards as convenient. I attach great importance to keeping the silver sensitising bath in good order. I make it about sixty grains to the ounce; I test it, and if it be acid I neutralise by carbonate of soda, and add one drop of glacial acetic acid per ounce. This keeps the whites of the print clear, and prevents the solution acting on the surface of the albumen. If more acid than this be present, or even as much of nitric acid, great difficulty will be experienced in toning. This fact I have established frequently—that a strongly acid silver bath greatly impedes, if it does not entirely prevent, the deposition of the gold in this process. I believe it also to be of the greatest consequence to keep the silver solution up to the required strength, for if the solution be weak the prints will be poor and flat. Few persons are aware, unless they have tried it, how rapidly sheets of paper rob the solution of its silver. To prevent mistakes on this point, I recommend in every printing establishment, and to all amateurs, the use of the silver-bath meter. This little instrument, made on the principle of the hydrometer, has only to be immersed in the sensitising solution, and the number of grains per ounce it contains will show at the line where the surface of the fluid touches the tube. The merit of this little instrument is its simplicity. Without professing analytical accuracy, or the perfection of more complicated instruments, it is sufficiently correct for all practical purposes, and no knowledge of chemistry is required for its use. It is always ready, needs no calculation, and the dullest boy can employ it. The general plan adopted, of throwing in a few crystals after some sheets have been sensitised, just as the operator may fancy, can lead only to the most irregular practice; for he is at one time working with a needlessly strong solution, and at another getting weak and dim prints, blaming, perhaps, the paper, when the fault lies in the weak solution.

I had a pupil once, who sent to me, from the country, for some albumenised paper. He took a few prints, and all went well. But after a time he wrote to say that the last few sheets of the paper were not so good as the first, and that he wished for some more like the first sheets, assuring me that there was a difference. The same paper was sent again, but the reply came, "very bad indeed—worse than before." As I knew the paper to be first-rate, daily using it, I asked to see the faults; and when the dim, weak, and mottled prints came, I surmised the cause. I sent a bath-metre, and invited my correspondent to try his sensitising solution: he did so, and found that it stood at twenty grains per ounce. He had been using strongly albumenised paper on a solution of twenty grains, allowing it to remain on two or three minutes, and was astonished that he did not get bold and clear pictures. He strengthened his solution to sixty grains per ounce, and then the paper he had condemned was found to be all he desired. Although this is an extreme case, yet many may be daily troubled in a lesser degree from the same cause.

It will not be possible to continue using the silver solution without its turning dark coloured. The remedy is the use of kaolin. If two or three ounces of this substance be shaken up in a bottle with the discoloured solution, and allowed a few hours to settle, it will be found to be its proper colour again. I keep a few ounces of kaolin at the bottom of my stock bottle, and at night the solution that has become discoloured by use during the day is poured back and well shaken up with the kaolin, and in the morning I find it decolorised, settled, and ready for use again. It is then tried by the silver metre, and fresh crystals of nitrate of silver are added in the proportion required to bring the solution to the standard of sixty. Thus the solution is always kept in a uniform condition.

Newly precipitated chloride of silver has a similar property of decolorising the silver bath. A few drops of a solution of clean household salt, therefore, added to the bath, and the curdy precipitate well shaken up, does the same work as the kaolin. I have used both these methods, but prefer the kaolin, as being more economical and effective; still there are circumstances, such as when kaolin cannot be obtained, where chloride of silver will be very useful.

According to the ultimate tone desired, so should the print be exposed. If a warm tone be wanted, some of the shades of purple brown for instance, then the printing must be carried a little deeper than you would like it to remain; but if a rich purple black is required you must print much deeper, and the deepest shadows should be slightly bronzed. Do not examine the prints much in daylight, or the pure high lights will suffer; keep them in the dark or yellow light till you are ready to tone and fix. My practice is to print during the early and middle parts of the day, placing the prints as they come out of the pressure frames in a drawer secluded from the light. In the latter part of the afternoon I collect my prints, and commence by cutting off all the blackened and bronzed margins, preserving the paper, the silver from which, together with filter papers and other scraps, I afterwards recover by burning. Three dishes are then placed beside each other; the prints are one by one immersed in the first till all have been put in, allowing them to remain, say five minutes, and then placing them in the second dish, moving them about, that the water may get well between them, again leaving about five minutes, afterwards removing them into the third dish and allowing them to remain a few minutes longer. The object of these several waters is to wash out all the free nitrate of silver from the paper. The last water should be

only *slightly milky;* if it be more than this the prints must be further washed. These waters are then poured into a large vessel, and some solution of household salt added. The nitrate is thus converted into chloride of silver, which precipitates. This is allowed to remain undisturbed till the morning, when the chloride having settled at the bottom the clear water is poured off from the top, and the vessel is ready to be used again for a similar purpose. The chloride thus daily accumulates until it is in quantity sufficient to be worth sending to the refiners for sale. This in the end will be found cheaper than attempting to reconvert it into nitrate of silver oneself. By this means a very considerable amount of the expense of printing may be avoided. After the prints have been well washed some persons recommend that they be immersed in weak salt and water, others suggest dilute ammonia. I have tried both, and can find no advantage in either, and have therefore abandoned them. The prints are now ready for the toning bath, which is composed as follows:—

Chloride of gold	1 grain.
Carbonate of soda	10 grains.
Good household water	8 ounces.

These, unlike the gold and hypo solution, may be mixed in any order. For convenience I always keep my chloride of gold in a solution of known strength, say the usual fifteen grains in fifteen ounces of water: every ounce of solution then contains one grain of chloride of gold. It is advisable to warm this toning bath, as its action is thereby rendered more rapid, especially in winter time; but it must not be made too hot, or the gold will be precipitated. If the solution be heated so that it is just warm to the fingers it will be sufficient. The prints must be put in individually, and be kept constantly moving about. Those put in first will rapidly tone to a purple tint. It is necessary to watch the prints as they arrive at the proper tone, and then remove them into a dish of clean water. Most persons who begin this process tone their prints too much, so that when they are finished they have a faded, cold, bluish look. If they be not toned enough they will be of a brown hue, the happy medium lying between these two extremes. For beginners in this process, I recommend to put not more than ten prints at a time into the toning bath: let them turn these over and watch them, and take each out, and place it in the dish of clean water, as it arrives at the desired tone. When the whole ten are done, then put in another ten, and so on, since when the operator has had more experience he will be able to manage a larger number at a time in the bath. The toning will take from two to five minutes, according to the depth of colour desired and the number of prints in the toning bath at one time. No more toning solution should be mixed than is necessary to be used at the time, as it will not keep. In order to judge of the quantity of solution that should be mixed, I give, as the result of careful and long continued experiments, taking one variety of picture with another, that one grain of chloride of gold used in this manner will tone five hundred square inches. As a whole plate contains about fifty square inches, one grain will tone ten prints of that size, or twenty-five stereoscopics.

By keeping the chloride of gold in solution, and taking advantage of the above rule, a person may easily calculate how much toning solution he requires.

The prints removed from the toning bath to the dish of clean water, are now placed in the fixing bath, formed of

Hyposulphite of soda	1 ounce.
Water	7 ounces.

Allow them to remain in ten minutes or a quarter of an hour, frequently moving them about. Wash them well in the careful manner that is usually recommended (and most persons have some pet plan of their own); but they should have many changes of water during the first hour, and one at least for every hour afterwards. When the prints are placed in the hypo they usually lose some of the purple hue; but, if they are properly toned, this rich colour will return to them on drying. The above quantity of hypo solution will last for two or three moderate batches of prints, when a new one may be made, or fresh crystals be added to the old one. If this latter plan be adopted—and it is a very general one—a little prepared chalk or carbonate of soda should be added to the fixing solution, so as to keep it faintly alkaline; it thereby loses the sulphuretting action it might probably acquire by continued use. The process I have thus minutely described I strongly recommend to photographers as being the best that exists. My assistants and I have produced some thousands of prints with it. I have a heap of them here, done more than twelve months since, from which you can judge of the varieties of tone. These prints have lain loosely in a drawer; and although the time that has elapsed is nothing in proving their stability, yet it is satisfactory to think that so far there is no indication of change.

Theoretically this process is the most perfect we yet have, and brings this part of our art more within the reach of definite principles; for we have fewer of those mysterious and complicated chemical actions, and each portion of the operation is separate and distinct from the rest. The print is taken from the pressure frame, and, the nitrate of silver it contains having served its purpose, is first washed out. Gold is then deposited on the reduced silver, improving the colour and, judging from reason and analogy, aiding the stability of the print; next, the chloride of silver still remaining in the paper is dissolved out by the hyposulphite of soda; and, finally, with careful and copious washings the hyposulphite is sought to be got rid of. Every stage is clear, simple, and easily understood.

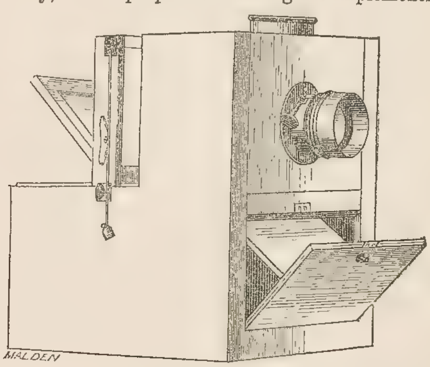
Practically it is the best, because it is more economical in time and money, gives the richest tones, allows considerable variety, and, greatest of all, affords a hope that with ordinary care its results will be as permanent as they are beautiful.

PHOTOGRAPHIC DEVELOPING LABORATORY.

By Titus Albites.

[Communicated to the French Photographic Society.]

The object of this apparatus is to enable unskilled operators to execute the collodion process in the open air, without the aid of tent or dark room, and in a manner so easy as to be almost mechanical. The apparatus consists of a camera [see cut], the lateral sides of which are prolonged so as to form a box of dimensions double those usually given to cameras. The upper half consists of the usual working parts of a camera; the lower portion forms the laboratory. The back portion of the camera, which serves as a frame, contains a fixed gutta percha dish and the nitrate of silver bath, which is concealed in the laboratory. This bath, as may be understood, moves with the frame, and is drawn up with it when slid. A cord, which is seen at the side of the camera, held in position by a counterpoise, sustains, in the middle of the frame, a piece of silver intended subsequently to hold the collodioned plate. In front, beneath the lens, a door opens which admits the hand into the laboratory, for the purpose of working the implements, &c.



To employ this apparatus, proceed in the following manner:—The door beneath the lens being closed, lower the shutter of the frame, and focus upon the ground-glass in the usual manner. Remove the focussing glass, and substitute the collodion plate, which is kept in its place by the piece of silver fixed to the upper part of the frame. By detaching the cord, placed on the outside, which sustains this piece of silver, the glass is allowed to fall by its own weight into the silver bath beneath, as before explained. Raise it, then immerse again and again, until it is completely sensitised. About twenty to twenty-five immersions are necessary and sufficient for this purpose. The plate being now sensitised and restored to its proper position, the cap is removed from the lens, and the necessary exposure given. Then replace the cap on the lens, and cover the plate with an india rubber cloth; detach the silver hook that sustains it, then seizing it by the extremities, incline it, and make it pass into the developing bath placed at a certain inclination within the laboratory. The sides of this bath are formed of yellow glass, and receive the plate in a groove, which prevents it touching the sides. Then open the door beneath the objective, when the screen falls upon the developing bath, which contains the plate, so as to prevent the light injuring it. The bath, which is composed of yellow glass, is then lifted out of the laboratory, and

its arrangement admits of the developing being proceeded with in the open air, the operator watching it through the coloured glass.

Among the principal advantages the inventor claims for his apparatus, M. Albites especially urges that of suppressing the usual slides, and consequently less risk of spots and stains appearing; also that the sensitised plate is acted upon immediately it leaves the silver bath, and consequently diminishes the time of exposure.

ON VARIOUS KINDS OF GLASS, WITH REFERENCE TO THEIR APPLICATION TO PHOTOGRAPHIC PURPOSES.

By J. A. Forrest.

[Read at a meeting of the Liverpool Photographic Club, February 14, 1860.]

The most important use of glass in photography is, undoubtedly, for the sensitive tablet; therefore, to have a clear apprehension of its nature and qualities, it will be necessary for me to describe the process of its manufacture. I will not enter upon its component parts until I treat the subject with reference to its use for photographic roofs. There are only two kinds of manufacture, viz., crown and sheet: both come under the head of blown glass, but the processes are essentially different. In "crown" the glass is wrought into a flat circular table, with a "bull's eye" in the centre; and in "sheet" into a hollow cylinder, which is cut in the direction of its axis, and then unrolled into a flat rectangular "sheet," of uniform thickness. Both kinds of glass are frequently made from the same furnace of "glass;" but as crown glass has been made for a longer period, I will first describe its manufacture, and then proceed to sheet glass.

The first workman is called the "gatherer." It is his duty to take up or "gather," upon the end of an iron blowpipe, sufficient "glass" to form a table of the size and weight required, the average diameter being fifty-two inches, and the weight thirteen or fourteen pounds. The blowpipe is about six feet long, and one-and-a-quarter inch diameter in the body, with half-inch bore from end to end. The mouthpiece is turned of a convenient shape, and a handle is formed adjoining it, by wrapping cord upon the pipe until the diameter is increased to about two inches: it is then covered with a thin layer of cement. The "glass" is "gathered" upon the extremity, "the nose"—the pipe for about four inches being expanded gradually like a cone. The "nose" is heated by an attendant boy, who hands the pipe to the "gatherer;" he walks up to the furnace, and through a hole in the side—the "working hole"—he dips the "nose" of the pipe into the "glass" in the "pot," and by turning the pipe round "gathers" a quantity of "glass" upon it. The weight that can be "gathered" depends greatly upon the state of the "glass" as to fluidity: the stiffer and cooler it is, the greater the quantity that can be taken up at once. At the commencement, when the furnace is very hot, three successive gatherings are generally necessary to obtain enough "glass" for a "table;" but as the furnace soon cools, the majority are "gathered" at twice. Of course, before "gathering" a second time, the "first time" is allowed to stiffen and cool. A great deal of skill is required in the "gatherer" to keep his "gatherings" concentric with the pipe, and of a regular shape, and to gather his second and third times at proper intervals. If the "glass" were, so to speak, lopsided, the air bubble would not pierce it in the centre, and the table of glass would be untrue in shape, or thicker on one side than the other: so also irregularity in the shape of the "gathering" would cause irregularity in the size and thickness of the "table." These faults are avoided by a constant and careful rotation of the pipe upon its axis, the tendency of the semifluid mass to bend downward being continually counteracted by the turning, which obliges it to bend itself straight again, and this motion of the pipe is continued incessantly, in various degrees of speed, from the instant the pipe is dipped into the "glass" until the "table" is delivered complete to the kilnman for annealing. During the "gathering" the pipe has become heated from the "glass;" it is, therefore, cooled by a stream of water, and the workman then proceeds to the gatherer's "marver." This implement was originally called a "marbre" (a flat slab of marble being employed); it now consists of a plate of polished cast iron, elevated about twelve inches from the ground. He rolls the "piece" to and fro on the polished "marver," bringing the front to an obtuse angle; the pipe is then lowered considerably, and the hinder part of the piece is rolled or "marvered" in the same manner as the front. The form thus obtained is one which experience has shown to be the best suited to the acquisition of a circular plate or "table" of as equal thickness as possible. The point ultimately forms the "bull's eye" or "bullion."

The shape being perfected, and the glass of a proper consistence, a boy blows forcibly down the pipe, and the "piece" assumes the shape of a spear head, having a hollow in the centre, and is carried by the boy from the "gatherer" to the "blower." The small air bubble, left for the purpose of keeping open the bore of the pipe, or the contraction of the iron, would so fasten the "glass" in the aperture that no human lungs would have power to force a passage. From very obvious reasons it follows that the larger the opening or bubble containing air, the easier is the blowing, hence the very small bubble for the "marver boy" to commence upon, and the stiffness of the glass renders his blowing the hardest in the whole process, and he is obliged to hold in his cheeks with his hands, or the muscles would become so fatigued he could not blow at all. This post is taken in turn, for short periods. The "piece" having passed into the hands of the "blower," he reheats it through an aperture in a small reverberatory furnace, called the "Patteson hole:" the derivation of this name is unknown to me. As soon as sufficiently heated, the man carries the piece to the "blower's marver," similar in every way to the gatherer's marver, and having hung the "piece" downwards in the passage, it elongates. The point is straightened upon the marver, and then resting the pipe upon the edge of it, the "piece" projecting beyond, he rolls it to and fro, gently and gradually blows down the pipe, and swells the "piece" to the form of a large pear; the point now taking much more the "bullion" shape. It must be borne in mind that the hottest, and, consequently, the softest portions of the "piece" expand most when blown out, and that the thickest portions keep hot the longest, and in reheating the thinnest parts are soonest heated. It can thus be conceived, how by waiting until it is somewhat cooled, or by blowing most at first—how by hanging down and drawing out, or keeping up and running in—and how by clever management of the rotation of the pipe, centrifugal force may or may not be called into play—I say it can be conceived how, by these and similar means, an adroit workman regulates the thickness of various parts of of his "piece."

[We regret being obliged to postpone the remainder of this paper, and accompanying diagrams, till our next Number.]

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the above society was held on Friday, the 17th ult., in the Lecture Hall, Walworth; the Rev. F. F. Statham, B.A., F.G.S., President of the Society, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Wall, Hon. Sec., said he would tender no apology for calling the attention of any members not cognisant of the same, to the fact of Mr. Lake Price being upon the eve of publishing a series of papers upon *Composition and Chiaroscuro in their Application to Photography.* Photographers had yet to learn the real value of their beautiful art, apart from its purely scientific elements; and he hoped the articles in question would do much to elevate and refine photographers, and (through them) photography. While on the subject, he might perhaps be permitted to add a few words upon some articles appearing weekly in one of the journals, under the heading of "Backgrounds: how to paint and arrange them." Certainly nothing could have a greater tendency to lower photography to a "penny plain and twopence coloured" species of art, than these papers—written, beyond doubt, by one who in theatrical parlance is called "the stage property man"—degrading the character of the periodical in which they appear, and offending all readers possessing the smallest quantity of good taste. Having an especial abomination of "white skies," will you also permit me to call attention to a letter in this day's *Photographic Journal* from Mr. Collie, in which he states that he secures natural clouds in his pictures by first developing until the sky is out, then washing, and again re-developing the parts not sufficiently done. To restrict the solution to one particular part seems to require no little skill and care, but it is a hint worth notice.

The discussion upon a paper read at the previous meeting by Mr. Leake, jun., was then resumed. [See page 34.]

Mr. Hannaford asked if the gentlemen who undertook to provide specimens in illustration of their remarks at the last meeting had done so?

The gentlemen in question not having brought such specimens,

Mr. Herve said Mr. Leake's experience tallied so closely with his own, that he should merely refer to the absence of one common cause of failure in that gentleman's list, viz., that arising from immersing the plate too quickly in the bath.

Mr. Hannaford: A question was raised at the last meeting as to whether anything would be gained in the time of exposure if the picture were first brought out by iron, and afterwards intensified by pyrogallic acid. From some experiments he had made, he was inclined to believe that the advantage in this respect was not so great as was generally supposed.

Mr. Hughes, being present, would perhaps favour the meeting with the result of his experience on this subject.

Mr. Hughes regretted his absence at the reading of Mr. Leake's paper, and said, with regard to the question of development with iron and pyrogallic acid, that his own experience was somewhat involved, inasmuch as he was not prepared to say in unqualified terms whether, under all circumstances, much was gained in the time of exposure by the use of the iron developer. Developers varied greatly with the nature of the collodion used. Bromide in the collodion and pyrogallic acid as the developer necessitated a long exposure. Archer's collodion, iodised with four grains of iodide of potassium to the ounce, produced, when newly iodised, equal results with both the iron and pyro. developer; but when it began to lose its sensitiveness, and became, say a deep sherry colour, the iron certainly proved the better developer, giving details in the shadows, when the pyro. failed to render such detail altogether. Take any collodion and bromidise it, and a remarkable change will be produced. The iron will then bring out the picture with excellent half-tone very quickly with a short exposure, which must, however, be materially increased if pyrogallic acid be used as the developer.

Mr. Hannaford, to test this matter, exposed a plate with collodion containing a maximum of bromide, and afterwards developed the two halves of the picture separately, the one half with iron, the other with pyrogallic, and found, by so doing, that while he gained nothing in the details of the shadows by using the iron in preference to pyrogallic, yet it gave a cleaner picture, and brought it out under retarding circumstances of temperature. Mr. Hannaford promised to make a series of experiments in this direction, and bring down the results to the next meeting, as a continuation of the "Photographic Jottings."

Mr. Tear had tried the experiment Mr. Hannaford named, and got excellent detail with the iron, while the pyrogallic gave nothing but a bad positive. It was true that he had not tried them on the same plate, but the exposure had been the same. As he had purchased the collodion (negative) he could not, of course, speak as to its nature.

Mr. Leake thought, with Mr. Hughes, that the time of exposure was determined as much by the nature of the collodion as that of the developer, and spoke of an instance in which he found the ordinary pyrogallic developer acted with greater rapidity than the iron. But for portraiture, at least, he held iron to be far preferable, as giving cleaner, clearer, and more uniform results.

Mr. Howard had found during the late unfavourable season, that it was only by using iron that he could procure a picture at all, and that by its use he could procure one with half the exposure needed for the pyrogallic developer. He used Thomas's collodion. Mr. Leake had referred to the development of dry plates with iron, and he had certainly found it very useful. As an amateur, with but little time for experiments, he should be glad to know of a test for the bath more certain and definite in its results than litmus paper was stated to be in Mr. Leake's useful paper.

Mr. Hannaford thought the test paper sufficiently sensitive for all ordinary purposes, but not, of course, for baths where instantaneous pictures were required, and gave the following plan:—A bath for ordinary work should contain acid in sufficient quantity to render its effect on test paper readily perceived. If, however, it were desired to obtain a bath as nearly neutral as possible, the best way would be that recommended by Mr. Leake; but the plate need not be exposed in the camera, it would be sufficient to stop when the plate no longer threw down a deposit of silver.

Mr. Hughes suggested a slight modification of Mr. Hannaford's plan, and explained that, as there was always more or less tendency to reduction if you sensitise a plate and admit light to any portion of its surface, the effect would be confined to that point, and would prevent the irregular reduction which might tend to mislead as to the state of the bath: a portion of the plate ought, therefore, to be exposed to light.

Mr. Simpson thought Mr. Hughes's suggestions rather tended to get the bath in good working order than to get a neutral bath, which was the real purpose of the discussion. The process just recommended *might* issue in getting a thoroughly acid bath. After all, the question of neutrality or acidity of the nitrate bath was unimportant, compared with the necessity for having it in good working condition.

Mr. Hughes said he was curious to know why Mr. Leake had lost faith in test-paper.

Mr. Leake had not exactly lost faith in it, but did not think the test-paper would detect a small quantity of acid so quickly as the plan he recommended in the paper under discussion, viz., rendering the bath slightly alkaline, then acidifying it, adding the acid drop by drop, and trying a plate after each addition. A comparatively large amount of acidity was only detected after a long immersion of the litmus paper.

Mr. Martin thought Mr. Leake must have used an inferior paper, and certainly not Clarke's. The solution in which litmus paper is prepared always contains free alkali, a portion of which the paper generally retains. Clarke's paper would certainly detect the presence of acid before fifteen minutes had expired.

Mr. Leake: If the test-papers are not always to be relied upon—for Mr. Martin inferred as much—he thought this was an argument in favour of his assertion rather than the contrary.

Mr. Herve never used test-paper at all, for he did not care to tamper with his bath: he used two collodions of such different natures, that when the one gave fog the other did not.

Mr. Simpson thought this a very good suggestion. Different samples of collodion, kept handy, and judiciously used, were decidedly better than tampering too frequently with the bath.

Mr. Hughes said the plan might be a very good one, if adopted for the merely practical purposes of photography, but it was not calculated to advance one's knowledge of the chemical science. Whether a photographer should study chemistry or not was a question apart; but he thought it would be as well if the operator were in a position to determine the state of his bath at any time.

Mr. Herve still thought there was much danger in tampering with the bath.

Mr. Martin believed that Mr. Hervé's half-and-half process might not always answer.

The discussion here became so conversational and discursive, and some of the remarks were made in a tone so confidentially low, that the Secretary, who was busily taking notes for this report, ventured to call attention to the fact.

The Chairman said that, having a paper still before them, he thought they might now bring this discussion to a close. After some remarks upon the bad policy of deferring discussions, which were seldom so animated when postponed as they promised to be when following immediately upon papers originating them—and pointing out the languid commencement of the present discussion, which had grown so animated at the close—went on to say: "Observation proves that we sadly want a delicate test for alkalis and acids; litmus paper is not sufficiently sensitive, and loses its power greatly if kept long. The making of litmus paper is so simple a thing, that, to ensure care in the manufacture of it, the better plan is to make it yourself, the litmus can be easily obtained, and you have merely to soak bibulous paper in the solution until it assumes a strong purple colour. To render this paper more sensitive, it is a very good plan to turn it pink with acid, and use ammonia or some other alkali to restore the colour." He regretted that none of the promised specimens had been brought forward, but attributed it to the unpropitious nature of the weather.

Mr. Clarke then read his paper *On Recent Improvements in Photographic Apparatus*, and illustrated his remarks by the exhibition of several very meritoriously contrived cameras, &c.; but without these being before the reader the observations would scarcely be comprehended.

Mr. Martin thought a description of a camera he had himself just invented, and which was about to be introduced to the photographic world by Messrs. Horne and Thornthwaite, might aptly enough follow in the wake of Mr. Clarke's paper.

Description of Martin's Universal Portrait, Landscape, and Copying Camera.

An amateur commencing the study of photography with a small lens and camera (say quarter-plate size), no sooner acquires a tolerable degree of proficiency in the art, than he becomes embarrassed by the limited capabilities of his apparatus; he longs for half or whole-plate lenses to enable him to take groups and larger sized figures; and even when supplied with these and a 9 by 7 landscape lens, he not unfrequently wishes to enlarge, reduce, or copy, and finds that even when supplied with four lenses and four cameras, he is not sufficiently well armed to meet all contingencies.

An apparatus, therefore, which, within the limit of 9 in. by 7 in., will admit of the employment of each and all of these lenses for original pictures, and for enlarging and reducing the same, becomes a desideratum, and such an one we would now offer to the notice of Photographers. It consists, primarily, of a base-board, 30 inches long and 11 inches wide, divided into three pieces and hinged together by means of broad brass hinges, so as to diffuse the bearing as much as possible, and bolted together when in use by sliding panels of mahogany, extending across the entire width of the base-board. This base-board being grooved on to its outer edges, allows the sliding portions of the camera to be moved from one end to the other, so as to alter the relation between object, lens, and image *ad infinitum*.

What may be regarded as the body of the camera is of the same construction as an ordinary expanding camera, except that it is furnished with additional apertures, and the front and back are united by means of an accordion or bellows body of suitable length.

For the purpose of illustrating its capabilities we will suppose the camera to be furnished with two landscape lenses of the respective focal lengths of 5 inches and 13 inches, and a half-plate portrait lens, whose focus is 8 inches.

Then let the enlargement required ... = e
The focus of lens... ... ... = f
Distance of focussing glass from lens ... = v
Distance of object from lens ... = u
Distance from image to object ... = a

and adopt the following formula, we shall find that our camera and lenses enable us to do almost anything within the limit of 9 by 7, or whatever size our camera may be.

$$(e + 1) \times f = v. \quad \text{And} \left(\frac{e+1}{e}\right) \times f = u$$

As an instance of the method of employing this formula, we will suppose it is desired to enlarge a picture 3½ inches square to 7 inches square, with the half-plate portrait lens, the focus of which is 8 inches. The enlargement required, or e, is then equal to 2; the focus of lens, or f, is equal to 8; then

$e + 1 = 3 \times 8 = 24 = v$, distance of focussing glass from lens.

$\frac{e+1}{e} = \frac{3}{2} = 1{\cdot}5 \times f = 12 = u$, distance of object from lens.

$v + u = a$ or $24 + 12 = 36{\cdot} = a$, distance from image to object.

Great applause was expressed as Mr. Martin resumed his seat, after a clear and brief description of this excellent invention; at the conclusion of which,

Mr. Wall called the attention of the meeting to a new and very beautiful invention not mentioned by Mr. Clarke, viz., the panoramic lens and camera, of which they had doubtless all heard—(a laugh). He thought it a most valuable introduction, and through the kindness of Mr. Cox, the optician, was enabled to bring down the lens, camera, and a very fine specimen negative (a proof from which he hoped soon to place in the Society's folio). If Mr. Leake would carefully take round the negative, he thought its examination would be very

gratifying. The only difficulty that struck him was that of printing so as to obtain an equal amount of light upon every part of the negative during this operation.

Mr. SIMPSON thought this difficulty would not exist if the printing were carried on in a diffused light, and this seemed to be the general opinion of the gentlemen present.

Mr. STATHAM suggested printing from light reflected from a curved surface.

Mr. HUGHES thought diffused light would print best.

Mr. LEAKE suggested the removal of the film by a good transfer process, after which prints could be obtained in the usual manner.

Mr. HUGHES said he had frequently tried the processes for transferring, and found them all unsatisfactory, and that the collodion when transferred grew rotten and broke to pieces after a time, however carefully attended to. He should not like to risk the destruction of a good negative by any transfer process at present in existence.

Mr. WALL remembered seeing a gentleman, the proprietor of a patent, in the studio of Mr. Clarkington, remove the films from a number of negatives and positives with perfect ease and safety.

Mr. LEAKE thought if this could be done, a copy might be obtained, and all danger of the film growing rotten avoided.

Mr. HUGHES asked Mr. Leake to tell him frankly whether, as a practical photographer, he would or could advocate the destruction of a good negative for the sake of a copy, which never equalled the original by any chance?

Mr. HERVE could support the truth of Mr. Hughes's remarks, as he had tried shellac, gutta percha, borax, and many transfer processes, without finding one satisfactory.

Mr. HUGHES described Mr. Sutton's invention as a very fine one—a beautiful idea cleverly carried out; but with all his admiration of it as a perfect piece of mechanism, he feared it would not prove of any great practical utility.

Mr. HERVE mentioned a camera of his own making, which he called universal; and expressed some disappointment at finding Mr. Clarke's paper little more than a catalogue of the more recent introductions of different makers.

Mr. HOWARD defended the paper just read, and thought it pointed out many facts which were of importance, more especially to amateurs.

Mr. Martin's new camera was much admired as an illustration of a photographic *multum in parvo*.

A new stereoscopic camera for instantaneous pictures, very compact and portable, was exhibited by H. Squire & Co., at the request of the secretary.

Mr. W. CLARKE exhibited a collection of apparatus illustrative of his paper, which excited no little interest when examined before the commencement of the business of the evening.

Mr. G. S. TEAR also exhibited a small camera and stand for stereoscopic pictures.

Votes of thanks were awarded to Mr. W. Clarke and Mr. Martin.

A paper in continuation of the "Photographic Jottings" was announced for the next meeting, on Thursday, the 15th instant, by M. Hannaford, Esq., and a jotting about photographic print washing, by Mr. A. H. Wall.

Mr. HUGHES proposed the name of Sebastian Davis for election, and the secretary at once rose, with much pleasure, to second the motion. This gentleman and Mr. Neeld were then elected members, and the meeting adjourned.

[The Society's Presentation Photograph is now ready for circulation, and may be had, or seen, upon application to the secretary, Mr. Alfred H. Wall, 90, Cannon Street West, City.]

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE twenty-second ordinary meeting of this Society was held on the evening of Monday, the 20th ult., at the Golf Club House, Blackheath Hill — the President, J. GLAISHER, Esq., F.R.S., occupying the chair.

The minutes of the last meeting having been read and confirmed,

Mr. H. T. WOOD produced a very compact and ingenious developing box for the inspection of the members, which he exhibited and described, dwelling particularly upon its internal arrangements and portability, and stating his belief that it would supersede the necessity of carrying about a tent, with the disadvantages attaching to it.

The PRESIDENT then described, at some length, the method employed at the Royal Observatory for registering the diurnal variations in the thermometer, both wet and dry bulb, by photography, and exhibited several papers on which those variations were indicated.

He stated, generally, that the method did not differ very materially from that employed in registering the diurnal magnetic variations; that is, a ray of light is reflected upon a cylinder of sensitive paper, kept revolving by a chronometer movement, and so arranged that the column of mercury in the thermometer tube, as it rises and falls, cuts off or admits the light, and thus registers its deviations in an irregular curved margin, the value of which is afterwards calculated. The importance of photography, by which such unvarying self-registering results are obtained, is here clearly recognised.

After some pleasant discussion, arising out of Mr. Glaisher's remarks, the meeting adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE monthly meeting of this Society was held, in Edinburgh, on Tuesday, the 14th ult., Dr. WALKER occupying the chair.

The following gentlemen were elected members: Mr. W. Henderson, Royal Terrace; Major Johnston, H. M. I. S.; and Mr. J. F. Dudgeon, merchant.

The first business brought before the meeting was the report of Mr. Horatio Ross, on the award of medals for the best pictures in the Exhibition. The Hon. Secretary, previous to reading the report, stated that Mr. Ross himself was necessarily absent, being at present at Hythe, in connection with the Volunteer movement. Mr. Ross, in the report, after alluding to the honour done him by appointing him to such a responsible office, said that when he accepted it he felt that, no matter how anxious he might be to discharge the duty with impartiality, he could not hope to give satisfaction to all.

He first directed his attention to the *landscapes*, and from the vast number of good pictures, he had great difficulty in coming to a decision. He devoted four days to the investigation, examining the pictures both by daylight and gaslight. He commenced by setting aside fifty-eight pictures which he regarded as first-class, and regretted that instead of its being in his power to award a medal to each, he had only one. He went repeatedly over this reduced list, striking out those he deemed inferior, until at last the list was reduced to three — one by Mr. Mudd, one by Mr. Maxwell Lyte, and one by Mr. Dixon Piper. These were pictures of very great excellence, and he more than ever regretted he had only one medal for this class of production. He at last awarded the medal to Mr. Mudd, not that his picture was so much superior to the other two, but that in it there were fine gradations of distance, the background and foreground being equally excellent. Had the other gentlemen selected the same subject, their pictures, he doubted not, would have been as good.

With respect to *portraits*, he could not find more than twenty that had claims to consideration, and he decided in favour of Mr. Robinson's picture, *Here they Come!* which he hoped would meet with their approval.

With regard to the Maconochie Wellwood prize he had no difficulty whatever in awarding it to Mr. Rodger, of St. Andrew's; the only doubt in the case being as to which of Mr. Rodger's pictures was best entitled to it, they were all so excellent.

Mr. Ross concluded by congratulating the Society that, from year to year, there was a marked improvement in the Exhibitions of the Society.

A MEMBER said that Mr. Ross's award had given general satisfaction, very much more so than the last year's award.

Dr. WALKER said that his own opinion might be learned from the fact, that no sooner did he see Mr. Mudd's picture in the room, on the first day of the Exhibition, than he at once purchased it.

Mr. Rodger (the only one of the successful competitors who was present) was then presented by the chairman with the Maconochie Wellwood prize, amid great applause.

Mr. RODGER, in returning thanks, said he felt highly gratified by the honour conferred on him — an honour esteemed the greater by him both from the complimentary terms in which they had spoken of his works, and from their considering them worthy of this award among so many able specimens of the photographic art. The duty of making the selection was a most difficult one; for many of the pictures displayed the highest skill in grouping, combined with manipulative dexterity. The award, therefore, of this prize by those who were justly esteemed the foremost in the photographic art, in judging of the beauties and delicacies of finish rendered in any picture, would, while it should never lessen his high appreciation of the works of merit of any professional brethren, cause him to prosecute with greater zeal the practical study of the science both so as to extend its limits and advance its onward progress towards perfection; for still much remained to be done, many new fields to be explored; and he hoped that the munificence of such worthy patrons of photographic art as Mr. Maconochie Wellwood, the donor of the prize now awarded him, would, by their praiseworthy liberality, excite a spirit not only of competition but of inquiry, which would, without fail, further the progress of the art, and be the means of producing works even of greater merit than what had this season been exhibited. To him all lovers of their pleasing art were much indebted, and, without doubt, felt grateful for his liberality. He concluded by again returning them thanks for the honour they had conferred on him.

Two pictures were exhibited, taken by the new panoramic lens.

In answer to a question, the SECRETARY said that the lens was, to a certain extent, a fluid one, and the negatives were taken on a curved plate of glass.

A MEMBER said that he could almost with certainty predict that this lens would never come into favour. In the first place the results were by no means satisfactory as to sharpness, although the views were selected apparently with a special reference to hide any defects a lens might have in the way of not giving a flat field; for in both pictures the objects in the *centre* were at a much greater distance from the camera than the sides, which were quite close at hand. The second objection was that a *curved* glass, instead of the ordinary flat plate, was required on which to take the picture.

Several other members expressed themselves as to the want of sharpness in the sides of the pictures.

The Hon. Sec. then read a paper, written by Mr. J. Mudd, of Manchester,

On the Collodio-Albumen Process.

Mr. Mudd began by expressing his regret that he was unable to be personally present on this occasion, but that he was very much gratified that it was his good fortune to gain such distinction as being entitled to one of the Society's medals; and it was an additional source of gratification to him that the picture to which had been awarded the prize was by a dry process; for although wet collodion possessed some advantages, yet, to a photographer in search of the picturesque, dry collodion, by enabling him to dispense with dark tent, dishes, &c., very far outweighed it, especially as the results were at least as good. Wet collodion, on a journey, was so troublesome, that he sometime since registered a vow that if nothing simpler could be got he would give it up altogether. He was convinced that, in adopting the collodio-albumen process, he had adopted a standard process, one on which every dependence might be placed. He first practised this process during a tour in Wales, and with complete success. Some of the views taken on that occasion were exhibited in this Society's Exhibition of 1858 and 1859.

He then described the process itself, which he said was almost identical with that originally described by M. Taupenot.

The first thing to be done was to have the plates thoroughly cleaned. Each one had his peculiar method of doing this: the one he employed was by a mixture of tripoli and spirits of wine. The plate was then coated with collodion in the usual manner, and excited in the ordinary nitrate of silver bath. It must then be washed with clean water to get rid of most of the free nitrate. Iodised albumen is then poured over its surface twice, and the plate allowed to drain, standing on one corner, for five or ten minutes. After this it is made quite hot, which has a wonderful effect in ensuring adhesion to the glass plate.

The iodised albumen consists of—

Whites of ten eggs.	
Iodide of potassium	50 grains.
Bromide of potassium	10 „
Liquor ammoniæ	100 minims.
Water	2½ ounces.

These must be well beaten together in the usual way. The plate prepared in this way will keep for years. Before using, it must again be immersed in a forty-grain aceto-nitrate bath, and then well washed with water. A plate that has been thoroughly washed will keep longer and develop cleaner than if the washing was imperfectly performed. In cool weather the plate would keep in this state for about six weeks, although he had often kept them much longer. With respect to the sensitiveness of plates so prepared, he thought it might be about five or six times slower than wet collodion, but one or two trials would decide that better than all he could say.

The development might either be conducted with pyrogallic or gallic acid. If the former, the plate is placed on a stand, a little water poured over its surface, and then a sufficient quantity of the following:—

Water	1 ounce.
Pyrogallic acid	2 grains.
Glacial acetic acid	½ drachm.

As soon as the sky or high lights begin to appear, a few drops of a ten-grain nitrate of silver solution must be added, which will have the effect of bringing out all the details. Should streaks or spots appear, they may be rubbed off without detriment to the picture, as the film is very hard. To know when a picture is properly developed is a nice point, as it often looks more intense in the dark room than when it is brought out to the light. They should not judge of its merits by the blackness of the sky, but by the details. A good picture has no part very black.

If gallic acid was used as the developer, the solution must be a saturated one. After the plate has been immersed in it for five or ten minutes, a few drops of nitrate of silver must be added occasionally until the development is completed. The fixing was effected by hyposulphite of soda.

After stating that this process was not his own, but that he had merely adopted it, he begged they would allow him to introduce this stranger among them. He concluded by stating that the camera he used was that invented by Mr. Kinnear, and he testified to its many good qualities.

Mr. J. T. Taylor said that, before any discussion took place on the subject, he would make a remark. English photographers, and Mr. Mudd among them, seemed rather inclined to give Scotchmen credit for less knowledge in photography than they really possessed. If he heard aright, Mr. Mudd spoke of *introducing* this process to their notice, whereas the Edinburgh photographers had been familiar with it since it was originally introduced by Taupenot; and vast quantities of transparencies were manufactured by this process in Edinburgh for the London and other markets.

Mr. Walker said that last year he had tried this process, but he found that the length of time required for the developing was a great drawback. Some pictures required three hours.

Mr. Orange said, that were the developer used in a tepid condition, it would reduce the time to about five minutes. He had had a great deal of experience with Taupenot's process, and for transparencies he preferred it to all others. It was very much more sensitive than the ordinary albumen process.

Mr. Taylor advocated the use of protosulphate of iron as a developer, not only for this but all the other dry processes. The certainty attendant on its use was greater than when gallic acid or pyrogallic acid was used; while the time of developing was so reduced as to make it a question of seconds, rather than of minutes or hours. Two interesting topics, he thought, might here be discussed with great advantage. First, what part was the first layer of collodion in Taupenot's process supposed to play? Was it a merely mechanical part in separating the albumen from the glass, or was it a chemical part, or both? The second was an investigation into the cause of the greater energy of iron than gallic acid as a developer.

Dr. Paterson thought that the layer of collodion had a chemical effect. This he supposed to be a union of the traces of free nitrate in the collodion with the iodide in the albumen.

Mr. Taylor said the experiments of some of the members of that best of all societies—the original Liverpool—went far to establish that the effect of the collodion film was more mechanical than chemical, for one of them had tried plain unexcited collodion with a satisfactory result; and, besides, he could scarcely agree with Dr. Paterson as to the chemical action he supposed took place, for in the washed collodion film—washed, too, with common water in which there existed chlorides and other salts—there could not be left any free nitrate of silver to combine with the iodide of the albumen. He then entered at some length on the cause of the greater energy of iron salts over pyrogallic and gallic acids in developing. The latter had, more than the former, a destructive effect on a latent image, analogous in this respect to iodine or chlorine on an impressed daguerreotype plate, or to iodide of potassium and other substances on an undeveloped collodion picture.

Mr. Dudgeon, of Cargen, said that whatever the cause might be, the fact was evident that iron developed dry plates much better than pyrogallic acid. Some time since, he took to Sweden a lot of plates prepared by Dr. Norris, and developed them all with iron. The negatives were all completely successful.

After some remarks by Mr. Burns on developing plates prepared by "Fothergill's process," and by Mr. Macnair on wort, as a preservative agent, in lieu of the raspberry syrup, treacle, beer, and other modifications of or substitutes for honey, the meeting separated.

PHOTOGRAPHIC SOCIETY OF IRELAND.

The monthly meeting of this society was held on Friday evening last, the 24th ult., at the Royal Dublin Society's House—Frederick Sanders, Esq., in the chair.

The minutes of the previous meeting having been read and confirmed, H. T. Vickers, Esq., Honorary Secretary, read a paper, by E. K. Tenison, Esq., J.P., D.L., County Roscommon, descriptive of a paper process. Mr. Vickers read a communication from Mr. Tenison, regretting his inability to attend the meeting of the society owing to his detention on important business in London.

Mr. Tenison's observations were, in effect, that he had tried almost every process of photography, from its first introduction by Daguerre on the silvered plate, up to the present time, on both waxed and unwaxed paper, together with the albumen and collodion processes on glass,—having been much devoted to each in its turn; but, having almost given up the science altogether, he might now be allowed to express an opinion on the merits and advantage of each system without being considered prejudiced in favour of any. The extreme minuteness of definition in the daguerreotype system could not be denied, nor could it be excelled even by the collodion positive picture on glass. The process, however, had its disadvantages, which did not require recapitulation. In point of definition the albumen process seemed to come next, to which process, he thought, justice had not yet been done. The process was certainly slow compared with the collodion; but the albumenised plate retained its sensibility so long, that it fully equalled in point of convenience the dry collodion. Mr. Maxwell Lyte was the only successful manipulator of the dry process whom he had ever seen, and his results he considered beautiful. He had seen Mr. Lyte travelling with his dry sensitised plates, and never knew of a failure. Still, however, there was great inconvenience from carrying so much glass. The advantage of the paper process to a travelling photogropher was immense, provided it was limited to architectural subjects and landscape scenery. Figures could rarely be introduced, except as Count O. Aguado did, who carried with him various lay figures of both sexes, which, after being dressed in the costume of the country, he placed in the most prominent positions to suit his pictures. It was true the development of a paper negative was slow, but that prolonged the pleasure to an amateur. There was little danger of over-exposing a waxed-paper negative, whereas, with a collodion, a minute more or less might spoil the result; besides, one hundred paper negatives, sixteen by ten, could be easily carried in a portfolio weighing less than two glass plates of the same size. He thought that each paper process or formula had a paper more or less adapted to it. The Fox Talbot process he generally found best on old English paper; whilst the French and German papers probably suited best Le Gray's process, having been previously waxed; but Baldus's plan succeeded best with a papier Saxe. He found Le Gray's printed formula excellent. From him he learned the waxed-paper process, and worked with his paper successfully for several years. He afterwards became a pupil of Baldus, and a convert to the calotype or unwaxed method of iodising. This process was perhaps rather more troublesome

than the other, as the negative picture, when fixed with hypo, &c., should be well waxed before it could be used in the pressure frame for printing. This process he found more generally successful, and produced cleaner negatives and darker skies. He did not think that climate or temperature much affected the methods of Le Gray or Baldus, whereas the collodion amateur constantly found his bath out of order without any apparent cause; indeed, so far as his experience went, he had found collodion capricious and uncertain in its results. He had, according to the Baldus mode, iodised in a few days sufficient paper to serve him a year or two, and never found it to deteriorate when kept dry. If a paper negative, from exposure or over-development, became too dark for printing, it could easily be rendered clearer by a chemical process which had been adopted by French photographers. The same chemical action would cleanse a negative if injured by the nitrate of silver from frequent contact with positive sensitised paper. Sir William Newton, he believed, worked the calotype process, and sensitised with a glass rod. He had tried that for some time, but found it far more difficult than either of the other processes which he had mentioned. He recommended all beginners to adopt one system, and not to attempt various methods. Each process had its advantages and disadvantages, but each was capable of producing good results. There was no more difficulty in manipulating a piece of paper 16 inches by 12 than there would be in manipulating one half that size. He strongly recommended Baldus's system, because of its simplicity and general success. In his photographic excursions the whole of his apparatus, except a few glass bottles for solutions, was entirely of gutta percha, thus avoiding all danger of breakage.

The CHAIRMAN remarked that, of course, there was a great deal to be said in favour of paper, as compared with glass, on account of its portability.

Mr. VICKERS said it was very much to be regretted that they had not been favoured with more detail as to the exact manipulation. However, it was right to state that it was not Mr. Tenison's intention to leave them in the dark, as he originally hoped to have read the paper himself—to have explained how the process was to be carried out, and to have exhibited the manipulation. However, on a future occasion they might expect Mr. Tenison's explanation.

Mr. BEATTY then exhibited a number of photographic engravings, according to the Fox Talbot method, and produced the negative and copperplate of a programme of the Royal Dublin Society's meetings for the evening. In his paper, explanatory of the process, Mr. Beatty remarked that Mr. Fox Talbot's productions possessed almost all that could be desired in minuteness of detail, depth of shadow, and graduations of half-tone, which had never been approached by any other process hitherto adopted. They realised the aspirations of the enthusiastic photographer, by affording permanent pictures of the fleeting images of nature, reproduced by means of the printing press. Having referred to Nièpce's plans, Mr. Beatty characterised them as simple, and gave him the credit of being the first to fix, not only a direct positive photograph, but also to secure on metal and glass plates the images of the camera obscura. The simplicity of his plans arose from the tendency of light to dry certain varnishes, and to make them insoluble. When so dried, the portions not acted on by the action of light washed away by certain solvents. Asphaltum was employed with oil of lavender to produce a varnish with which the plates were coated; when partially dry, they were exposed to the light with an engraving superimposed, or they were placed in the foci of a camera obscura, and after a time a photographic image was obtained on the varnished plates. This image was not visible, and the plate had to be subjected to the solvent action of a mixed liquid, composed of one part of oil of lavender and ten parts of mineral naphtha. On immersion in this fluid, wherever the light acted, the varnish became insoluble, and in a certain degree proportionate to the intensity of the light. The shadows of the picture were now represented by the parts of the white metal or glass laid bare by washing with the solvent: the lights were given by the film of varnish which had been hardened by the action of light, and which had been left untouched by the solvent. The plate was etched by the ordinary method used by engravers, by the application of an acid; while the shadows and demi-tints, partially or wholly denuded of the varnish, were "bitten" into the plate by the acid. On washing the plate and removing the varnish, an etching was produced, capable of being charged with printing ink, from which impressions could be taken in the printing-press. The method with which Mr. Fox Talbot used to produce engravings on steel and copper was simple, but required great care in the manipulation. A plate of polished steel or copper might be used; the plate should be perfectly clean, and coated with a solution of gelatine and bichromate of potass; it should then be dried over a spirit lamp; when cold, a photographic glass was to be laid on the coated plate, and placed for a time in diffused daylight, in order that it might pass through the transparent portions of the picture into the gelatinised surface. Experience could only make known the time which the plate should be allowed to remain in this position; it was then to be placed in a dark room where it had been previously coated, and, when breathed upon, the subject which covered the plate would appear in all its detail. Mr. Talbot, instead of washing the plate, sifted over its surface some finely powdered gum copal very thinly and evenly, so as to form an engraver's aquatint ground: he then heated the plate over a spirit lamp, to melt the coating which would adhere to it in finely divided particles; and then applied, with a camel-hair brush, perchloride of iron, slightly impregnated with water, graduated to the proper strength, which could only be ascertained by experience.

Mr. BEATTY was warmly applauded at the conclusion of his explanation of the process.

Mr. VICKERS said it was right to mention that the plates had never been touched by a graver.

The CHAIRMAN inquired the length of time necessary for exposure?

Mr. BEATTY replied that in diffused daylight it required an exposure of about three hours, but in the sunlight it would take only about so many minutes: he preferred the slow action.

The meeting was then adjourned.

LIVERPOOL PHOTOGRAPHIC CLUB.

THE usual monthly meeting of the above was held at the house of Mr. Bell, on Tuesday, the 14th ult. There was a full attendance of members and some visitors.

Mr. BERRY exhibited an extremely fine proof of *Conway Castle*, from a negative two feet square. This negative, upon one of Hill Norris's plates prepared expressly for the operator, was very clear in detail, the tone of an even character, and the shadows, although deep, sufficiently transparent. A further peculiarity connected with this picture, was the fact that it was taken with a lens (four inches and a-half in diameter and about three feet focus) which had been sent by a dealer of great repute to a very good customer. He had returned it, saying it was not capable of covering a surface of five inches with accuracy; whereas the clearness and sharpness of outline were remarkable in this vast print, up to its extreme edges: thus the learned differ. A further difference of opinion was exemplified when

Mr. COREY showed two negatives on waxed paper, taken during the late severe weather, and commented upon their imperfect transparency, although prepared by the iodising solution containing cadmium so much recommended by Mr. Long, who asserts that "you thereby get rid of the granular appearance" so offensive in most waxed paper. These negatives were bold and energetic, clear in outline, and full of definition, but many of the shadows were woolly. He was disposed to think this arose from bad glacial acetic acid. In this Mr. Cook fully concurred; whereas Mr. Bell, who has had much experience, laid the fault to the paper, with a great show of probability, for it was a specimen of Canson's, made many years ago, and waxed nearly as long. On the other hand, Mr. Berry attributed the defect to a want of sufficiency of silver in the sensitising solution, whereby an equal balance had not been preserved in forming the iodide. Mr. Hooper, in a paper read at the Chorlton Society, had strongly insisted on the necessity for this.

Mr. FORREST exhibited some extremely fine stereoscopic prints, sent to him by Messrs. Anthony, of New York. These were taken in the most crowded thoroughfares, and gave a very vivid idea of the busy throng. They were remarkable for having been taken by a process instantaneous almost to a miracle; for though persons and vehicles were evidently in rapid motion, not a single figure was blurred or uneven in the outline; nay more, the steamers crossing from New York to Brooklyn had every individual ripple in their wake crisp and distinct as in nature.

Mr. BELL also exhibited some very large views of the mighty waters of Niagara. These were very choice, and gave the beholder a grand idea of the horse-shoe form of the Falls.

Mr. FORREST, having been urged by several friends to correct many errors which had crept into print of late on the subject of glass manufacture, now proceeded to read the first of a series of papers on the subject of glass-making generally, and for photographic purposes especially. [See page 64.]

After a very social evening the members separated, looking forward with pleasure to the next meeting at Mr. Forrest's.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this association was held on Tuesday, the 8th ult. Mr. JOHN FAWCETT occupied the chair.

After some preliminary business, Mr. WARDLEY called the attention of the meeting to the many formulæ recently brought forward for the collodio-albumen process, and noticed how slight was the difference in any of them from the original process as introduced by M. Taupenot. With the consent of the meeting, and in order to discuss this subject fully, he proposed to occupy some of the time of the next meeting by reading M. Taupenot's original paper. He made this announcement in order that gentlemen might be prepared.

Mr. HOOPER exhibited to the meeting an actinometer, made according to the formula of Dr. Woods, of Parsonstown. He had found it very sensitive to light, but it was also affected by heat; and he then explained how that difficulty might be overcome without recourse to a thermometer.

This actinometer was thought to be a very simple and useful instrument for the photographer, and the explanation and discussion of its merits being interesting to the members, it occupied the meeting a considerable time.

A MEMBER inquired if Mr. Griffiths was prepared to address the meeting on the enlarging process he had before mentioned to the Society. He made this inquiry because he had heard of a picture, five inches by four, being enlarged to sixteen inches by fourteen, perfectly sharp, and he was anxious to know something more on this subject.

Mr. GRIFFITHS, in reply, said that he was ready to do so, but should prefer waiting until the next meeting, when he expected to be enabled to show specimens.

Mr. Rogerson thought that from the efficient manner in which Mr. Hooper had treated the subject of the actinometer, he deserved the thanks of the Society, which he moved should be given to that gentleman.

This was seconded and carried by acclamation.

A vote of thanks having been accorded to the Chairman, the meeting concluded.

CALEDONIAN PHOTOGRAPHIC CLUB.

This Club met on Friday evening, the 17th ult., in the apartments of Mr. Steele, who was host on the occasion, and, according to custom, occupied the chair.

The Secretary having read the minutes of the last meeting, Mr. Montaigne said:—A few days ago, on arriving here from a journey from Ireland, I saw in The British Journal of Photography a report of the proceedings of our last meeting, and I must say, without meaning any offence to our Secretary, I never saw a worse report in my life. By no means would I insinuate that anything garbled or untrue exists in the report, but I am dissatisfied at the idea of a long and interesting meeting, replete with debate, being crushed up in such a nutshell report as the one in question. If our transactions are worthy of publication at all, they are surely worthy of being given in their entirety.

Mr. Wilson: For want of experience I just adopt the method usually employed in procuring reports of some other societies, such, for instance, as our elder brother, the Photographic Society of Scotland: I send for publication only so much as I deem expedient should meet the public eye, and in order to ensure accuracy in any remarks made, which I consider worthy of publication, I usually request each speaker to furnish me with a written copy of what he said.

Mr. Montaigne: I am well aware that such has been the case; but in order that some Society should set the example of putting a stop to a system which is so unfair to the photographic reading public, I propose we secure in future the services of a professional reporter.

After further discussion on this subject, it was agreed that the Secretary should communicate either with Mr. Kinnear, Dr. Diamond, or Mr. Shadbolt, with a view of getting the benefit of some of those gentlemen's experience in furnishing reports.

Mr. M'Adam then read a paper *On Printing Glass Transparencies.*

[The MS. of this paper having only come to hand just as we were going to press, it must unavoidably lie over for a fortnight, together with the discussion that followed on the subject.]

The thanks of the meeting were cordially awarded to Mr. M'Adam.

A conversation ensued on the subject of professional photography in Edinburgh.

Mr. Brown said that, if he had been rightly informed, Princes Street would soon be one great photographic establishment from end to end, as he believed that several photographers of standing were about migrating thither:—Tunny, of Clerk Street; Rodgers, of St. Andrew's; Duboscq, of Paris; together with two eminent London photographers, whose names he was not at liberty to mention—all contemplated removing there at Whitsuntide. Ross and Thompson he also believed were leaving their present place in favour of more suitable premises.

The Chairman said that he knew for a fact that every suitable place in North and South Bridges, and other important streets, had been eagerly sought after by photographers; and from the number of new ones about to be established in the minor streets, together with a great anticipated addition to the already numerous host of "travelling artists," he had no doubt that the lieges in this part of the kingdom would, in the ensuing summer, get their portraits taken at a great reduction on the prices of last year, which, in the Canongate, were threepence each, including a gilt frame.

The remainder of the transactions will appear with Mr. M'Adam's paper in our next.

Manchester Photographic Society.—In our report of the last meeting of this society, it was stated that Mr. Cottam contributed to the society's folio a print from a negative taken by the panoramic lens; the donor requests us to mention that the proof in question was a developed print, produced by Mr. Sutton from a negative as quoted.

Exhibition.

LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Second Notice.]

Press of matter precluded the possibility of our continuing this notice in our last. On reference to our catalogue, we perceive that our next memorandum relates to the contributions of Mr. Lyndon Smith, of Leeds, a gentleman whose name is well known as an ardent photographer, but with whose works we have not hitherto been familiar. In glancing at Nos. 23, *Valley of the Wharfe, Early Morning*, and 47, *Study in the Valley of Desolation*, it is impossible to be otherwise than struck with the fact, that the producer must possess a strong appreciation for the beautiful and artistic, and yet, strange to say, we have rarely felt more disappointed than after examining the two specimens we have named. There is a peculiar *spottiness* and confusion about them that is very unsatisfactory, and the exaggerated effect of attempted atmosphere is carried to an extent that causes one to tremble on account of the anticipated attack of rheumatism and bronchitis from being exposed to such a dense mass of vapour. These failings are the more provoking, because they are not only evidently under the artist's control, but it is manifest that he is capable of better things, as witness for instance his *View of Knaresborough* (No. 67), which is soft, clear, and verging on the very opposite extreme of manipulative dexterity, being only so far short of failing from over-exposure as to be almost liable to a charge of want of vigour; while in the two previously mentioned the details in the foreground are unpleasantly hard. This (No. 67) is, however, a very charming production, and forms a beautiful illustration of our quiet English landscape pictures. It is a great pity that one who evidently possesses in an eminent degree the artistic element should suffer himself to be led astray by the conventional mannerisms which we have noticed. We have been told that the aqueous-looking atmosphere does not exist in the negative, but that it is an effect produced in the printing by what has been decried as a "trick." We do not perceive, by the way, the justice of such a designation. If it be a "trick" it is a clever one, though in our opinion in the instances cited carried to an unreasonable and detrimental extreme; with somewhat less of straining after effect, the operation, whatever it be, might be very probably beneficially applied.

Mr. Dixon Piper contributes many carefully-executed subjects, amongst which we admire No. 479, *The Old Curiosity Shop at Bury St. Edmunds*—an illustration that forcibly calls to mind the work of that name by Mr. Charles Dickens: we almost expect to see the figure of "Little Nell" emerge from the shop door. Another very excellent production by this photographer is No. 178, *A Cottage, near Ipswich*, which is very cleverly treated, though perhaps there is in the cottage itself rather too marked a patch of white in the composition, which would be improved if this part were a trifle deeper in tone.

Mr. J. Spode has a keen eye for the picturesque, and contributes many very exquisite productions. No. 435, *Lilleshall Abbey, Salop*, though a little spotty, is very artistic in treatment. No. 445, *Goodrich Castle*, by the same gentleman, and No. 457, *Netley Abbey*, are perhaps some of his best.

Mr. Vernon Heath has produced some very nice pictures. No. 452, *The Cottage Porch*, is especially worthy of commendation.

Mr. Victor A. Prout has very successfully rendered a number of interiors, many of them subjects in Westminster Abbey, of which Nos. 254, *The Cloisters*, and 277, *The Tomb of Edward III.*, may be taken as fair samples.

In noticing Mr. Fenton's works we omitted to mention one with which we were specially pleased: No. 304, *Altar of the Sodality Chapel, Stonyhurst.*

Mr. A. J. Melhuish, of Blackheath, furnishes many interesting scenes, amongst which there is one that we have often seen pourtrayed before, but never with anything like success until now: we allude to No. 330, *Black Gang Chine*, in the Isle of Wight. The fact is that it is a very difficult subject to convert into a *pleasing* picture.

Messrs. Bisson Frères, in addition to other subjects, exhibit a very effective *Panoramic View of Mont Blanc.*

M. Gabriel de Rumine unfortunately sent in his contribution at so late a period that there was not a particle of space left uncovered on the walls or screens when they arrived, and they are consequently hung at the back of the screens, but in so bad a light that we could not properly see them either by night or day.

A similar observation applies to some American photographs, which, like the last named, are not mentioned in the catalogue; but they have the advantage of not being hung at all, but simply stand upon the seat and rest against the screen, so that visitors with an inquiring turn of mind can examine them by taking them in their hands. They are well worthy of examination, and represent scenes materially differing with those with which most people on this side of the Atlantic are familiar.

The screen next the door is devoted principally to stereoscopic subjects, of which there are many by Mr. Russell Sedgfield that have been already noticed in our columns. Mr. Bedford appears also as a producer of stereographs, but we do not think him nearly so successful in this branch of photography as in his usual walk, most of the specimens exhibited being in our opinion far too hard. There is a frame standing on one of the seats containing stereographs by Mr. Woodward, of Nottingham, which, though not nearly so natty and sightly in the mounting as many others that

are better displayed, possess intrinsic merits far superior, and will repay examination.

We now come to a point in which we take peculiar interest—a comparison of the results produced by several of the dry processes; of which we have in the present collection a very fair exposition. Our friend, Mr. Rosling, as usual shines in his manipulation of collodio-albumen plates by the original process of M. Taupenot; and in several of his frames of four subjects, one or more by the ordinary moist collodion may be noticed, as introduced for comparison. Nos. 4, 19, and 71 are excellent illustrations in Mr. Rosling's happiest manner. The printing of Mr. Rosling's specimens is also super-excellent.

Mr. James Mudd, of Manchester, is also a disciple of the collodio-albumen process, and an eminently successful one. His picture, which gained the prize medal of the Scotch Society, we have already noticed His *Moat and Bridge, Chorley Hall, Cheshire* (No. 10), is scarcely less successful, as also No. 224, *View from the Cloister Window, Fountains Abbey*, and No. 424, *View in Scardale, Lancashire.* Those who talk of the *hardness* of collodio-albumen productions should examine those we have just cited, and we have no hesitation in declaring that they must necessarily admit that hardness is not a failing that need ever be incurred when working by this process.

Of Mr. S. Bourne's specimens (No. 50), by the Fothergill process, we have already spoken in favourable terms.

Mr. Sykes Ward, with his modification of the collodio-albumen, is not so successful, most of his pictures exhibiting the peculiar brain-like markings in the skies of which some operators complain. One specimen, however, his *View on the Wharfe* (No. 179), is good, and free from the defect alluded to.

Dr. Hill Norris's process finds favourable illustrators in the persons of Mr. Melhuish and Mr. A. R. Hamilton (Nos. 113, 329, 347, 385), &c.

The oxymel process has its advocates in Mr. Penny (Nos. 384 and 420), Mr. Barber (No. 410), Mr. Melhuish (No. 346), Mr. Baynham Jones (No. 112), &c.

It is, however, to the exertions of a lady, Mrs. Verschoyle, that we are indebted for illustrations of the largest number of preservative processes by any one operator, as shown in Nos. 72, 314, 428, &c., which include proofs from negatives by the honey, dry collodion, and collodio-albumen processes, fairly contrasted.

The conclusion at which we arrive relative to the results obtainable by the various preservative processes, is—that when properly worked each one is capable of yielding first-rate productions, and that the choice of any one of them should be rather dependent upon the peculiar convenience of each operator, than upon any fancied superiority as regards excellence inherent in any one of them.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VI. *(Continued.)*

DRAPERY.

If the head has been properly lighted you will find great roundness produced by the folds of the drapery and its gradations of shadow, which it must be your especial care to preserve. Remember to graduate the strength of your high lights and preserve the relative intensity of the shadows, deeper shadows being, of course, associated with the fainter high lights, except where powerful reflected lights moderate their intensity. Keep the more prominent folds lightest, that the effect of retiring surfaces may be increased; and if the number of folds appears destructive of breadth, judiciously omit such as play no important part in the expression of form, or texture, and are situated near the larger mass of light. Finding that the particular quality and character of drapery is indicated by certain peculiarities in the folds, be careful not to destroy their effect. You will find small narrow folds have a tendency to angularity, and larger folds to curves; do not, therefore, give the one species a characteristic peculiarity belonging to the other. The specific quality of surface being (as I have said) indicated by peculiar lights and shadows, and by characteristic folds, you will perceive the danger of making any alterations in a good photograph, in which all these qualities are displayed in such wonderful perfection. However, to assist you in recognising (and consequently preserving*) these important points, I will just note down a few of their peculiarities.

* The reader will have noticed the constant repetition of this word, purposely introduced to impress upon his mind a principle which should never be out of the colourist's view. *Carefully preserve* may indeed be here called my motto.

CLOTH.

The folds in cloth (being a rather thick and soft material) have much beauty, are broad, rather flat, and greatly varied in their character. The lights, unless where the surface is very glossy, are not strong, will be easily discovered upon the most prominent parts, and are very soft in their character. Shining lights will be found tracing the channels formed in the hollows between the folds, or in their breaks; which lights are more abrupt than high lights, although very nearly as strong. The reflected lights are weak. Without advocating a servile imitation of various stuffs, I certainly think each should be so represented as to leave no doubt in the spectator's mind as to what the drapery is really composed of.

SATIN.

The folds of this material are somewhat conical and are frequently broken into crescent-shaped terminations in consequence of its stiffness. Its reflected lights are strong, its high lights brilliant and well marked, and its shadows seldom very intense, in conquence of the presence of reflected lights of a more than usual strength and number. The masses of light and shadow are generally very picturesque, and may be judiciously strengthened by a proper gradation of the lights, shadows, and reflections, from the lighted to the shadowed portions.

VELVET,

being seldom photographed well, demands more attention than other surfaces. It is very picturesque when well managed, and is so strikingly different from all other materials as to be easily recognised. The prominent parts are darkest, and the lights are found near the edges of the folds, or receding parts, and wherever the undulations of the surface cause the pile to catch a stronger light. Velvet being very thick and soft, the folds are massive and rounded in their contours and the breaks are more gradual.

FUR

is very perfectly displayed in good photographs, and should not be destroyed in the colouring. Its character resembles closely that of velvet, and the lights are discoverable *near*, but not so *close to*, the edges, because the surface of hair is more raised and open than the pile of the velvet; for the same reason its edges are more transparent, and blend imperceptibly with the surface upon which it lies. The prominent parts of fur are dark, its reflected lights strong, and its folds large.

I do not think I need offer any further remarks upon the subject of drapery here, as you are sure to be correct if you adhere closely to the photograph, and duly consider the nature of the surface to be rendered, whether it be rough, smooth, or polished. And thus end my remarks upon "touching" photographs.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

An Amateur (Rochdale).—The backgrounds you describe may be mere flat washes of body colour floated on with a large full brush, or they may be procured in the following simple and effective way:—Take crayon in the powder, mix the tint or tints required, and rub them in with your finger, adding, blending, and evening up until the result you desire is obtained. With regard to the beauty of such clean opaque grounds, you and I do not agree, although (per desire, or to meet the demands of undue haste) I sometimes finish backgrounds in the way described. If the artist near you uses the chalk-process, you will find no difficulty in emulating him; but it is as well to put in the background first, as there is some danger of rubbing the chalk over portions of the figure which would be of less consequence before, than after colouring.

G. R.—Varnish is generally adopted for the purpose; but there is another plan:—Coat the surface with rather strong gum-water, apply the powder colours, and afterwards wet the back of your picture until the gum dissolves and fixes the colours. Isinglass dissolved in gin is sometimes used for the same purpose, just as you would the varnish; and I have heard of a solution of white wax being applied in the same way. The whites of dry colours are generally prepared from calcareous earths. Flake white would never do, as it always darkens if unprotected by oil or varnish. The contractile influence of varnish upon powder colours, is the origin of the effect you describe. Try a weak solution of resin in spirits of wine. I cannot enter more fully into the subject upon the ground of fairness to others.

Foreign Correspondence.

Paris, February 22, 1860.

The first meeting of our Photographic Society for the present year was remarkable for an incident which will probably form an era in photography. Three observers, situate at a great distance from each other, united in calling attention to a peculiarity in the collodion process which hitherto had passed unnoticed, viz., the possibility of obtaining at will, from a collodioned plate, either a positive or a negative picture. The first of these observers, Count Schouvaloff, describes his process as follows:—The collodion must be very feebly iodised, and of a kind that will yield a very weak

image. The exposure must be very short, and followed by a development with pyrogallic acid so rapid that it can scarcely be imagined or suspected that the negative image is in the latent state; the plate is then freely washed in a stream of water, so as to entirely remove the developing solution; then a small quantity of an old nitrate bath is poured over the washed plate, and after it has remained a sufficient time it is poured off, and the plate shaken so as to remove streaks, ensure a uniform surface, and as thin as possible; the plate is then set to drain, placed in a horizontal position, and the developing renewed with pyrogallic acid, which is allowed to remain some time in contact with the surface. If the operation has been well performed, and particularly if the original coating of collodion is perfectly uniform, the developed picture will no longer be a negative, as it would have been if the first development had been completed, but a positive picture, in which the opaque parts correspond to the opaque portions of the model, and the transparent parts to the lights, &c., and which may be toned or intensified by means of chloride of gold and other analogous agents. The Count adds:—"I remember to have read somewhere that effects of this kind are obtained by exposing the collodion to daylight during development. But I am quite certain that in my experiments light had nothing to do with the result, since I took the greatest precautions in this respect without any difference."

M. Poitevin, another photographer, whose name must be well known to you in connexion with photo-lithography, states the following as the result of his experiments:—1st, A layer of iodide of silver, in presence of nitrate of silver, and exposed to the light, is blackened by pyrogallic acid. 2nd, The same exposed layer, washed to remove the nitrate of silver, and covered in the dark with a solution of iodide of potassium, again washed, and then covered with a solution of nitrate of silver, is also blackened by pyrogallic acid. 3rd, The very brief action of light upon the preceding layer, previously exposed and iodised, removes from it the property of being blackened by pyrogallic acid. That understood, proceed as follows:—Iodise the plate with a weak iodising solution, and sensitise in the usual manner; expose the sensitised plate to direct light for a few seconds; it does not change in appearance; remove the nitrate by copious washing in water; cover the impressed surface, in the dark, with a solution of iodide of potassium, of four grains per hundred; if the surface has become dry, substitute the alcoholic for the aqueous solution of this salt; it is on the layer thus prepared, in which the nitrate of silver is replaced by the iodide of potassium, and which has in consequence lost the property of being blackened by pyrogallic acid, that the light is made to act. When placed in the camera to receive a direct or positive image, the exposure must be three times as long as in an ordinary negative picture; after exposure, the plate is washed in distilled water to remove the excess of iodide of potassium; it is then immersed in a weak bath of nitrate of silver, and treated with acidulated pyrogallic acid, which only blackens the parts *not* acted upon by light; we thus obtain a picture in which the *chiaroscuro* is the exact counterpart of nature. The sensitised layer covered with iodide may be kept unimpaired some hours before exposure, but as the action of the iodide of potassium takes place by degrees even in the dark it must not be kept too long. M. Poitevin added, that he substitutes lactic acid for acetic acid in the preparation of the solution of pyrogallic acid. He sees in his process a means of obtaining direct transparent positives, by which proofs in ordinary ink may be printed according to a process he has invented. At the meeting he exhibited some stereoscopic positives, which, although taken by an inexperienced hand, were as good as the positives on albumenised glass, produced by M. Ferrier, but so difficult to obtain by his process.

Much uneasiness is caused to photographers by the law treating photographs as engravings and lithographs, and requiring that specimens should be deposited with the authorities, as in the case of other works of art. It seems to be impossible to avoid this extension of the law, but its application will be attended with many difficulties, for the majority of private portraits taken cannot be considered as publications, and it will be scarcely possible to bring them under that category.

Our photographers are bringing forward much evidence to show that Woodward's solar camera is not new. M. Quinet claimed the priority in adopting the principle upon which that instrument is constructed. Many years ago he also claimed the invention of the orthoscopic lens; but M. Bertsch reminded the society that this form of combination was in use before the date claimed by M. Quinet—that he and M. Le Gray had experimented with it without thinking it necessary to claim priority of invention. M. Quinet patented in 1852 an apparatus answering the purpose of Woodward's solar camera. This apparatus is vertical: it is composed of a parabolic reflector projecting light from the sky, or from a lamp, upon the glass plate, and of an optical combination, intended to throw an enlarged image of the original upon a sensitive plate.

M. Bertsch remarked that there was nothing new either in M. Quinet's or Mr. Woodward's mode of lighting, nor in the principle or construction of their cameras. The solar microscope, invented in 1738 by Nathaniel Lieberkuhn, of Berlin, and improved by Cuff, Appinus, Baker, and Chevalier, differed from these *new* apparatus only in dimensions: the amplifying apparatus and material arrangement are the same in each. As to its applications, the portraits exhibited by M. Tournachon, jun., and those of Dr. Gontier, presented to the *Académie* in 1849, established the fact that they are by no means recent.

J. P.

Correspondence.

ASSAYING SILVER AND GOLD RESIDUES.

To the Editor.

Sir,—Since writing to you on the subject of economising alkaline chloride of gold toning baths, I have been asked whether the reduced material might be reconverted into chloride of gold without the trouble of fusing it into a button? It would undoubtedly be easy to purify it by simply pulverising, and digesting for half an hour or so in commercial muriatic acid diluted with an equal bulk of water. This hydrochloric acid is so cheap a substance, that it is not necessary for me to fix the minimum quantity which would suffice. The best plan would be to add enough in the first instance to cover the powder to the depth of half an inch, and after a quarter of an hour's digestion to pour it off and put in a fresh quantity. The gold is insoluble in hydrochloric acid; but the whole of the carbonate and oxide of iron dissolves, forming a yellow liquid, which is a mixture of proto and perchloride of iron. When the hydrochloric acid last added ceases to assume a strong yellow colour, the iron is all separated, and it remains only to mix nitric acid and hydrochloric acid in the proportions for *aqua regia*, and to dissolve the gold by a gentle heat. This part of the process has been sufficiently described in the back numbers of your Journal—the mode of separating the iron from the gold being the point to which the question referred.

A correspondent has sent to me packets containing dried sulphide of silver, and also ashes from sensitive paper. Of the former he has collected a large quantity, many pounds in weight, by systematically precipitating his old fixing baths with sulphide of potassium, supplied to him for that purpose by the operative chemist. I see it stated in a contemporary publication, that in France they deal with dried sulphide of silver by simply deflagrating it with nitrate of potash. This process certainly answers the purpose, and is so easily performed that it might be done in the dining room, or at all events over the kitchen fire. All that is necessary is to rub up the black sulphide in a Wedgwood mortar, with twice its weight of nitre, and having placed a clay crucible on the hot coals, to throw the powder into it, a little at a time. It is not necessary that the crucible should be red hot, since when the action has once been started the heat is maintained by the deflagration. Free sulphur, if present, burns away with a blue flame, and the sulphur contained in the sulphide is oxidised by the nitre into sulphuric acid, and remains combined with potash in the form of sulphate. It might be anticipated that the silver would be left behind as an oxide of silver; but the affinity of silver for oxygen is so slight, that no formation of this compound takes place at a high temperature, and the reduction is complete. When the combustion is over, the crucible is allowed to cool, and boiling water is then poured into it, which dissolves out all the potash salts, and leaves a fine network of metallic silver. This may be afterwards run into a button by sufficiently raising the heat.

By operating as above described upon one hundred grains of the black powder sent to me, I obtained forty-eight grains of metal; and on dissolving the button in pure dilute nitric acid a powder remained, which after ignition weighed 1·3 grains, and consisted of pure gold. The presence of so large a quantity of gold in the silver is explained by the fact that the precipitated sulphide of silver was obtained from hyposulphite solution which had been used both for toning and fixing, according to the old method. And I may take this opportunity of mentioning that when such is the case, it is important to add only just enough of the sulphide of potassium to throw down the whole of the silver; since, if any excess be permitted, the gold will be taken up again in the form of a double sulphide of gold and potassium.

Your readers will observe that the quantity of real silver in the black powder, viz., 48 per cent., was less than might have been anticipated. Pure sulphide of silver contains at least 87 per cent. of metal: so that it is probable that the residue was not perfectly dry, and also that it contained uncombined sulphur, and organic matter.

The ashes of the paper were treated in the same manner as the sulphide; but it occurred to me at first that a little carbonate of potash or soda would be needed as a flux for the chloride of silver. Experiment showed, however, that nothing of the sort was necessary, and that deflagration with an equal weight of nitre left the silver in a metallic form:

in fact, as the ashes of the paper contained unburned carbon, carbonate of potash was formed during the deflagration. The metallic silver obtained from one hundred grains of the ashes weighed rather more than sixty-six grains.—I am, yours, &c.,

King's College, Feb. 22, 1860. F. HARDWICH.

ROCK INSCRIPTIONS WANTED!

To the Editor.

Sir,—In the concluding paragraph of No. 13 of the "Notes of a Photographic Tour in the Holy Land," the dashing author looks forward with anxious interest to the next batch of Photographic Journals.

I beg to suggest that the publisher should inclose a *Bible* in the parcel, and draw the attention of the sprightly author, and his friend "John," to the seventeenth chapter of the First Book of Kings, in connexion with page 50 of the Journal for February 15th.

Although he says very little of the pictures that he has taken, they will, no doubt, be exhibited on his return; and I hope to see one of that most interesting relic, the barrel of meal, or the cruse of oil, which Elijah GAVE to the widow of Zarephath. The history does not make mention of the caravan of camels, loaded with flour and oil, which accompanied the prophet from the brook Cherith; but your lively friend may have met with some traditionary account of, perhaps, rock inscription relating the circumstance.

A photograph of such an inscription would be invaluable. It would not merely furnish a *facsimilé* for the Journal, but could not fail to draw in its train an incalculable amount of learned correspondence.

I am, yours, &c.,

A CONSTANT READER OF YOUR EXCELLENT JOURNAL.

P.S.—The tourist should have been furnished with one of Mr. Skaif's pistol cameras, which would have served quite as well as a revolver, to frighten robbers; and we should then have had an *authentic* picture of the chief, taken in the act of falling from his horse at the sight of a pistol barrel: the countenance and general expression would have been a study for painters.

VARYING THE FOCUS OF A PORTRAIT COMBINATION.

To the Editor.

Sir,—Although but little acquainted with optical matters, I read with much interest Mr. Grubb's excellent paper "On the Optical Centre" of compound lenses, in No. 112 of your Journal, and, in doing so, an idea struck me, that the result of his demonstrations, when completed, may enable photographers who cannot afford large and expensive lenses to see a way of altering their small ones, by the *substitution of a longer focus back lens*, to get larger pictures when they may want them. Lengthening the focus of their combinations, and, consequently, enlarging the size of their pictures without enlarging the aperture of their lens, would, of course, make it slower; but would the practical effect be to injuriously affect the quality of the photographic impression on the sensitised plate? and, if so, in what way? Perhaps you, or some of your readers, will be kind enough to answer this query in the Journal, and thus oblige, VERDANT GREEN, AND MANY MORE.

Aberdeen, 21st February, 1860.

[The plan suggested is not practically available, because the cost would be nearly as great as for making a new entire lens, while the result would be very inferior.

There are, however, two methods already in use that meet the desideratum to some extent:—first, the substitution of an achromatic *concave* for the back lens of the combination, thus converting it into an "orthoscopic;" and, second, the introduction of a smaller achromatised concave *between* the existing lenses, as first practised by Mr. Archer, and at present in common use in Derogy's lenses. This latter arrangement is the one which we think will meet the requirements mentioned in your private note.—Ed.]

SATURDAY HALF-HOLIDAY.

To the Editor.

Sir,—When an Englishman has a grievance he writes to *The Times:* when photographers are in difficulties they write to The British Journal of Photography, and the courteous editor answers all their inquiries, and sets them right.

Now, sir, I, in common with many photographic operators, have a grievance. It is this:—my health is in danger, from constant confinement in the operating room, in an atmosphere almost saturated with ether, and loaded with the gases common to such places, and this, too, all the year round, nine or ten hours a day, without change of scene or the slightest variation in the routine. Do you wonder, sir, that, under such circumstances, photographs are not always artistic?

My object in writing to you is this:—to obtain your advocacy for the Saturday or weekly half-holiday for the operators of the city. The advantages both to employer and employed are so obvious as to need no argument; and I think a few words from you would accomplish a work for which you would deserve and receive the everlasting gratitude of all connected with our art. I inclose my name for your private satisfaction, and beg to subscribe myself AN OVER-WORKED OPERATOR.

London, February 10, 1860.

[We quite concur in the advisability of the movement here advocated. We know well the depressing effect arising from constantly inhaling the fumes of ether, to say nothing of the prussic acid from the cyanide of potassium.

We have no doubt that a weekly half-holiday would be a real advantage in the long run to both employers and employed. The particular day selected is of no consequence: let that day be chosen that is generally found to be least occupied. We verily believe that all would be gainers by the arrangement.—Ed.]

PRESERVATIVE CASES FOR POSITIVE PAPER.

To the Editor.

Sir,—I inclose a scrap of paper, which was printed on Saturday last, the 11th inst., and which was sensitised on the 12th October last. It is part of a lot put in one of my preservative cases at the last mentioned date. The print contains no pure whites, but the colour of the back affords good evidence of keeping.—I am, yours, &c.,

Glasgow, 13th February, 1860. WM. CHURCH, Jun.

[The print sent is as perfect as if the albumenised paper had been used within a few hours from the time of sensitising, instead of being kept for nearly *four months*. There is not a vestige of discolouration.—Ed.]

WAXED-PAPER PROCESS.

To the Editor.

Sir,—Having some idea of commencing the waxed-paper process, which is, I think, the most convenient one for a traveller, would you be kind enough to inform me, in your next issue, what is the best work on that process, and likewise whether it is one in which I am likely to succeed?—I am, yours, &c., S. M.

Liverpool, Feb. 20, 1860.

[We have read with much pleasure a little pamphlet on the waxed-paper process, translated from the French, by Mr. How, and published by Knight & Co., of Foster Lane. The formulæ there given will undoubtedly produce pictures of a superior quality, and we think you could not do better than give it a careful trial.—Ed.]

ANSWERS TO CORRESPONDENTS.

Amateur (Leeds).—A single combination.

C. B.—Consult our replies in No. 110.

A——m.—Aqua regia is a mixture of hydrochloride and nitric acids.

S. M. S.—India rubber solution is a capital vehicle for mounting your proofs.

Beatus.—"Contentment is better than riches." Need we say more?

Simplex.—You have spoiled your toning bath. Let well alone in future.

M. A.—It is probable that you used *hard* water. Take boiled rain, if you cannot procure distilled, water next time.

Newton.—Save all your washings containing nitrate of silver of course, and convert the solution into chloride by the addition of a solution of common salt.

Timon.—Why not apply to the secretary? He will most probably be able to find some one who knows you personally.

T. A. P.—Murray & Heath, Piccadilly, London, have lately introduced a very handy portable sink for a tent or developing box.

Sam.—Apply for a price list, enclosing a penny stamp, and you will get the information sought.

Mary J——.—You can procure gloves of india rubber, and then you need not fear to stain your fingers. See reply to "Enquirer."

Enquirer.—We have ascertained that the gauntlets about which you enquired are to be had at No. 58, Charing Cross, London.

T. M. (Manchester).—A four-inch landscape lens would be too large. One of two and a quarter or two and a half inches diameter would be ample.

Brisbane.—We have great hopes of the process recently introduced by M. Poitevin. We hope to have more to communicate thereon in a future number.

S. N. M. (Bembridge).—We are not quite certain that we have interpreted your initials correctly. Apply to Frith & Hayward, Reigate, and we have *no* doubt that your want will be supplied.

George Haydon.—We have never before heard of such an instrument as you describe: had we done so and noticed it, we should have done so simply to point out its absurdity. It is *impossible* to obtain stereoscopic effects from *single* pictures.

T. R.—We think if you were to work upon paper prepared as indicated in some of Dr. Maddox's recent communications, you would accomplish your object. Send a stamped directed envelope, and we will enclose you a specimen received from that gentleman.

Bosh! (Reigate).—Your signature is a little obscure, but looks like what we have given. Your proposed communication would scarcely be appropriate to *our* columns. Try the contemporary you quote.

S— W—.—You ought to have known better than to fall into such a palpable trap. Valuable recipes are not given for a few postage stamps. The amount laid out in a good manual would have supplied you with a dozen far better than that you have received.

Amateur (London).—The sum you have named is not much more than half what would be requisite to procure *the best*, but you will get very good of any of the makers you have mentioned. Perhaps the *third* on your list will answer your purpose best; we have frequently purchased articles of that dealer, and found them good.

Stereographs.—We have several sets of these productions to notice, and beg the kind indulgence of the artists for our delay, which has arisen partly from want of space, but chiefly from a serious attack of illness, which precluded the possibility of working at so laborious an occupation.

Rev. T. K.—We fear that some of the back numbers to which you allude are now out of print. The toning processes mentioned are to be found at pages 4, 74, 175, and 282 of our last volume. We cannot, however, meet your views better than by referring you to an excellent paper by Mr. Hughes on the subject about which you inquire, which paper appears in the present number.

Received.—J. Jones, W. R., B. F.

*** Again a plethora of matter compels us to leave over numerous interesting articles in type, among which are a Notice of the Architectural Photographic Association's Exhibition, and "Notes of a Photographic Tour in the Holy Land. No. XIV."

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 114, Vol. VII.—MARCH 15, 1860.

In a recent report of a meeting of the Birmingham Photographic Society, it is recorded that Mr. Osborn mentioned the singular fact that a dry sensitised-collodionised plate, prepared by Dr. Hill Norris's process, after having been exposed to light, could be restored to a sensitive condition by being submitted to the action of the vapour of acetic acid. We do not perceive the *rationale* of the phenomenon; but that the fact is as stated we have no doubt, seeing that we have also the corroborative evidence of Mr. Hardwich, who at our request kindly tested the point. We should be glad, however, to learn from Mr. Osborn whether he has found the operation practically useful, as Mr. Hardwich is scarcely impressed with the idea of its being so, having found a plate thus treated to require a long exposure for the second latent impression, and also to develope with an immense number of minute transparent spots, which were not found on plates prepared at the same time, and with the same collodion, but not acted upon by the acetic acid. It is a matter that, in our opinion, certainly deserves further investigation: there are few well-established phenomena which cannot be turned to some account.

We find that the time has arrived when it has become requisite for us to make a few comments upon a lens that has been for some months before the public, and upon which we have hitherto maintained a strict silence. The objective to which we allude is that named by its inventor, Mr. Sutton, of Jersey, the *Panoramic Lens;* and our abstinence from any earlier notice of it will be readily understood by those of our readers who have observed the insults to which we have been subjected by that individual in his capacity as editor of a contemporary publication—insults so gross that we have not deemed them worthy of remark, and to which we should not even now have made any allusion but as accounting for our apparent neglect of a matter that might be considered as of interest to photographers generally. All those who are acquainted with us personally, and many more who know us only by reputation, will be aware that the above-named considerations are not likely to influence us in the smallest degree in rendering what we believe to be strict justice in any observations that we find it necessary to make. Without further preface, therefore, we proceed to lay before our readers such particulars as we have gathered, and to express, in reply to several inquiries that we have received, such opinions as we entertain with regard to the lens in question.

The panoramic lens, which we have inspected at the establishment of the authorised manufacturer, Mr. Cox, of Skinner Street, Snowhill, and more recently at a meeting of the Photographic Society, consists of a sphere of glass made in two hemispheres, with a water-tight fitting, and having a centrical spherical hollow space which, when the lens is in use, is filled with distilled water—thus forming a sphere of water within the sphere of glass, both having a common centre, the diameters of the two spheres being approximately as about one to two—that is to say, the glass being two inches in diameter has a central aperture of about one inch. The whole of the central opening is not, however, employed as the aperture of the lens: the water-tight fitting, before mentioned, projecting into the water, is made to act as a diaphragm, which reduces the aperture to a little more than three-eighths of an inch; and in addition to this an arrangement is introduced, which is termed by the inventor an *equalising stop*, and which consists of three or five plates radiating towards the centre of the combination, but leaving the centre unimpeded, the object of which is to equalise the amount of light transmitted by the lens, whether the rays pass through it perpendicularly or obliquely to the diaphragm.

It will of course be perceived that, by the arrangement above described, the axis of all pencils of rays, whether oblique or not, pass through the centre of the combination, and that the foci of very distant objects are situated on a spherical surface, having the centre of the lens also for its centre.

The angular extent of field intended to be covered is 120 degrees; but, inasmuch as such an extent would be totally useless in one of the two directions — that is, vertically—and that a surface of such extent of a spherical form would be inapplicable for any useful purpose, the inventor of the lens has substituted for a segment of a narrow spherical zone one of a cylindrical form, trusting that the more general proximity of objects in the foreground of a subject to be delineated will (by their posterior conjugate foci being thus necessarily farther removed from the lens than those of the distant objects falling centrically) compensate for the departure from the strict theoretical form of surface upon which the sensitive film should be found. It consequently follows that the plates upon which negatives are taken by the panoramic lens must be bent into the form of *one-third part* of a cylindrical zone, the dimensions being 6 × 15 in., or in about that proportion.

We believe that the preceding description includes all the peculiarities of the lens: the camera and other apparatus are of course modified to suit the requirements of the lens, that is to say, with backs to receive curved plates, and with baths and cleaning boards, printing-frames, &c., of a like character.

So far as we are aware the lens thus constructed is novel: it is certainly ingenious—the equalising stop especially so, and unquestionably does credit to the inventive faculties of its projector. It is therefore by no means surprising that he should expect great things from it—that he should regard it with a sanguine eye—be "to its faults a little blind"—and vaunt its qualifications in language not a little hyperbolical. All this is very natural, and we will therefore refrain altogether from criticising too closely the assertions made in the enthusiasm of the moment.

We fear, however, that instead of the panoramic lens being destined to supersede every other lens at present in use, as its projector so fondly imagines, on the contrary, its employment will be of a very limited character, and we shall of course adduce our reasons for arriving at this conclusion. We may first, however, remark, that we have seen the specimen print forwarded by Mr. Sutton to Dr. Diamond, and also very narrowly scrutinised the negative itself, which latter, he says,

is *as good as he can produce with the panoramic lens.* We are quite ready to admit that the print alluded to *does not do justice to the negative*, and that a much better one might be obtained from it. Having said this much, we now proceed to remark upon the negative. This we find but moderately sharp even for distant objects, and that only in about the central *third part of the negative*, which does not therefore exceed an angle of 40 degrees, the two lateral third parts being not in good focus, while the bulk of the foreground is very indistinct and quite out of focus. A very little consideration would of course lead us to expect that this should be the case; for not only does the correction for spherical aberration appear to be limited to reducing greatly the effective aperture, but *there is no provision whatever for focussing:* only those objects that are beyond a certain distance in front of the lens can be in tolerably correct focus for the central zone, while every other part must be delineated just as chance directs. It is contended by the patentee, that a portion of any subject, with ordinary lenses, must be out of focus more or less. This is true; but when a plane is the surface of delineation, the operator *has the choice* as to what part he shall focus upon specially,—and a most important point it is upon which to exercise the judgment.

The next feature to which we turn our attention is the asserted absolute freedom from distortion claimed for the performance of this lens. On this point we refer to another article in the present number, on "Perspective and Distortion;" and we will merely remark, that had only a tolerable "panoramic effect" been claimed, we should not have thought it necessary to point out the defect that undoubtedly exists as regards distortion.

The plates of glass employed with each lens must be bent to one particular curve, and this requirement, apart from any difficulties of manipulation—which by the way Mr. Sutton says do not exist—is such a formidable obstacle to the general adoption of the panoramic lens, that few persons would be likely to encounter it. Not only would the cost of glass be enormously increased, but the difficulty of obtaining a supply, under most circumstances, would deter many from adopting the curved plates.

The difficulties of coating curved plates, &c., are not only made light of, but absolutely ignored. We think that here Mr. Sutton will perceive his error on reflection; for he cannot seriously mean to assert that it is not more difficult to coat a cylindrical surface properly than a plane one. To ignore difficulties is not a promising way of conquering them; and it is not enough to say "that it can readily be done by using alcoholic collodion." Whatever may be the relative merits of ordinary and alcoholic collodion, it is not an easy thing to make any experienced photographer abandon the collodion with which he has been used to work.

We are convinced that there is increased difficulty in all the operations of cleaning the plates, coating them with collodion, developing and printing from them — reasons quite sufficient, particularly when taken with others previously mentioned, to prevent the bulk of photographers from casting aside their existing lenses in favour of this new one. Could it be shown that the real advantages were such as are so ostentatiously claimed, some photographers doubtless would take the trouble to conquer the manipulative difficulties; but, even then, we are of opinion that they would form but a small minority. In conclusion, we have again to remark that, while we fully appreciate the ingenuity of the contrivance, we consider that it is not destined to effect the revolution contemplated by its contriver.

It is with much pleasure that we feel called upon to announce the successful formation of a new Photographic Society in Scotland, a report of the first ordinary meeting of which will be found in the usual division of our present number, under the name adopted by the promoters—"The City of Glasgow and West of Scotland Photographic Society."

We are able sincerely to congratulate the members upon their very judicious selection of a President in the person of Mr. Kibble, a gentleman who possesses theoretical as well as practical acquaintance with the details of our art in no common degree; and we have much satisfaction in recognising several of the names amongst those of the office-bearers and council. The new society has our best wishes for a prosperous and useful career.

PERSPECTIVE AND DISTORTION.

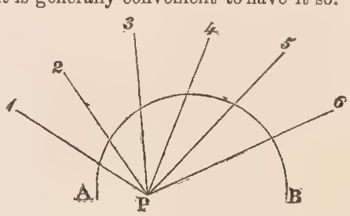
By Thomas Grubb, M.R.I.A.

It occurs to me that a short chapter on perspective may not be without its use at the present moment. I do not say that a long one would not be useful: there are some points in perspective which ought to be better understood. For the present, having a definite point in view, I shall, in progressing towards the same, avoid, so far as practicable, all complicated questions.

A picture (by which general term I propose to indicate an outline drawing, a finished painting, a photograph, &c.) can, strictly speaking, give a correct perspective view of a subject only from one point of sight; and for ordinary cases the plane or flat surface is at once the most convenient and desirable for adoption, having, together with other advantages, this important one, viz., that it is the one which produces a minimum amount of distortion for a given amount of displacement of the eye from the point of sight. In other words, pictures in general (I exclude, for example, such as necessarily embrace a circle round the spectator) suffer less distortion by the displacement of the eye from the true point of sight if projected upon a plane surface rather than upon any other which can be devised. Hence the general adoption of the plane whenever such is practicable.

Calling the preceding my first proposition, my second is capable of much easier proof, while it in no respect depends upon the first for its correctness. It is as follows:—

That a correct perspective picture can be produced for a given point of sight upon a surface of any form, provided such surface do not *return within itself* (or overlap) to the eye at the point of sight. Thus, the surface of representation may be flat, spherical, cylindrical, or irregular. Moreover, it is not required that the point of sight shall be symmetrical with the surface of delineation, though it is generally convenient to have it so. This is shown in Fig. 1,



where the curved line A B represents indifferently a section of a cylindric or spherical surface of delineation (which we shall suppose to be transparent and non-refracting); P the point of sight which is here placed neither in the axis of, or in any way symmetric with A B.; 1 P, 2 P, &c., rays proceeding from the several points of a distant object through the transparent medium A B to the point P. Now, if we suppose that the several rays 1 P, 2 P, &c., in passing through the medium A B, leave each their impression thereon, then an eye placed at P would find the images (so impressed) to coincide in direction with the respective parts of the object, and, *ergo*, to form a true perspective delineation of the same; for that which forms an outline on the retina of the eye perfectly similar to that of the original object must give a true perspective thereof, and this is effected under the circumstances described, *irrespective of the shape* of the medium or surface A B.

My next proposition is simply the converse of the preceding, viz., that having obtained a correct perspective delineation on a curved surface (whether by drawing, photography, &c.,) for any assumed position or distance of P (the point of sight), the same will *not* give a correct perspective to an eye placed at any other point, while the greater (*i.e.* the deeper) the curvature of the surface of delineation, the greater will the distortion be for any given amount of displacement of the eye from the true point of sight. It is probably unnecessary to stop to prove the correctness of this.

We have now arrived pretty close to the point which it is the more immediate object of this communication to treat on. I may of course be in error as to the opinion generally held with regard to this point; but it would appear from what has been lately put forward, as also from individual opinion privately expressed, that a very general error prevails with respect to it. In short, it would seem that a general impression exists that if we

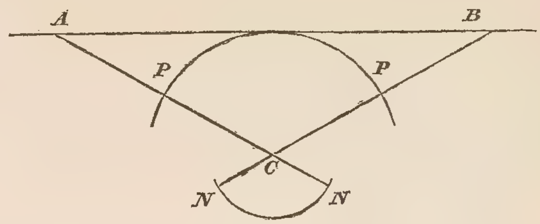
project or delineate, graphically or photographically, upon the surface of a cylindric segment a subject, in such manner that to an eye placed at some point in the axis of the cylinder the picture affords to the eye a true perspective of the original, we may either by unfolding (flattening out) the cylindric segment, or by copying from the cylindric picture and flattening out the copy, produce a picture which, in this its flattened state, will give a true perspective of the original to an eye placed at some definite point in front of the same.

Let it not be supposed that I am going to be over-precise or over-nice here. Where the *angle of view* is small, say 30 or, perhaps, 40 degrees — that is to say, 15 to 20 degrees on each side of the axis (or centre of the picture) — we may convert the surface on which a picture is depicted from a cylindric or spherical surface of *moderate* curvature to a plane, or reverse these operations, without incurring any serious amount of distortion; but a proposal having lately been made, as I understand, to take pictures (photographs) on a cylindric segment of 120 degrees, and to obtain from these, by photographic means, pictures upon a plane free from distortion, it becomes a matter of some interest to investigate the practicability of the proposal.

In our present state of knowledge there appear to be just two ways in which the most sanguine imagination can hope to accomplish this:— one by the aid of a lens; the other by the process of ordinary photographic printing.

Commencing with the consideration of the former, I shall suppose that, having procured a panoramic lens of, say eight inches focus, with the required curved glasses, &c., we obtain a curved negative, including an *angle of view* of 120 degrees; and that we next proceed to copy this negative by the aid of (of course) a panoramic lens, in the proportion of two to one, *on a flat surface.* The first thing which must here strike us is, that our eight-inch lens will not effect this; in fact a copying lens is required for each proportion of original and copy. In the case assumed, the focus (principal) of the copying lens must be five and one-third inches, which will give conjugate foci of eight and sixteen inches, as required. This second lens being procured and placed in the axis of the cylindric negative, would afford a picture or image of the same in the required proportion of two to one, but, unfortunately for the scheme, *only on a curved surface of the proportionate radius* (here of sixteen inches). This is

FIG. 2.



shown in Fig. 2, where C is the centre of the lens, NN section of the curved negative, PP section of the segment on which the lens would form an image of N N; while to form a distinct image on the plane indicated by the line A B, the lens should be at once five and one-third inches focus for the central rays, and six and four-tenth inches focus for the extreme lateral ones. I need hardly say that to suppose such a lens as possible of construction is too absurd to be entertained for a moment; while if we attempt to *accommodate matters* by placing the copying lens *out of* the centre of curvature of the curved negative, we get a bravely-distorted picture.

To sum up the resources of copying by the lens —

1. We may obtain a picture on a flat surface free from distortion, but unbearably indistinct.
2. We may obtain a picture (also) on a flat surface tolerably* distinct, but greatly distorted.
3. We may produce (but only on surfaces the curvature of which is in strict accordance with the circumstances) pictures similar in size, outline, and projection, to what would be obtained on similarly curved surfaces by using, in the first instance, a lens of the required focus.

And of these three resources I shall here observe that while the first and second appear to be of no practical use, the third places us no nearer than we were without it to the obtaining of a true perspective picture on a flat surface.

Turning now to the consideration of the second proposed method, viz., that of copying from the cylindric negative by the ordinary photographic printing process, the investigation of which is the chief end of this communication, I shall best explain my view of the inevitable result by the aid of a triple diagram.

FIG. 3.

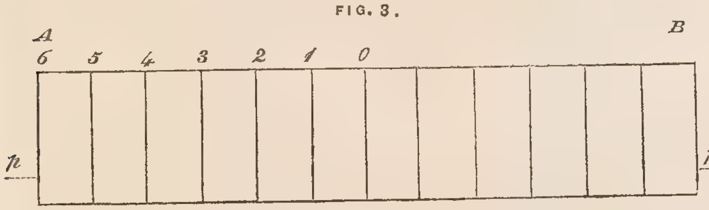


Fig. 3 represents an undistorted front view of a long range of building, divided, vertically, into equal spaces, by lines numbered from the centre (*o*) towards either end, *p p* representing the height of the line of sight.

FIG. 4.

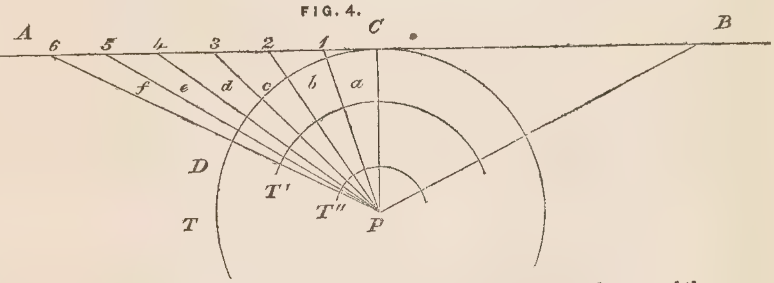


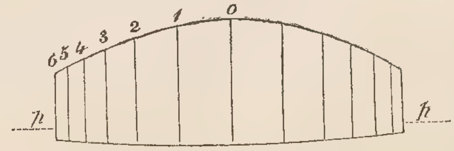
Fig. 4 is a ground plan or section of the same through the horizontal plane of sight (fig. 3, *p p*).

The line A C B corresponds in length with Fig. 3, and is similarly divided and numbered. P is the point of sight, placed centrally opposite to A B, and to which A B subtends 60 degrees on either side of the perpendicular P C.

Let the line A C B be also considered as representing the position of a transparent vertical plane, through which the building (Fig. 3) is seen from the point P, and let T T′ T″ represent the position of several transparent cylindric surfaces, placed vertically, and with their axes coinciding, with the point P.

Then will the several diagonal lines or secants *a b c*, &c., in their contacts with the transparent plane A C B, and with the several concentric segments T T′ T″, show the respective places where corresponding points will be found for each of these surfaces. It is perhaps unnecessary to mention that the several cylindric segments being placed concentric, the projection on any one will be the same, except in size, with the rest. Selecting then that segment which touches the transparent plane at C, we find from the diagram that, while equal horizontal spaces (in the object) are indicated on the plane A B by equal spaces, the same are, on the segment C D, indicated by spaces widely differing. In short, we substitute, in using the cylindric projection, the *arcs* of the several triangles C P 1, C P 2, &c., for their tangents C 1, C 2, &c.

FIG. 5.



* Only a narrow horizontal band can, under any circumstances, be expected to be distinct.

These arcs are represented in due proportion by the vertical lines 0 to 6, Fig. 5. To complete the projection we must now find the lengths for these several lines, above and below the line of sight.

Vertical lines (in the object) being represented in both the plane and cylindric projections by vertical lines, we have a law common to both cases for ascertaining their length, viz.:—

Multiply the height of the object by the fraction which represents the proportion which the distance of the surface of representation from the centre P bears to the distance of the object from the same, or

$$h = H \times \frac{d}{D}$$

For example: suppose the height of the object to be 400 inches, the central distance — viz., from P to C, Fig. 5 — 800 inches, and from P to the transparent surface 8 inches, then

$$h = 400 \times \frac{8}{800}$$
$$= 4 \text{ inches}$$

Taking for another example the extreme point of the object (subtending 60 degrees to the vertical P C), we find its distance to be *double* that of P C; so that

$$h = 400 \times \frac{8}{1600}$$
$$= 2 \text{ inches}$$

and by calculating the lengths of the remaining five lines of our diagram, we obtain the projection shown at Fig. 4.

It will be seen that I have treated this part of the subject independent of the presence of a lens; but it may also be seen that, provided the lens (as stated of the panoramic) converges the rays without deflecting the pencils, then it is perfectly immaterial to the accuracy of our deductions whether the investigation is conducted by considering the several axial rays as they pass through a surface before arriving at the centre P, or as they pass through the same surface similarly placed behind P, and after having passed through the same.

In order that the photographer may understand what he may expect in the way of perfection or distortion by adopting a certain course, I recommend a comparison of Figs. 3 and 4. Let him suppose that, desiring to take an undistorted view of a building or range of buildings, the length and height, &c., of which are in proportion to the diagram Fig. 3, he takes a negative (the object subtending an angle of 120 degrees) on a cylindric surface, and then having printed a positive from the same by superposition, he unfolds or flattens out the positive. Now, Fig. 3 being assumed to be an undistorted view of the object, Fig. 4 is the *panoramic*.

Since writing the foregoing, a case has occured to me which affords a striking illustration of the effect of changing the figure of a surface of representation, on which a perspective delineation had previously been impressed.

A picture of the interior of a *circular building* being projected upon a cylindric surface from a point of sight in its axis—the centres of curvature and point of sight being all symmetric — this picture, on being unfolded or flattened into a plane, will be a true perspective front, or direct view of a *perfectly straight line range of building;* and (conversely) if we project upon a plane a true perspective front view of a long *straight* range of building, and bend it into a cylindric segment, it will, to an eye placed in the centre of curvature, and in the original plane of sight, present the effect and true perspective of a *cylindric* interior. This rather striking metamorphosis, which I am not aware of having been previously noticed, may prove, on occasion, of essential help to the artist; but I mention it here chiefly as being one of the many proofs which can be adduced of the absurdity of assuming that what is true perspective on a cylinder viewed from a definite point, is when unfolded, a true perspective of the same subject viewed on a plane.

ON THE MANUFACTURE OF PHOTOGRAPHIC COLLODION.

By T. F. Hardwich.

[Read at the Meeting of the London Photographic Society, 6th March, 1860.]

The manufacture of photographic collodion could not be described in a paper of the ordinary length, without omitting many important points, and treating others in a superficial manner. I am, therefore, compelled to make a demand upon your patience, but will do all that lies in my power to assist the comprehension of the subject, by dividing it into separate portions. To commence, then, with the chemicals which are used in the manufacture of collodion.

1. *The Cotton.*—For sometime after I began this process, I purchased cotton of Messrs. Hutton & Co., of No. 6, Newgate Street, City, without knowing anything of its manufacture, excepting that it was the finest quality procurable, and cost two shillings per pound. Afterwards, however, I thought it better to procure a variety of samples of cotton wool of different growths, which I was enabled to do by the assistance of a friend, who sent some fourteen or fifteen packets, grown in America, Madras, South Sea Islands, &c., and ranging in price from fourpence halfpenny to fourteen pence per pound. Having prepared the nitrosulphuric acid in the manner presently to be indicated, and found by trying it with the ordinary cotton that it was of the correct strength, I divided it out into equal measures, and immersed about nine or ten of the most characteristic of the cottons. The result was a failure in every case, the material being in a great measure dissolved by the acid. None of these cottons had undergone any cleansing, and therefore, although many of them appeared sufficiently white and pure, it appeared desirable to try the effect of boiling in a weak alkaline ley. The process proved more successful than I anticipated, and enabled me to prepare pyroxyline from a sample of cotton which was otherwise immediately disintegrated and reduced to pulp by the action of the acid. Evidently the cotton fibre is encased by a film of some resin, which the alkali converts into a soap, and removes in a soluble form. Supposing this resin to be left upon the cotton, it resists for a little time the action of the nitrosulphuric acid, and much squeezing with the glass rods is required to wet the cotton and make it imbibe the fluid: bubbles of air are entangled at first, and cannot easily be expelled, but almost immediately afterwards an evolution of red fumes takes place, and the fibre is destroyed by oxidation. On the other hand, with the cotton which has been previously treated with dilute potash, there is no difficulty whatever in making it absorb the acid; it sucks up the liquid like a sponge, and remains nearly unaltered in appearance during the whole time of the digestion.

I cannot say that I have invariably pursued the plan of cleansing the commercial cotton wool by boiling in a weak alkali, since I was not at first aware of the importance of so doing. When, however, I observed the effect of the potash upon the raw material, I at once applied it to the commercial cotton, and with manifest advantage, for I now obtain at least fifteen per cent. more in weight of pyroxyline, and secure greater uniformity in every other respect. Even from the finest qualities of the wool, traces of soluble matter are extracted by potash, sufficient to impart a strong yellow colour to the alkaline liquid, and which, if permitted to remain, would deoxidise that portion of the nitric acid immediately in contact with the fibre, and so far weaken it as to insure the immediate solution of a part of the cotton.

It is always desirable to simplify a chemical process, when it can be done with impunity; but at present I am disposed to recommend this alkaline treatment of the cotton, since in purchasing the finest qualities previously, in quantities of twelve pounds at a time, I did not find them to correspond, which I now think may have been due to the greater or less perfection of the cleansing process; and without doubt the percentage gain in weight on converting the cotton into pyroxyline, has been greater and more uniform since the preliminary treatment with a dilute alkali was adopted.

The cotton which I use is of American growth, but not always from the same State, since it appears that the manufacturer is guided, in making his purchases, by the varying price of the market. This cotton is sent out in packets of one pound each, which I divide into quarters, and boil each quarter gently for two hours, in a solution of two ounces of potash (at 2s. 6d. per pound) to a gallon of water. The mass is then lifted out, and well squeezed in repeated changes of water for about twenty minutes, after which it is spread out to dry. The assistant to whom this preliminary part of the process is intrusted receives full directions to remove the whole of the potash, and to disturb the fibre of the cotton as little as possible, since if it become knotted and twisted the action of the nitric acid will be interfered with.

It may, perhaps, be suggested that the potash is likely to exercise a chemical or modifying action on the fibre of the cotton; but I do not think that it has any such effect when used in dilute solution, and for a comparatively short time, as I advise. I formerly believed that a prolonged digestion in a somewhat stronger potash might by degrees affect the cellulose, and produce more or less of that condition which we see in old and rotten calico, as compared with the new material; but there need be no apprehension of this in the process above described, because cotton fabrics which have been weakened by wear and repeated washings become more easily soluble in nitrosulphuric acid; whereas the cotton wool, by boiling in weak alkali, is rendered less soluble in the acids. I think it right, however, to mention that the use of the potash is a recent improvement, none of the collodion tested by the committee having been prepared from cotton so treated.

2. *The Sulphuric Acid.*—I have not derived any advantage from using the pure sulphuric acid, but have found the commercial acid sufficiently good for the purpose. The strength is a little variable, and therefore it is better to take the specific gravity of several samples, and to select the strongest. Sulphate of lead and bisulphate of potash are mentioned as impurities of commercial oil of vitriol; but I never detect the latter in any samples which are sent to me, and very seldom the former; from which I infer that the great and increasing demand for oil of vitriol in the arts has led to a gradual improvement in its manufacture. Traces of nitric acid are usually present in the commercial acid, but not to an extent likely to interfere with the preparation of pyroxyline.

3. *The Nitric Acid.*—I have been asked why I recommend so strong a nitric acid as that of sp. gr. 1·45, seeing that the acid is afterwards to be so greatly diluted with water. There are two reasons for so doing: first, because this acid is cheaper after the rate, and perhaps more uniform than a weaker acid; and, secondly, it is important that both the sulphuric and nitric acid should be as strong as possible, in order to allow of the use of sufficient water to raise the temperature on mixing at once to the proper point, and so to obviate the necessity of employing artificial heat.

A saving of expense is effected by using the yellow acid, sold in commerce as "acid nitros," in place of the pure acid of equal strength; and for some time I was of opinion that this might be done with impunity: it subsequently appeared, however, that the quantity of chlorine in the "nitros acid" is more valuable than I imagined; and on inquiry I find that it must necessarily remain so, inasmuch as the cargoes of nitrate of soda, from which the acid is made, differ in quality, and no preliminary process of purification is resorted to, with the view of eliminating the chloride. The effect of chlorine, when present in the nitric acid in more than a certain proportion, is to decompose the pyroxyline, and cause its partial solution in the nitrosulpuric acid. Hence it becomes necessary to work with a smaller quantity of water, and consequently an inferior pyroxyline is obtained, as I shall presently show. The chlorine also slightly modifies the composition of the pyroxyline in some unexplained manner, causing it to give more intensity in the photographic process, and lessening its keeping properties in collodion both before and after iodising. The pure acid answers perfectly, but I do not usually employ it alone, from motives of economy. The plan which I have followed has been to apply to the manufacturer, and ask him to pick out for me a carboy of the purest "acid nitros" in stock; this I test with nitrate of silver, and compare it with a standard kept for the purpose: if the chlorine exceeds a certain quantity, two carboys, one of pure nitric acid, and the other of acid nitros, are mixed in equal bulks. To give a notion of what the standard is, I may mention that if one drachm of nitrate of silver, dissolved in half an ounce of water, will throw down the whole of the chloride contained in half a gallon of the acid, the sample is sufficiently pure.

Besides chlorine, the "acid nitros" contains peroxide of nitrogen, imparting to it a yellow colour; but this, I think, enters into a fresh combination on the addition of the oil of vitriol, and produces no effect upon the immersed cotton.

4. *The Ether.*—Next to the pyroxyline, the ether is the chemical of most importance in making collodion, and I have always in this process felt myself to be at the mercy of the ether manufacturer. Indeed, the purity of ether is of more consequence with pyroxyline of the kind which I recommend than with some other varieties of that substance; and I think that the success of the present attempt to give a definite formula for collodion will depend very much upon whether the makers of ether can supply a uniform article in the desired quantity. What we need is an ether which, when mixed with an equal bulk of strong alcohol containing iodide of potassium in the proportion of three-and-a-half grains to each ounce of the mixture, will remain colourless for several days in the cold season of the year. Commercial ether usually strikes a yellow colour in less than half an hour when treated as above described, but in that case it cannot be termed pure. It is quite possible to prepare ether which will stand the test just mentioned, by proceeding in the following manner:—Take the best washed ether of commerce, and agitate it thoroughly with a small portion of dilute sulphuric acid, then introduce it into a retort, and distil over one-third of the total bulk. It first occurred to me to employ the sulphuric acid, from having noticed that ether which liberates iodine from iodide of potassium, often possesses an alkaline reaction to redden litmus; and since the last distillation which ether undergoes in being purified is from a caustic alkali, I thought it possible that small portions of some volatile organic body of a basic kind, might be carried over with the ether. Whether this be so or not, I am assured, beyond a doubt, that the quality of the ether is materially improved by this final distillation from diluted sulphuric acid; and therefore the additional cost, which cannot exceed sixpence per pound, must not be considered.* The reaction of the pure ether is still alkaline to redden litmus, thus showing that the whole of the acid remains in the retort: specific gravity ·722 to ·725 at 60°. At present I am not able to assert that the ether which I obtain is invariably constant in properties; so that there is room for further improvement, although when we compare ether of the present day with that which was sold in commerce a few years ago, the advance is very evident.

In connexion with this subject of ether, I would add two or three more remarks. It is possible to make any ether stand the test of iodide of potassium most perfectly, by agitating it with a little dry carbonate of potash; but the resulting collodion is, in fact, injured rather than improved by such a process, since the carbonated alkali decomposes the gun-cotton. When, however, we obtain a sample of ether which has been distilled from sulphuric acid, and yet find it to remain colourless for a long time on adding iodide of potassium, we may be assured of its perfect freedom from the "ozonised" principle.†

* The idea is to collect the first portion of the distillate for photography, and to use the remainder for medical or other purposes.

† The condition of ether known as "ozonised" is the same as that to which the term "acid" is often applied; but in testing samples of ether I rarely or never find them acid to test-paper.

The difference between bad and good ether is seen most evidently after long keeping. Supposing light to be excluded, a pure sample of ether may be placed in a bottle, only half full, and at the expiration of two or three months it will scarcely become coloured on the first addition of iodide of potassium. Ether only partially purified will often stand the test of iodide of potassium when freshly distilled, but it will soon acquire the property of liberating iodine when it is stowed away for keeping. Supposing, for instance, that traces of *aldehyde* be present, which is not an improbable notion, this aldehyde would gradually absorb oxygen, and the ether would deteriorate. We must bear in mind that all varieties of pyroxyline have more or less tendency to ozonise ether by degrees, although some are more stable, and consequently superior to others in this respect. Hence, with the best quality of ether, the collodion will not stand the action of iodide of potassium so well as the solvents minus the pyroxyline; but when we have to deal with an inferior ether containing traces of some more oxidisable body, then the peroxide of nitrogen in the gun-cotton will soon act upon this substance, and the collodion will not bear very long keeping without acquiring the property of becoming immediately yellow on adding the iodiser. To show that this difficulty, although requiring further investigation, is likely to be eventually removed, I may mention that a large quantity of collodion which I sent to a friend in Australia was stated by him to remain quite colourless for a time on adding a potassium iodiser, and in consequence the sensitiveness was very great. I do not not consider that any trace of alkali was present in this case to account for the non-liberation of iodine; if so, the collodion would have been slower than usual, instead of being more rapid. The absence of the ozonised condition after so long a voyage depended, doubtless, upon purity of the ether and stability of the pyroxyline. And with an equally good ether the same result might again be obtained.

A few words on the subject of "methylated" ether. I am quite ready to allow that a great improvement has of late been effected in the manufacture of this substance, and that it would not always be easy, even to an experienced person, to distinguish it from the pure ether. Nevertheless, it is certain that the use of methylated ether ought not to be encouraged in photography; for, independently of an action upon the bath which some attribute to it, how can we expect the same uniformity of product when an inferior spirit of wine is usually taken for methylating, and when, in addition, it is not in the power of the manufacturer to exercise any control over the naphtha which the government directs to be added. We know that the purity of ether depends very much upon that of the alcohol from which it is produced, and those foul-smelling organic substances which are often found in ether are really derived from foreign bodies originally present in the spirit. Observe that I am now speaking of ether for the finest description of collodion, iodised with an iodide only. When bromides and iodides are employed conjointly in collodion, the sensitiveness is not so much affected by the state of the ether, and hence the above remarks would perhaps be less urgently called for. Even then, however, the advocates of methylated ether may well be reminded that in the case of collodion prepared with equal bulks of ether and alcohol, the substitution of the cheaper form of ether cannot make a difference of more than one penny per ounce wholesale price.

5. *The Alcohol.*—For a long time I used rectified spirits of wine for the preparation of collodion, and increased its strength as far as necessary by means of dry carbonate of potash; but having at length become dissatisfied with the smell of certain samples of this rectified spirit, I was induced to employ a strong alcohol obtained by one distillation. In rectifying spirit, a liquid known as "faints" is sometimes used, containing alcohol, either strong or weak, but contaminated with essential oils; and since it is most important in photography to avoid that particular class of organic bodies, the grain spirit obtained by one distillation in a Coffey's still is to be preferred. In taking the specific gravity of this spirit, which I have found to vary from ·817 to ·819 at 60° Fah., we see at once the advantage likely to accrue from its employment, since the fousel oil, which boils at a more elevated temperature, cannot rise so high in the still, and is separated. The smell of this spirit is very sweet; and although it is not quite so strong as is required, yet by converting a portion of it into alcohol of ·805, by means of dry chloride of calcium, and mixing this with the remainder, the correct specific gravity may easily be obtained.

The reaction to test-paper of the pure grain spirit should be quite neutral; but I find in some instances that a trace of acid is present, so that each half gallon of spirit requires about one drop of the standard solution of ammonia alluded to in the third division of this paper, under the head of "Preparation of Plain Collodion." I have never yet found in this or any other spirit the alkaline reaction which is exhibited by ether.

6. *The Iodising Compounds.* — A few words will here be sufficient. It has been stated, as an objection to the iodide of potassium, that it cannot often be obtained in a pure form; but so far from such being the case, I have found the yellow crystallised iodide of potassium — that from which the last traces of carbonate of potash have been removed by neutralising with hydriotic acid — to be purer than any other iodide which is sold. It contains usually a little sulphate, but this appears to be inert. Of iodide of cadmium I cannot speak so positively, some samples being only partially soluble in spirit.

Iodide of ammonium is now prepared of good quality by a process of double decomposition; but formerly hydrosulphate of ammonia was

employed in its manufacture, and the product was then inferior, from the presence of traces of a sulphur compound. In other samples of iodide of ammonium I have detected large quantities of carbonate of ammonia, introduced for the purpose of keeping the salt in a colourless condition, and also of sulphate of ammonia. It has been stated by a respectable authority, in the pages of the *Photographic Journal*, that iodide of ammonium must be used whilst fresh; this I think is a mistake, since I have kept it for more than three years in an ordinary bottle; and, with the exception of a little coloration, which does not affect its action in bromised collodion, it is as good as at first.

Apparatus, &c.

The following articles will be found useful in preparing collodion on a large scale:—

1. *Porcelain Pots for the Acid.*—These I purchase of Messrs. Simpson, Maule, and Nicholson, Kennington Road, Lambeth. They are about 7 inches high, four inches in width at the top, and are provided with covers and handles; also with a rim near the upper part, which serves as a support when heat is applied. The glaze is very good, and is unaffected by the acid. They hold an imperial pint and a half.

2. *Glass Spatulas.*—These are made of thick plate-glass, and may be obtained at Messrs. Brown's warehouse, Farringdon Street. Length 10 inches, breadth $1\frac{3}{8}$ inches, thickness $\frac{1}{4}$ inch. I find them to answer better than rods for immersing and removing the cotton.

3. *Hot-air Bath.*—This is a simple apparatus for warming the pots containing the acid mixture, when the temperature is inadvertently allowed to fall too low. It consists of an open vessel like a saucepan, made of strong sheet-iron fastened by rivets, standing on legs over a Bunsen's burner. In the part corresponding to the cover of the saucepan is a round hole, into which the porcelain pot drops, until it is caught and supported by the rim. The pot does not touch the bottom, but approaches very near to it, and hence all danger of cracking is avoided, whilst sufficient heat can be obtained in a few minutes.

4. *Thermometer.*—Select an instrument with a wide column of mercury, so as to be easily seen by gaslight, and with a large bulb, that it may be sufficiently sensitive. It is quite necessary to compare the thermometer with a standard instrument, since I find that the cheaper thermometers constantly vary, to the extent of several degrees. It is useful also to have a second thermometer hanging up, with which to compare the first, since the column of mercury sometimes separates, leaving a vacant space, and thus indicating too high a temperature.

5. *India-rubber Gauntlets.*—These are indispensable, as a protection to the hands in making large quantities of pyroxyline: they may be obtained of Messrs. Matthews and Son, Charing Cross.

6. *Trough for Washing.*—It consists of a strong deal framework, 3 feet long by 2 feet wide, lined inside with gutta percha. The water passes in through two tubes, one at the end and the other near the centre, each being pierced with fine holes, so as to deliver the water in a series of jets, and keep up a constant current at every part of the tray.

7. *Steam-bath for Drying Cotton, &c.*—This may be made by first constructing a flat zinc tray, 2 feet wide by 4 feet long, with a tightly soldered cover, and standing on short legs. The water is boiled in an ordinary tin saucepan, and the steam conducted by a pipe about 3 feet long, well rolled in list or flannel, into the closed tray, the condensed water being allowed to drop out at the end. Pyroxyline may be dried with safety upon this bath, since the flame is placed at a sufficient distance; and the heat can be regulated at will by adjusting the supply of gas. If the upper zinc plate be covered with flannel or calico, the temperature does not rise higher than 130° Fahrenheit.

Preparation of Collodion.

1. *The Pyroxyline.*—I have always adopted the plan of laying in a large stock of acids at one time, since it is somewhat troublesome to ascertain the exact strength, and no mode of analysis seems to be perfectly satisfactory. The manufacturer sends in three carboys of oil of vitriol, holding six gallons each, and one carboy of strong nitric acid of the same size. These are bottled off into Winchester quarts, or half-gallon stoppered bottles (labelled No. 1 for the first carboy, No. 2 for the second, and No. 3 for the third), for the sake of greater convenience in handling, and to lessen the chance of the acid absorbing water from the atmosphere. As the strength of the oil of vitriol in each carboy is different, a mixture must be made of No. 1, No. 2, and No. 3, taking a single bottle of each. Then, supposing the specific gravity of the acids to be nearly as before given, mix as follows:—

Oil of vitriol, 1·843 at 60° Fah.......	18 fluid ounces.
Nitric acid, 1·457 at 60° Fah.........	6 „ „
Water.............................	$5\frac{1}{4}$ „ „

Pour in first the water, then the nitric acid, and lastly the oil of vitriol; obtain a perfect admixture by stirring, and take the temperature. If the thermometer rises to 165° or 170° Fah., the acid must be allowed to cool until it stands exactly at 150° Fah. Then immerse the cotton in pieces well pulled out, and weighing thirty grains each, continuing to put them in singly until *ten* have been introduced, making 300 grains in all. This operation, together with the pressing against the sides of the vessel, &c. (to be alluded to again presently), will occupy about two minutes, after which the vessel may be covered up and left for eight minutes more. Then take out the whole of the pyroxyline in one lump with glass spatulas; squeeze out as much of the acids as possible in a porcelain capsule, and dash the whole into a large quantity of water.

An experienced person will be able to judge at this stage of the process whether he has hit the right point. If, on attempting to lift out the whole mass of pyroxyline at once with the glass spatulas, it seems rather small in quantity and very rotten, so that little pieces break away and are left behind in the acid, then the temperature is too high, or the acids are too weak, and in repeating the operation the quantity of water may be diminished by two or three drachms. If, on the other hand, the mass of pyroxyline appears large, sticks well together, and shows no tendency to tear, either the temperature has fallen several degrees, or it will be advantageous to work with a few drachms more of water.

Whilst the pyroxyline is washing in the tray, it is still more easy to judge of its quality; for if the ten separate pieces, in which the cotton was originally weighed, are seen floating about, and can be separated and counted, the acids are certainly too strong; whilst if there be an evident aspect of commencing solution—a piece of cotton here and there scarcely changed, but the others in a measure broken up, and tearing easily under the finger—the operation is probably successful; but when the whole is so mixed up together that nothing but fragments of the ten pieces can be detected, then the pyroxyline is too weak.

I find that it takes twenty-four hours to ensure the proper washing of the pyroxyline, even in a slowly running water which contains a portion of chalk. This carbonate of lime evidently acts in neutralising the acid, and bubbles of carbonic acid gas form, which bring the cotton by degrees to the surface of the water, and keep it floating.

After a thorough washing, the pyroxyline is squeezed in the hand, and then picked out to dry upon a cloth. A boy performs this part of the operation; and after a little experience, he can tell easily whether the material was properly made, partly by the extent of surface which it covers upon the cloth, but more easily by the readiness with which it tears under the fingers. If it resembles the original cotton in appearance, and feels strong and tough, the amount of water in the acids must be increased; but when it breaks up into little bits, as it should be, or else is somewhat too weak, in which case the fragments will mat together, so as to increase the difficulty of picking them out. As the pyroxyline dries upon the cloth it is well to examine it and give directions accordingly, separating any piece which appears less acted on than the rest.

Two or three days' exposure to the air will render the soluble cotton sufficiently dry; but it is convenient to finish it off on the hot steam-bath before described, and the temperature in which is not allowed to rise higher than 120° Fah. When dry, proceed to weigh it on the scales, and form your estimate of its value accordingly. A long experience convinces me that, supposing nothing to be lost in the washing, the weight of the resulting pyroxyline is a certain and safe guide in this process, and I can always tell what the quality of the collodion will be by using the scales. If 300 grains of cotton yield 450 grains of pyroxyline, it is certain that complaints will be made of the resulting collodion being thick, and giving streaky pictures: four or five additional drachms of water in the nitrosulphuric acid will be the remedy. When the weight of the pyroxyline is the same as that of the original cotton, viz., 300 grains, there will be a sediment on dissolving it in the mixed ether and alcohol; nevertheless the collodion, although lessened in quantity, will be good,—very limpid and structureless, with great adhesion to the glass, less tendency to markings of all kinds, and considerable softness of negative, with sensitiveness to dark rays. The chance of spots, however, is peculiarly great with this collodion; for if the smallest particle of dust touch the film, it will almost certainly arrest the development, and produce a transparent circular mark.

The weight which on the whole I think to be best is 375 grains, that is to say, exactly 25 per cent. of increase: this gives sufficient fluidity of collodion, and at the same time leaves very little sediment in dissolving.

The above facts are quite reliable, since they have been verified by repeated observation, extending over a long time. It must, however, be distinctly understood that the weight of the pyroxyline can be taken as a criterion of quality only under the conditions stated in this paper,—the fibre of the cotton must be cleaned by potash and quite dry, the nitric acid nearly free from chlorine, the time of immersion always the same, and, most important of all, the temperature correctly ascertained, otherwise the weight will be so variable that nothing can be deduced from it, and the cotton may be considerably acted on, even when the acids are strong enough to produce an explosive variety of pyroxyline. The whole process, in fact, requires care, because it is conducted with the maximum quantity of water, and at a high temperature. At least 20 per cent. of the pyroxyline is dissolved in any case; and the acids having once begun to act, will readily destroy the remaining portion of the fibre, if an error be permitted.

Before passing on to the preparation of the collodion, it may be mentioned that the quantity of pyroxyline which I find it convenient to make at one operation is four times that stated. A double quantity of acids (36 ounces of sulphuric and 12 of nitric) is mixed in a jug, and poured into the porcelain pots before mentioned. The first 300 grains of cotton are then immersed and left digesting, whilst the second similar portion is put into vessel No. 2. When the pyroxyline has been removed, the acids are emptied out, and a double quantity again mixed as before. At one time I adopted the plan of using the old acids again, by adding oil of vitriol to restore the strength, but afterwards discontinued it as causing uncertainty.

The Plain Collodion.—This is made by introducing half a gallon of alcohol of ·805 into a two-gallon stoppered bottle, and adding 1900 grains of dry pyroxyline. When the pyroxyline has become thoroughly saturated with the alcohol, pour in half a gallon of ether of ·725, and agitate for two or three minutes; next add another half gallon of ether, and again shake the bottle for a few minutes. After this the collodion may be allowed to settle for about a week or ten days, when it will be sufficiently clear for use. The quantity of pyroxyline may be increased to 2200 grains when a collodion of some body is required, or reduced to 1800 for a thin collodion suitable for large plates. Supposing the height of the column of collodion as it stands in the bottle to be ten inches, the sediment measured twenty four hours after mixing is often about half an inch, but it settles down more closely at the expiration of a week or ten days. If the sediment should stand as high as two inches in the bottle, the collodion is probably of that kind which has been described as giving a soft negative with a tendency to white spots. The above point being of importance in a commercial point of view, I have taken pains to collect the sediment from more than two hundred gallons of collodion, and find that the loss does not exceed one pint in fifty. It appears at first to be much greater than this; but the residue continues to settle for many months, the clear collodion being occasionally drawn off from the upper part and added to the general stock, a small portion at a time. I have sometimes thought that the proportion of *undissolved* matter is greater when the pyroxyline has been dried by artificial heat; but I am not able to speak positively, since I usually dry by spontaneous evaporation.

On the day following the preparation of the collodion, about half of a fluid ounce may be drawn off by a pipette from the upper clear portion, and a minute piece of red and blue test-paper immersed for twelve hours. If, at the expiration of that time, the blue paper appears reddened, the pyroxyline was imperfectly washed, and the standard alkaline solution, which I shall immediately describe, is dropped into the plain collodion in the proportion of one full-sized drop to each half-gallon. This addition of alkali is seldom required in my practice—certainly not oftener than once in twenty times. If, however, the pyroxyline be removed from the washing-tray at the expiration of twenty-four instead of forty-eight hours, traces of acid are generally to be detected in the collodion. To make the standard solutions which are required, dilute the nitric acid of 1·45 with an equal bulk of water for the acid, and then dilute down the strong ammonia of commerce also with distilled water, until a fluid drachm exactly neutralises a corresponding bulk of the standard acid. With these two liquids at hand no further trouble will be experienced, since the quantity of acid left in the pyroxyline varies very little; and if any number of drops of ammonia be added in excess, a corresponding number of the acid liquid will neutralise them.

The Iodising Solutions. — There are three iodising solutions, made by the following formula: —

No. 1. (Potassium iodiser): —

Alcohol, ·817 at 60°	$1\frac{1}{2}$ gallon.
Iodide of potassium	3200 grains.

It is necessary to pulverise the iodide very carefully, and to warm the spirit in a glazed covered saucepan to about 120° Fah.; after which, on drawing it off into a stoppered carboy, perfect solution will take place with ten minutes' shaking. Filter through pure bibulous paper.

No. 2, (Cadmium iodiser): —

Alcohol, ·817 at 60°	$1\frac{1}{2}$ gallon.
Iodide of cadmium	4000 grains.

Dissolve in the cold; no pulverising required.

No. 3. (Bromo-iodide): —

Alcohol, ·817 at 60°	$1\frac{1}{2}$ gallon.
Iodide of ammonium	2000 grains.
Iodide of cadmium	2400 „
Bromide of ammonium	1200 „

Pulverise and dissolve without heat.

Precautions to be Observed.

The proportion in which the iodising solutions are to be added to the collodion is the same in each case, viz., two fluid drachms of iodiser to six drachms of collodion; they may be employed separately, or in a state of mixture, but it is not advisable to add No. 3 to No. 1 in a proportion greater than one-fourth of the former, lest crystals of bromide of potassium should be precipitated.

At the risk of appearing prolix, I have decided on calling attention to certain minor details of manipulation, which are in themselves simple, but may be unknown to some who may yet wish to carry out the instructions contained in this paper.

Beginning with the cotton, which we suppose to have been previously cleansed by potash, it will be necessary to dry it very perfectly before using the acids, since the quantity of water which I have given in the formula is so great, that any further dilution would certainly ensure the destruction of the fibre by the nitrosulphuric acid. The cotton may be dried near the fire, or upon the steam-bath before mentioned; and, when once dried, it must not afterwards be left in a damp place.

In mixing the acids, it simplifies matters to select a stoppered bottle which holds very nearly the proper quantity of oil of vitriol when filled quite up to the neck. The nitric acid and the water may be measured in a narrow cylindrical hydrometer glass — a mark being made for the former with black varnish, at a height corresponding to one-third of the bulk of the oil of vitriol, and a second mark lower down for the water, the quantity of which will vary according to the strength of the acids. Before using these measures, always invert them, and allow the drainings from the last operation, consisting of acid diluted by absorption of atmospheric moisture, to flow out. Then measure the oil of vitriol, and make a leaden counterpoise for it in the scales, bottle included. This is necessary when perfect accuracy is desired, since otherwise the nitrosulphuric acid will be stronger in winter than in summer, which I have found to be the case to a noticeable extent—the product of pyroxyline obtained from 300 grains of cotton being fifty grains heavier in frosty weather than during the hot months of June and July. It is not absolutely necessary to weigh either the nitric acid or the water; and, with regard to the sulphuric acid, the plan which I have adopted has been to measure it as a rule, but to put the bottle afterwards into the scales, if a sudden change of atmospheric temperature takes place.

A failure would certainly be produced if the three constituents of the nitrosulphuric acid were not properly mixed; but there is no difficulty in effecting this by stirring with the broad spatula for half a minute in a shallow vessel. In the deep porcelain pots before spoken of it may not be quite so easy, and thus it is advantageous to adopt the plan which I have usually followed of mixing a double quantity of acids at one time in a jug, and pouring it afterwards into the pots. The sides of the jug, however, must not be too thick, or the temperature will sink below 150° in very cold weather, especially when the sulphuric acid is a little weaker than usual, or the mixture is kept too long in the jug.

Some persons may perhaps be inclined to keep a portion of the nitrosulphuric acid ready prepared, and to obtain the correct temperature by mixing cold acid with the hot. If so, bear in mind that a stoppered bottle must be used, since nitrosulphuric acid, like oil of vitriol, absorbs water from the atmosphere. On one occasion some experimental results were completely spoilt, by leaving the acid for a few days in a beaker covered by a glass plate; the upper part became so far weakened that, on putting in the cotton, it instantly dissolved.

Taking the temperature of the acids is an operation of some nicety, and especially so in cold weather. Begin by stirring briskly with the glass spatula in a circular direction; then dip the thermometer exactly into the centre of the liquid, and hold it in that position for at least a minute, since the rise of the mercury, although rapid at first, may be very slow towards the end. If the acid be too hot, it can be cooled two degrees, by taking a cold spatula and stirring it for a few seconds; therefore it is of consequence that the spatula which is used to immerse the cotton should be previously warmed by dipping it in the liquid. The acids also must be at least at 165° Fah. when they are first placed in the porcelain vessel, otherwise its thick percelain sides will reduce the temperature so rapidly that, although the thermometer may indicate 150° Fah. at first, it will soon fall, and the weight of the resulting pyroxyline will be greater than that indicated for a given strength of acids. In order to obtain a uniform temperature during the time that the pyroxyline remains immersed, I invert large jars upon the porcelain pots, and keep them covered, so as to prevent the cold air from blowing on the sides.

The boy who weighs the cotton into pieces of 30 grains each is directed to pull out each piece thoroughly, and work it with his fingers into a circular form, to facilitate absorption of the acid. In pursuance of the same object, each piece, as it is placed in the acid, is carefully pressed with the spatula against the side of the vessel; and in order that the last pieces may not be at the top (in which case they always come out less broken than the others), a *well* of acid is kept free by means of the spatula, and these last pieces are pushed down nearly to the bottom. When all have been immersed, the mass is squeezed against the vessel, first on one side and then on the other, for more than a minute, after which the whole is loosened by putting the spatula down to the bottom, and raising it up until the pyroxyline nearly fills the liquid; the vessel is then covered up and left for eight minutes, as before said. I think it of consequence not to finish the process of putting in the cotton by pressing it down to the bottom in a hard mass, because a good deal of solution always takes place in the acids, and this is attended with an evolution of *heat*, which increases the disintegrating action on the cotton. The object, therefore, is to prevent the mass from "heating" as far as possible, by loosening it out with the spatula and diffusing it through the liquid. Observe, however, that the cotton must not be permitted to project above the surface into the air, or oxidation and evolution of red fumes will take place. These little matters may seem unimportant, but unless they are attended to, no two portions of pyroxyline will correspond in weight.

I employ both spatulas in removing the pyroxyline from the acids, forcing them down to the bottom on opposite sides, and then bringing them together so as to pinch the mass and lift it out entire. In squeezing the acids away no time must be lost, or the action of the air may produce oxidation and red fumes. A few seconds will be sufficient, and especially so if great pains be taken to distribute the pyroxyline through the water by catching it with the gloved hand. A sensation of heat is felt at first, due to dilution of the oil of vitriol; but this soon ceases, and the chance of failure from that cause is very slight. If the material, however, were simply thrown into a small quantity of water, and allowed to remain, the rise of temperature might be sufficient to cause solution.

I was not without hope at first that the waste nitrosulphuric acid, which one scarcely likes to throw down the sink, lest it should act upon the leaden pipes, might be useful for some other process. In this expectation, however, I have been disappointed, since the pyroxyline which it contains in solution appears to interfere with its application to any such purpose as dissolving metals, &c.

I will here remark upon the importance of rejecting any pyroxyline which turns out unsatisfactorily — perhaps from the cotton having been laid on a wet board, or left too long in the acids, &c. If any such accident happened in my practice, the whole batch was at once thrown down the sink, since collodion is an expensive material, and one of too much consequence to be trifled with.

At first, I was in the habit of placing the pyroxyline in the gutta-percha washing dish immediately on taking it from the acids; but, finding that the heat and acid together gradually decomposed the gutta-percha, and made it sticky, the plan was adopted of throwing the soluble cotton first into a leaden sink, and, when the greater part of the acid had been removed by a few hours' washing, lifting out into the gutta-percha dish.

The gutta-percha washing-tray will require cleansing after a week or so; a deposit adheres to the bottom, which seems to consist of matted fibres of partially dissolved pyroxyline. This material having been some time in the water, might perhaps decompose and liberate oxides of nitrogen in collodion I am careful, therefore, not to disturb it at first; and, when sufficient has collected, it is scraped out, and the tray washed with water.

It is better not to complete the washing of the pyroxyline with boiling water, nor to use any carbonated or caustic alkali to remove the last traces of acid. All alkalies tend to decompose pyroxyline, and remove a portion of the peroxide of nitrogen in the form of nitrite; and, although I am aware that dilute ammonia is commonly employed to neutralise the acid, I have long discontinued its use, finding that some varieties of pyroxyline assume a yellow colour, and become more unstable in collodion when previously treated with ammonia.

The pyroxyline may be prepared in small quantities at a time, as required for use; but if it be necessary to keep it in stock (which I myself have never done), it should be dried either over oil of vitriol, or at a temperature below 120° Fah. Mr. Hadow mentions 140° Fah. as the point which ought not to be exceeded. Probably something depends upon the particular variety of pyroxyline; and with some kinds I have seen red fumes given off, on placing the material in a covered tin vessel surrounded by boiling water. Pyroxyline for keeping ought also to be put away in a dry place, and excluded from light, since this substance is known to be liable to spontaneous change, and unfortunately the exact conditions of permanency have not been ascertained. Having completed the preparation of the pyroxyline, this list of "Precautions" is nearly at an end: a few words on the subject of plain collodion will close it. When first I commenced the manufacture, I employed glass carboys for holding the collodion, but afterwards rejected them for two reasons: partly because the shape is inconvenient as regards the deposition of the sediment; and, secondly, the glass being sometimes badly annealed, has been known to yield to the inside pressure in hot weather. For the last two years and a half I have substituted narrow-mouthed stoppered bottles, holding two gallons each: they may be obtained of Messrs. Brown and Co. of Farringdon Street.

There is a decided advantage in placing the alcohol in the bottle before the ether, not only in facilitating the solution of the pyroxyline, but also in enabling the operator, by shaking the bottle, to remove a flocculent deposit, which otherwise is apt to adhere, and to be drawn over with the collodion; the mass of pyroxyline wetted by the spirit acts effectually as a *mop*, and cleanses the sides.

In drawing off the collodion, place the bottle in such a position that the end of the siphon comes between the eye and a strong light; any flocculi which appear likely to be drawn into the end of the siphon will then be seen, and may be avoided. When it is not intended to refill the bottle immediately, pour out the sediment and introduce half a gallon of absolute alcohol, which will absorb the remaining ether vapour, and prevent it from being oxidised into acetic acid, and afterwards forming acetic ether. On one occasion a two-gallon bottle having been used for collodion and left empty, was put away in a dark place for about three months It was then washed out with about a pint of plain collodion and refilled. The result, however, was unsatisfactory; for on adding the iodiser to the newly-made batch, it at once became yellow, which was probably due to portions of collodion left at the bottom of the bottle having decomposed and ozonised the ether. Mere washing with plain collodion was not sufficient in this case, and a thorough cleansing with shot and water should have been resorted to.

No attempt must be made to utilise the sediment of the plain collodion by redistilling the ether from it. This I have tried, but with indifferent success; for although the ether so recovered appeared tolerably good at first, it soon acquired the property of liberating iodine from iodide of potassium, and the collodion then became unfit for any purpose, excepting copying objects of still life, where extreme sensitiveness is not required.

Whilst the collodion is settling down, the bottle should be covered over, to exclude the light. The room which I used was a vault, lighted by gas; and whilst plain collodion remained in that room, it continued good; but if any portion were taken up into the glass house, and left exposed, I always found that it gradually deteriorated, colouring at once on adding the potassium iodiser, and being deficient in sensitiveness.

In manufacturing collodion in large quantities, I think that mistakes will be prevented if separate measures, scales, funnels, &c., are kept for each purpose; and in cases where two operations are being carried on at the same time—such as picking out wet pyroxyline, and filtering iodising solution—a basin of water may be placed near at hand, into which the boy dips his fingers in passing from one process to the other. The mention of matters so trivial may excite a smile; but I think that the importance of extreme method in all matters relating to photography is sometimes overlooked.

Observations on the Preceding Formula.

The distinctive peculiarity of the collodion now described is in the pyroxyline, which, by a proper adjustment of the proportions of the two constituents of the nitrosulphuric acid, acquires peculiar properties. These I need not now describe, seeing that they are sufficiently referred to in the Report of the Collodion Committee; suffice it to say, that by using the sulphuric acid much in excess of the nitric, great transparency and toughness of the film are secured, with a fine surface texture, which gives sharp definition. At the same time a quality of image is obtained corresponding closely with that produced by an organic material like gum-arabic applied to the surface of the film, and possessing a fine ruby red colour when taken in a moderately good light.

With regard to the temperature at which the pyroxyline should be made—I worked at first at 140° Fah.; but at the commencement of last spring was induced to raise it ten degrees, in consequence of representations that the collodion was somewhat deficient in fluidity. This increase of temperature, however, assists in generating traces of a body (probably nitroglucose) which causes the collodion to lose its sensitiveness more rapidly after iodising.

Some perhaps will not be prepared to believe that a sensitive pyroxyline can be made at so high a temperature as 150° Fah.: and with nitrosulphuric acid of the ordinary composition, this would indeed be difficult. When, however, the proportion of nitric acid is greatly reduced, I do not find that the sensitiveness is so much affected by the temperature of the acids.

The proportions of ether and alcohol in the collodion, half-and-half, will, I think, be found to be those best adapted for general purposes. With less alcohol the film is more contractile, and more prone to dry up after sensitising. With a larger proportion of alcohol, say two parts of alcohol of ·805 at 60° to one of ether of ·725, the sensitiveness is impaired. A friend, whose judgment is quite to be relied on, has used more than two gallons of my collodion prepared with excess of alcohol, and he assures me that it is remarkably well adapted for coating large plates, and is sufficiently sensitive for copying works of art and for landscapes; nevertheless I do not recommend this formula in preference to the other for a normal collodion, seeing that we have no means of increasing sensitiveness when it proves deficient.

I have tried the effect of varying the strength of the alcohol from sp. gr. ·805 to ·820. When the ether and alcohol in the collodion are used in equal parts, the latter must not be in what is termed the absolute state (sp. gr. ·805), or the film will be more or less impervious to liquids, like gutta percha, if the particular pyroxyline which I advise be adopted. With alcohol not stronger than ·820, the collodion works well at first, but becomes rather thick and non-adherent towards the bottom of the bottle. I therefore take an intermediate strength, by using alcohol of ·805 for the plain collodion, and alcohol of ·817 for the iodiser.

The quantity of iodide of potassium in collodion made by this formula ought not greatly to exceed 3½ grains to the ounce, or there will be peculiar markings on the surface of the iodide of silver at the lower corner of the excited plate. The purer the pyroxyline, the greater the chance of the iodide being in excess; but nevertheless, if the above-mentioned quantity should produce a film more opalescent than the operator desires, it will be in his power to give additional creaminess by introducing a little iodide of cadmium, without any danger of the iodide bursting out upon the surface and producing the marks before described.

In the Report of the Collodion Committee recently published, I think that an erroneous impression is conveyed as to the length of time this collodion will keep after iodising, which may have resulted from several members of the committee having worked in a bad light. Certainly there are some varieties of pyroxyline which displace iodide from iodide of potassium less rapidly than the pyroxyline which I advise; but there are others which do so more rapidly, and hence the position of the collodion as regards keeping properties is intermediate. It is also in our power to increase the stability, by using the mixed iodides of potassium and cadmium instead of the iodide of potassium only, after which the collodion will retain a fair share of sensitiveness for many weeks.

The cadmium iodiser has not the marked effect in glutenising this collodion which it is known to exercise with some other kinds; and when the nitrosulphuric acid is used at the weakest point possible, the resulting collodion, iodised with cadmium, will be quite manageable even on glasses of considerable size.

White spots have been spoken of in connexion with the potassium iodiser. My experience leads me to believe that they do not depend upon any insoluble particles, but are due to specks of dust adhering to the film. I find the same spots oftentimes in collodion containing only iodide of cadmium; and since the mixture of ether and alcohol given in the formula is capable of dissolving 4 grains of iodide of potassium to the ounce, it is not easy to understand how there can be any insoluble particles, when only 3½ grains are employed.

In proposing the pyroxyline mentioned in this paper as a good commercial form, I would call attention to the tenacity with which it adheres to the glass: it has been pointed out to me that the collodion, after keeping for a time in the iodised state, is well fitted for use in Taupenot's process, and does not show any disposition to rise in blisters beneath the albumen.

The principal fault which I found in this collodion during the last summer was the occasional occurrence of fine black lines, showing on the

finished picture in the direction of the dip. They are most abundant when the pyroxyline is made in rather concentrated acids; and by increasing the quantity of water in the nitro-sulphuric acid, are nearly removed. Much may therefore be expected from the use of potash as a cleansing agent to the cotton, since a weaker nitrosulphuric acid can then be employed without causing solution of the fibre.

The foregoing paper is incomplete in one point, viz., in not describing the effect of leaving the cotton in the nitro-sulphuric acid for a longer or shorter time. My experience has been, that a short immersion gives a product at least 15 per cent. heavier, but dissolving in the ether and alcohol with a larger amount of sediment, and yielding a slightly less limpid collodion.

ON GUM AS A PRESERVATIVE AGENT IN THE DRY PROCESS.

By R. W. Forster.

Observing that gum has been lately recommended as a preservative agent for dry collodion, I am induced to communicate the results of my experiments with that substance during the past summer, in the hope that they may prove useful to some of your readers.

The trouble of preparing the albumen solution for the Fothergill process, the rapidity with which it spoiled in warm weather, and, I may add, the uncertainty of the results obtained, urged me to seek some other preservative which could be readily prepared, and would keep for a length of time in working order. After trying various other substances, I found gum-arabic to satisfy my requirements best upon the whole. The strength of the solution is not very material — one ounce to ten or twelve ounces of water answers very well: by keeping a bit of camphor in the bottle it may be preserved fit for use for any length of time. I proceeded as usual in the Fothergill process; washed the sensitised plate in a *measured* quantity of water (six drachms for a stereoscopic plate), poured on the preservative solution, and washed again thoroughly under a tap.

I find this process to yield exceedingly good and certain results, though the keeping qualities of the plates appear rather limited. At the end of a fortnight in warm weather they begin to deteriorate, though in any less time I have never found any change. Probably, however, they would keep longer if the coating of gum were allowed to remain on the plate, instead of being washed off.

There is, however, one great difficulty which I have never been able altogether to surmount, but which I am convinced is in no way connected with the nature of the preservative solution employed. I allude to the appearance of what has often been described as "marbling," or "brain-like markings," in the sky and high lights, and which completely spoils otherwise good negatives. This fault is not, however, peculiar to the Fothergill process, as I have met with it in using Norris's prepared dry plates.

I at first supposed imperfect washing to be the cause, and therefore varied the method, increased the quantity of water, and took every possible precaution, but all to no purpose. That the fault was not in the developing was proved by the fact that, on carefully examining a prepared plate by daylight, the markings could be faintly seen, though they could not be detected by artificial light, or in the yellow light of the operating-room. As the bath used was newly made and in good order, nothing remained but the collodion to be examined.

The collodion I usually employ is iodised with iodide and bromide of cadmium; and as these salts have the effect of causing collodion when kept long to assume a sort of gelatinous consistence, it occurred to me that some such action might be the cause of the defect. The adoption of an ammonium iodiser was, however, unattended with any better results. I next tried varying the proportions of ether and alcohol, the addition of chloroform, &c., without much better success. I found, however, that the evil might be mitigated to some extent, though not cured, by immersing the plate in the bath as quickly as possible after coating with collodion. It should be mentioned, that though various samples of pyroxyline were tried, all were of a kind yielding a tolerably tenacious film, which was found quite needful, in order to withstand the necessary washing; for nothing, I think, can be more provoking than when you have got a good negative to see the film give way under the final washing. I next tried Keene's collodion, but found it gave a film deficient in strength, and extremely liable to wash off. That, however, was remedied by a preliminary coating of gelatine, and a few pictures were obtained free from the grand defect; but my experiments in this direction were cut short by a totally unexpected difficulty, which I have not heard of as having occurred to any one else. This was the rising of the film in blisters *during or after the washing for removing the surplus preservative solution.* The blisters disappeared when the plate was dried, but left marks of their outlines, which became very conspicuous when the picture was developed. This blistering was not obviated by the careful drying of the gelatined plates, either at the ordinary temperature or by artificial heat; nor even by strongly heating them over a spirit lamp. I have not experimented any further with regard to this difficulty; but perhaps some of your readers may be able to give an explanation of it.

From the results of these experiments I have little doubt that the cause of the "marbling" is the use of a collodion giving too strong and compact a film; yet it is very desirable to have a film tenacious enough to bear moderate washing without having recourse to a preliminary coating of the plate, which not only entails additional trouble, but a double risk of dust specks, the danger of spoiling the silver bath, and other disadvantages. The developer which seems to answer best for this process is composed of two grains pyrogallic and one grain citric acid to the ounce of water. For fixing I am uncertain whether cyanide or hypo is preferable; the latter is what I have generally used, but it is necessary to guard against making it too strong, as a saturated solution has a very marked effect in weakening the film.

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

The Foreign Stereoscopic Cabinet.

Lovell Reeve, 5, Henrietta Street, Covent Garden, London.

This is a happy idea, which, if well carried out, cannot fail to be popular. Instead of circulating a collection of stereographs in the book or pamphlet form, Mr. Reeve has commenced publishing a series of foreign views for the stereoscope, mounted in the ordinary way, and having the descriptive letterpress at the back of each subject—a packet of three slides, contained in an envelope, being issued every month. Of the subjects now before us (those contained in packet No. 1), the assemblage is somewhat heterogeneous, consisting of The Trade Hall at Bruges, by E. Moxham; a pent-roofed shop against the Monument of St. Ronian, in Normandy, by the late R. Howlett, entitled, A Sketch of Character at Rouen; and the Valley of the Flen, Lausanne, Switzerland, by the Rev. J. Lawson Sisson. We do not know by what process the last-named subject was taken; but, if by the turpentine-waxed paper method introduced by the operator, it testifies to the excellent definition capable of being attained thereby. The high lights are a little over-developed, producing a slightly chalky effect, but in other respects the specimen is one of a picturesque and pleasing subject, well executed. Of the other two slides we prefer Mr. Howlett's, which is artistically graphic and attractive.

There are two or three points upon which we fancy the publisher might improve. In the first place we expect that it would be more interesting if, instead of mixing together scenes from various localities, a series illustrative of a continuous tour were issued. This arrangement would be more instructive, and might be managed so as to give quite as much variety as is at present the case: architecture, landscape, and local character might all find a place; and, once "in for a journey," few subscribers would be inclined to discontinue till the close. Our next hint applies to a point of manipulation. The specimens under inspection, though otherwise well executed, are somewhat spoilt from not having been printed upon sufficiently glazed paper, which for stereoscopic slides cannot be too highly albumenised, as the offensive grain of the paper when under examination in the stereoscope is to a very considerable extent neutralised. The third defect to which we would direct attention, though a small one, and not peculiar to the specimens now under notice, is one so easily obviated that we think there are few persons who would not avoid it if their attention were drawn to the objection: it is that of cutting the proofs in an arched form at the top. This is a very common practice with many operators, because it gives a sort of finish to the slide, but is very detrimental to the effect in the stereoscope, particularly if, as in the best instruments, the subject be viewed through a rectangular diaphragm; but, under any circumstances, the arched form is a mistake for stereographs, for we are not often in the habit of seeing subjects through apertures of that form.

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

(*Concluded from page* 37.)

We will now turn our attention to the fixing agent most generally employed, and to which in most cases the gradual fading of proofs is due. The hyposulphite of soda dissolved in water is employed

in various degrees of strength: we shall soon decide what degree of strength is best; but at present we confine ourselves to replying to this question — Does hyposulphite of soda leave any thing in the proof that can cause it to fade?

When a proof is allowed to remain a proper time in a fresh bath of hyposulphite of soda, experiment shows that the fixing is excellent; and analysis proves that the fixing agent has not left in the proof the least substance that can alter it, either immediately or subsequently.

But this clear and precise result is modified in a disastrous manner in certain cases, which may all be summed up in two, one of which is easy to study, while the other presents great difficulty and complexity.

We will commence with the study of the latter.

Every photographer is aware that when we take a certain quantity of a solution of nitrate of silver and pour it cautiously into a solution of hyposulphite of soda, that a white precipitate appears, which is immediately dissolved. This precipitate is hyposulphite of silver, $Ag\,O, S^2\,O^2$. It is a very unstable body, insoluble in water, and which, immediately it assumes the solid state, is decomposed into sulphide of silver and sulphuric acid, according to the formula:—

(a). $Ag\,O, S^2O^2 = Ag\,S + SO^3$

This body will combine with hyposulphite of soda (which is what takes place when it dissolves), to give rise to a very beautiful crystallised salt, slightly soluble in water, and more soluble in hyposulphite of soda, to which Sir John Herschell, who discovered it, gave the formula,

$$(Ag\,O, S^2O^2)\ \ 2\,(Na\,O, S^2O^2)$$

We obtain the same compound in a state of solution in hyposulphite of soda, when we agitate a solution of the latter salt with an excess of recently precipitated chloride of silver. This body, the properties of which have not yet been well examined, becomes decomposed immediately it is placed in contact with an excess of nitrate of silver, and conforms then to the reaction *(a)*. It is upon these two compounds that the alteration of the proof depends, in the conditions under consideration; and we can describe the latter by saying—

Every time that the fixing by hyposulphite of soda is made in such conditions that the hyposulphite of silver remains for a few moments in contact with the paper without the power to dissolve in an excess of hyposulphite, this salt will be decomposed in the sheet according to the reaction *(a)*, and, in consequence of the formation of sulphuric acid, will give rise to the decomposition of one equivalent of hyposulphite of soda.

(b). $SO^3 + Na\,O\,S^2O^2 = Na\,O\,SO^3, + SO^2 + S.$

The sulphur thus formed will be deposited on the proof, side by side with the sulphide of silver, so that not only a part of the silver covering the proof will be sulphurated on leaving the bath, but it will also carry off a second quantity of sulphur, which, little by little, will sulphurate the unattacked silver and alter the proof, and consequently make it undergo a more considerable sulphuration.

We must, therefore, occupy our attention in seeking the conditions under which these accidents can be produced. The one is accidental, the others are produced normally, when a bath is employed in fixing too great a number of proofs. We now proceed to the examination of each.

When a proof is taken out of the printing frame and immediately immersed in the fixing bath, it must be continually moved about, otherwise a considerable quantity of hyposulphite of silver will be formed in contact with the proof; and not meeting with sufficient hyposulphite of soda to dissolve it, it is precipitated and decomposed, as will be shown.

If a large number of proofs are placed in contact in the bath, without a certain interval of space between them to permit the hyposulphite of soda, when stirred, being renewed among each of them, the same accident occurs, and in this case, as in the former, the proofs will very probably be lost.

An accident of the same kind, but local, occurs when a bubble of air forms on the proof being fixed. Then the hyposulphite of soda passes by capillary attraction through the fibres of the paper opposite to the air-bubble, and forms in the substance of the paper hyposulphite of silver, which, not being dissolved, is immediately decomposed on the spot, and forms those yellow stains which photographers are but too well acquainted with.

We now arrive at the normal causes. They are due to the employment of the solutions known as old hypo baths; and we are led to inquire how these old hyposulphites act, and when they become old, or unsuited to good fixing.

The experiments we have undertaken on this subject clearly establish that a solution of hyposulphite becomes unsuited to the permanence of the proof much sooner than is generally believed, and after having fixed only a very small number of proofs it is still capable of fixing a large number of proofs; but this fixing is necessarily bad, and involves the destruction of the proof.

A few facts will make this easily understood. When a solution of hyposulphite of soda, at 10 per 100, has served to fix a proof, and has removed the salts of silver not acted upon by light, it constitutes a solution—not of chloride or of nitrate of silver in hyposulphite of soda, but a double hyposulphite of soda and silver in the same solvent. Now, direct experiment proves that the real saturation of hyposulphite of soda by means of this double salt is very rapidly attained: thus, in placing a solution of hyposulphite of soda, of 10 per 100, in contact with a great excess of recently precipitated chloride of silver, filtering the liquor and abandoning it to repose, we recognise at the expiration of a very short time that a strong proportion of double salt is deposited in the crystalline state, very pure and white. If we then seek to determine the richness of this liquor, which does not alter when exposed to the air, and which must be considered as corresponding to the saturation of the hyposulphite by the double salt, we recognise with astonishment that this solution does not contain at 60° F. more than twenty-seven grains of silver in every litre (thirty-five ounces), which corresponds to thirty-six grains of chloride of silver to twenty-five drachms of new hyposulphite. Now, we know that a whole sheet of paper contains, after sensitising, about twenty-seven grains of chloride of silver only; therefore, when a sheet and a half, previously freed from nitrate by washing in water, is passed into a bath containing a quart of hyposulphite solution of the strength of 10 per 100, the bath will be saturated with the double salt.

It does not follow from this that the bath will henceforth be incapable of dissolving a fresh quantity of chloride or nitrate of silver — far from that; it is still capable of dissolving considerable quantities, and it is in that the danger lies. For, as the crystallisation obtained in the preceding experiment indicates, and as will be shown still better in the experiments we are about to describe, the hyposulphite solution can dissolve much more chloride and nitrate of silver. It is capable of fixing many more proofs; but from the moment it is supersaturated with the double salt, it is in an unstable condition, and tends to return to the preceding stable condition, a tendency manifested by a slow but constant decomposition. The details are as follows:—

If we take a quart of a solution of hyposulphite of soda, of the strength of 10 per 100, and stir into it forty grains of freshly precipitated chloride of silver, the latter will be dissolved, and form the normally saturated solution spoken of above. If to this saturated solution we add a second, and then a third quantity of chloride of silver, equal to forty grains, these quantities will successively dissolve; but the solution will become unstable, and soon deposit, not the double white salt, but free hyposulphite of silver, which is immediately decomposed. This deposit will be slow to produce itself completely, but it will be none the less dangerous to the photographer.

The same result will take place if, instead of adding chloride of silver to the hyposulphite of 10 per 100 strength, nitrate of silver is added. In the first place, and if the quantity of nitrate is small, the hyposulphite of silver formed by precipitation dissolves, and crystals of the double salt are deposited; if, after this, nitrate is added, the liquid will dissolve large quantities of it, nearly two ounces to the quart of solution. The liquid will then have greatly exceeded the degree of saturation indicated, and also be exceedingly unstable. This point arrived at, it will decompose with very great rapidity, depositing, not double salt, but hyposulphite of silver, which, conformably to the reactions indicated in the formulæ *(a)* and *(b)*, will yield sulphur and sulphate of silver. A very abundant precipitate will form in the course of a day, and the supernatant liquor will contain not more than one ounce of nitrate of silver to the quart of bath. At the end of three days that quantity will be diminished three-fifths, and continue to diminish day by day until it reaches the point of saturation indicated above.

We will now endeavour to explain these facts, which it is easy to do. The double salt $(Ag\,O, S^2\,O^2)\ 2\,(Na\,O, S^2\,O^2)$ is dissolved to saturation in hyposulphite of soda. We first add a small quantity of chloride or nitrate of silver; these, more soluble in the hyposulphite than the double salt, dissolve; they then form a new quantity of double salt, which is precipitated in a white condition, as there is nothing to dissolve it. We then add a fresh quantity of one or the other substances: this reacts on the double salt, which is precipitated, or rather is precipitated by a slow action, and decomposed—

a fact easily proved, for experience shows us that by taking pure and white crystals of double salt, it suffices to add to them an excess of soluble salt of silver for a decomposition to take place, sometimes slow, sometimes rapid, according to circumstances, which is manifested by a deposit of hyposulphite, as indicated by the following formula :—

$$(c) \left\{ \begin{array}{l} (S^2\,O^2, Na\,O)^2\ (S^2\,O^2, Ag\,O) + 2\,Ag\,O\,Az\,O^5 \\ = (S^2\,O^2\,Ag\,O)^3 + 2\,Na\,O\,Az\,O^5 \end{array} \right.$$

the hyposulphite of silver, moreover, decomposing according to the formulæ *(a)* and *(b)*.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. XIV.

Nazareth lies in a ravine that falls through the hills to the plain of Esdraelon, the level of which is about three miles distant. This great plain, of which I have before spoken, especially at Haifa, which is on its western coast, runs, in fact, completely across Palestine, from the sea to the Jordan. The plain is a very uniform level from north to south, with a slight ascent from the Mediterranean eastward to the foot of Tabor. This is the summit of the water-shed, and from this it falls eastward to the Jordan and Sea of Galilee. The north side of the plain is thoroughly walled up by almost precipitous hills, which are the last falling off of Lebanon, of which the high peaks commence twenty miles to the northward. One of the bluffs overlooking the plain is the traditionary Mount of the Precipitation, where Christ was led out to be cast down. I think there is not much faith to be placed in the tradition, especially as that hill was in the city, and this is three miles distant.

But from any one of these hills around Nazareth there is a glorious view, and you may well imagine that I have not found eight days too many to drink in the enjoyment of the views of Galilee. From the hill near the tents I have taken views of Cana, Safêd, Tabor, Endor, Nain, Jezreel, Gilboa, Shunem, the Plain of Esdraelon and its various villages, the river Kishon, and Mount Carmel beyond, with the peaks of Lebanon towering in the north, and Mount Hermon, white and glorious, standing in the north-east like a sentinel guarding the Land of Promise, and looking down into the depths of Genesareth, which lie to the eastward, but are not visible from here.

You will scarcely care to hear of the Convent at Nazareth, which was built on the alleged site of the Virgin Mary's House. Many of these places pointed out by the monks are worthy of credit, while others are so manifestly without authority, that to place any confidence in them implies a total submission to the statements of tradition, even in the face of reason. The house of Mary is no longer here. It departed through the air to Loretto, in Italy, a long while ago, pausing on its way somewhere in Greece for awhile. But the grotto under the Church of the Annunciation is curious and worth visiting, ornamented as it is with the gifts of royalty through many centuries. It opens by broad steps up to the floor of the church. Descending these you are in the shrine, and on the spot where the angel met her with the first "Ave Maria." How she came to be in this cavern does not precisely appear; but there is a vaulted passage leading from it to the place which was the kitchen of her house, and it may be that this explains her being in the cellar when the angel came.

The attendant monk pointed out a broken column, the upper part of the shaft hanging from the wall above, and he seemed to think there was something miraculous in it.

I hasten to leave this place. I have nowhere in the Holy Land been more disgusted than I was here with the attempt to locate the events of the life of Christ.

Was it not enough that on these hills the Boy wandered? that His young feet learned here those first tottering steps that led Him afterwards up and down the hills of Syria, a houseless wanderer, without place to lay His head, until He bore the cross up the ascent to Calvary, and they laid His head at last on the rocky pillow hewn for Arimethean Joseph? Was it not enough that this blue vault that overhangs Nazareth once covered the glory of God on earth, and sustained the clouds of countless angels looking down on that sublime mystery, in which they had no part, and of which they had no adequate conception? Was it not enough that here He learned, in accents of this earth's language, to speak that word "mother," hallowed for ever after, a thousandfold, that His lips have spoken it so often, so tenderly, from childhood until His last sad bequest to John the Beloved, at the Cross?

It is an evening of exquisite beauty. The stars shine gently, lovingly, on Nazareth. The picture of the valley from my tent door is exceedingly beautiful. A group of tall and graceful women are filling water-jars at the Virgin's fountain. The other tents are silent. No one moves. The wind rustles the leaves of the olive trees, but there is a hush in the very sound. Selim and Benish-dad lie side by side on the ground, profoundly still. You would think them dead men, such is their perfectly motionless attitude.

Our invalid has been somewhat stronger this afternoon, but toward evening she seemed to fail a little. She has expressed a longing desire to see the shore of Genesareth, and we are very anxious to remove her there if she rally sufficiently to bear the motion. I fear that she will never hear the "music of Galilee's waves" on earth. But there are more musical waters in that country to which she goes. God help us! What pilgrims we all are! D. T.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this society was held on Tuesday, the 6th inst.,—P. Le Neve Foster, Esq., M.A., in the chair.

The minutes of the last meeting were read and confirmed.

After some conversation it was determined that the proceedings should commence with the adjourned discussion upon the Report of the Collodion Committee.

Mr. Heath: Sir, I have a very few observations to address to the meeting upon this question, but as I moved the adjournment of the report, I venture to believe that it may be conformable to the wishes of the meeting that I should commence any observations which should be made upon the discussion.

I have no doubt I shall thoroughly carry the feelings of the meeting and of the committee with me, when I say that I think the acknowledgment of our gratitude is due to Mr. Hardwich for the assistance he has rendered to the collodion committee in particular, and to the society at all times. Not only has Mr. Hardwich taken infinite pains and trouble in the matter—not only has he for their purposes, as we hear, unreservedly laid before Mr. Malone his formula, but his experience and time have been at the command of every member of the committee; in fact, he has done that which he has always done upon all occasions where the interests and progress of photography are concerned. I am anxious to make this acknowledgment because I feel it necessary to take exception to the Report of the Collodion Committee. Let me be quite understood. I do not in the least question the high character of Mr. Hardwich's collodion; in point of fact I am prepared to make the admission that it merits the very highest commendation. Nevertheless I do seriously doubt whether it was wise, or just, or equitable, that that report should have been made at all. Sir, it will be remembered that, at our meeting in this month of last year, a letter was read from Mr. Hardwich asking for the appointment of a committee to report upon his formula for collodion. It will be remembered, also, that at the same meeting the Secretary stated what was the intention of the council with regard to that proposal; and, if I am not mistaken, the same gentleman who presides over us this evening, in answer to a question by Mr. Shadbolt, who had asked for an explanation (he having detected some difference of opinion as to the proper functions of the committee), said as follows:—"He was not aware that Mr. Hardwich entertained any objection to the form of resolution proposed by the council." — (therefore it appears that there was a difference between the proposal of Mr. Hardwich and the resolution of the council.) "The committee would be formed for the purpose of considering any collodions or formulæ for making them which individuals and manufacturers may desire to lay before it, not confining themselves to the one collodion of Mr. Hardwich, but taking a broader basis of operations." Now I turn to the first paragraph in the report of the committee, and I find it there stated, "that Mr. Hardwich, Mr. Mayall, and Mr. Sutton, had sent collodion, but that the two latter gentlemen had not sent sufficient to admit of its being thoroughly tested. Hence, although individual members of the committee had worked with the collodions of Mr. Mayall and Mr. Sutton, the committee in its collective capacity could only pronounce upon that prepared for them by Mr. Hardwich." Sir, it does appear to me that if the committee was formed for the purpose, so clearly and plainly defined by the Chairman, of testing the various formulæ sent in to them by the various manufacturers, and if that purpose could not be carried out, either by failure in sending in formulæ or otherwise, the existence of the committee was at an end — practically it was defunct. Let me reason the question in this way:—A committee was formed at Manchester for testing the various dry and preservative processes; — we recollect the printing committee here; — and very lately the Photographic Society of Scotland, had a committee for testing lenses. Now, supposing each of these matters had been the secret of an individual, I ask, would those committees have been justified, if only one process or one lens had come before them, in publishing a report stating that this process or that lens was the best?—would it not be manifestly unfair and unjust towards others? And yet that is what you are asked to do by the adoption of the last paragraph of the report. The stamp of the approbation of the society is a thing most desirable to be obtained—it is an

honour and a privilege dearly to be coveted; but I hold that a scientific society should well weigh the full consequences of affixing its seal of approbation to anything that may come before it. I have no hesitation in saying that, in consequence of the publication of this report, Mr. Hardwich's collodion will rank in the estimation of the public as superior to that of any other manufacturer. Now, is the society prepared to take upon itself the perpetration of this act of manifest injustice? If so, there will not be a maker of collodion without just cause of complaint. I speak from an experience, based upon the opinions of a vast number of people, and I am taught by that that there are many collodions which can compete successfully with that of Mr. Hardwich; and the observation I have to make now is certainly the most important that I can offer to your notice—it is that, in dealing with this question, you must bear in mind that Mr. Hardwich's collodion is a commercial article, that it is made for sale just as much as Mr. Thomas's or any other maker's. Now it is this commercial element to which I must beg to keep your attention, when I ask you, in the interest of all makers of collodion, not to give a sort of preferential authority to Mr. Hardwich's collodion, because other makers have not thought it consistent with their interests to come forward and lay before you their formulæ. I notice, sir, and I must admit the notice caused me very great regret, that in a foot-note at the end of the report of the proceedings of the last meeting we were referred to an advertisement from Mr. Hardwich, in which he stated his intention to discontinue manufacturing his collodion for sale. Now, I really have no right to interfere with that which is a gentleman's private and individual business, but I do most sincerely regret that determination. I do not comprehend the necessity for his withdrawing from the manufacture of his collodion, simply because it may be said, as I say now, that it is a commercial article. Let his collodion compete on fair grounds with other makers' collodions, and no one will have any right to complain. Now it is because this collodion is a commercial article that I object to the expression contained in the report of its merits; and it may be a bold assertion to make in this room, but I do say, that when members of this society who form a committee come forward with a report which gives a certain preference to this collodion, I, as a member of this society, have a perfect right to come forward and say upon my experience that there are other makers whose collodions are superior. I scarcely know whether it is right, but I, at all events, will not use this society for the purpose of mentioning particular names; though I think I may venture to state my own experience with the collodion of one maker during last summer (I will be particularly guarded in not mentioning names), and I only refer to it because I think that if a report of this nature is to be made and adopted in the transactions of the society, the experience of myself and others should take their places by the side of it. I have by my business engagements but little opportunity to practice photography; but I think some time in February of last year I took home twenty ounces of collodion, and between February and November I may have taken perhaps a dozen pictures. I think I may probably be able to show negatives taken within that time which shall be deemed satisfactory—at all events, whether I worked in March or November, the exposure given to my plate—making of course an allowance for the difference of light and temperature—was as nearly alike as possible. I mention this for the purpose of saying that I cannot help thinking that a collodion of this nature must be far more serviceable and valuable in the hands of all, but especially in the hands of amateurs who only work occasionally, than a collodion which so speedily loses that quality which is so essential, namely, its sensibility; and I must ask you just to bear in mind this fact when you are legislating upon the question—accidentally I use the word legislating, but I think I am right, for your decisions come to in this room are rules of guidance for those who are not present, and, therefore, if the society say that a collodion of a particular maker is of superior excellence (for those are the words used), I think that is clearly laying down a rule for the guidance of those who are not present.

I have a very few more words to add, and I sincerely apologise for having kept you so long. I regretted to notice that only two-thirds of the names of the committee were attached to that report. I have the greatest respect, I may say, the greatest admiration for the names of the committee who have signed it; nevertheless, I think that I should have felt less strongly upon the question, and others would decidedly have felt less strongly, if the names of the other members of the committee had been there also; and, probably, I am somewhat influenced in my opinion by knowing that one gentleman who was on the committee, and whose name is not attached to the report, agrees with me in my opinion with regard to the value of that particular maker's collodion I have just referred to. I do not mention his name, for I am quite sure the meeting will credit my assertion. The gentleman alluded to is very highly respected, and a most careful and painstaking manipulator. I think, if the committee had looked at the matter, and merely judged it in its business bearings, that they would have hesitated before presenting a report upon one collodion, when the committee was formed for the investigation of a number of collodions.

With regard to Mr. Hardwich himself, I trust that he will see that the few remarks I have made are founded upon good, sound, and logical reasoning; at all events, if I fail in convincing him in that, I trust I shall not in this;—that the necessity I have felt for making these observations does not in the least affect the very high estimation in which I hold Mr. Hardwich for his productions, and the great services he has rendered to photography

Mr. Sebastian Davis: Sir, I think there is a very tangible reason why a report should have been given upon Mr. Hardwich's collodion, and with that impression I venture to make a few remarks upon the subject. It may be in the recollection of some few members that it was determined that no report should be given, and no collodion examined, unless it were accompanied with a full and detailed account of the formulæ for making it. Now, I conceive it would have been quite possible for Mr. Thomas to come forward, or any other maker, if he had wished, and describe his formulæ. If I understand the question, we are here a body of gentlemen met for scientific purposes, and it is upon those scientific principles that we investigate and are called to decide upon the different formulæ. It certainly seems to me that as only one collodion was placed in the hands of the committee they were compelled, in justice to the gentleman who prepared that collodion, to give a distinct report. I think, therefore, it would have been an act of injustice to Mr. Hardwich to have refrained from giving an opinion upon his collodion after examination.

Now, passing from this question, let us consider the collodion itself, its manufacture, and its properties. Taking the general report, I am inclined to think that it may, without doubt, be considered to be very good as regards its adhesion to the glass and the easy way in which it flows over a large-sized plate. I have tested some which Mr. Hardwich has been kind enough to forward to me, and it has this advantage; and I think we have thus gained a great point, because, undoubtedly, all those experienced in collodion must know that it is most difficult to arrive at a satisfactory formula in that respect.

Now, passing to the use of iodide of potassium in iodising collodion, I think that iodide of potassium alone is not the best salt for iodising collodion; the reason for which is apparent, and is, that iodide of potassium in solution is more prone to decompose the ether and alcohol in collodion than any other of the salts in use except iodide of ammonium. Iodide of potassium has, generally speaking, when prepared in a pure condition, an alkaline reaction; now if we add ether to it we shall find the decomposition taking place without the addition of the pyroxyline. If, on the other hand, we make an iodising solution of a different kind, the mixed fluids remain colourless for any length of time. I do not think that the iodide of potassium alone produces a sensibility equal to that of other collodions which may be purchased in the market at the present time. I think that the committee have made two or three anomalous statements. They assert, in the first instance, that the collodion in sensibility is unsurpassed; and they state also that Mr. Frith, at a temperature of 130°, was enabled to take moving figures with this collodion; but I remember a remark he made in this room, when he returned from the East, that he found his own collodion too sensitive, and that he had to counteract that by adding acid to his bath. If you take portraits in a medium light, you will find that the evidence of gentlemen is contradictory as to Mr. Hardwich's collodion in preference to others. Mr. Delamotte says he has found Mr. Hardwich's collodion very sensitive. Again, Mr. Williams and Mr. Morgan, I think, and some other gentlemen on the committee, state that in portraiture they do not find it so sensitive, but conjecture that this may perhaps be accounted for by the employment of citric acid in the developer. Citric acid in the developer! Why, a collodion to be tested against another collodion must be tested under precisely the same circumstances, and in this instance I have no doubt this was done. I bring forward these facts, not with reference to Mr. Hardwich's collodion in particular—no one has a greater respect for that gentleman than I have, and this society and the photographic art are indebted to him for his formula, freely given to us all—but I think that there has been, up to the present time, no published formula given for collodion equal in sensibility to those known sensitive collodions which may be found in the market. I trust that the committee, which is still in existence, may receive some assistance by which this one point may be got over, and then it will be in the power of all members to make their own collodion, or have a practical knowledge of how a collodion can be made; and the experience they obtain in making it will be a great benefit to them, and they will gain in scientific knowledge by the investigation of this interesting subject.

Mr. Delamotte: I should like to correct the last speaker in something he has just stated. I think that the report which I sent in was not quite fairly quoted by Mr. Davis. In the report I believe I remarked that I should wish, if possible, that the collodion might last for a longer time in the iodised state. I did not complain of any want of sensitiveness in the collodion when I first used it.

Mr. Sebastian Davis: I referred to the sensitiveness of the collodion after it had been mixed, say three weeks in the summer. My own conviction is, that a collodion may be made very sensitive by using a different iodising compound.

Mr. Watson: I am happy to find that we have come to a more thorough knowledge of Mr. Hardwich's formula than formerly; because, when the resolution for the appointment of this committee was come to, I find by the Journal that Mr. Sebastian Davis stated "that he had, within the last week, carefully examined the formulæ given for the manufacture of pyroxyline in the last edition of Mr. Hardwich's *Manual*, and found that, with the materials he had used, instead of obtaining a satisfactory pyroxyline at the temperature stated, the cotton dissolved more like

lump sugar than cotton; and it appeared that the recommended quantity of oil of vitriol was decidedly in excess. He merely stated this to show why it was desirable that when gentlemen communicated details, they should have an opportunity of defending themselves. He knew full well that many communications had been made to the society by gentlemen, and yet other gentlemen with a considerable amount of photographic knowledge had not succeeded in following out their views, although they appeared to be exceedingly explicit and clear. Therefore, he for one would advocate the appointment of a working committee to test the particular formula laid before the meeting. Under those circumstances, there must be a full and clear and precise description of the whole process, from the beginning to the end, so that any other operator shall be able to succeed in the same manner, because it was known that science was based upon exact principles, and all must arrive at the same result." Now, it seems that Mr. Davis has no difficulty at the present time with the formula; therefore he must either have misunderstood it in the first instance, or have received further information, and it is desirable that this should be clearly explained. On looking over the report I do not find that the committee have taken the trouble to examine any formulæ. There is no formula stated of Mr. Sutton or others. They might have ascertained whether by the formulæ given they could have made the collodion similar to the samples sent in. Now, I should like to read to the meeting what was stated as being the decision of the council; and this will be found in the last March number of the Society's Journal:—"The secretary stated that the council had considered Mr. Hardwich's proposition, and resolved that a committee of the society should be appointed to examine and report on the various formulæ for making collodion; and that members of the society and makers of collodion be invited to send samples of collodion, such samples to be accompanied by a statement of the manner of their manufacture." Now, we have had no report of that description. Mr. Davis is not singular in being unable to produce a collodion from the formula which was sent in. I have heard more than one state that they have tried and failed. I have heard one gentleman, who is second to none in London as a practical chemist, say that he cannot make collodion of any description by the formula. I think that the collodion of other makers might have been accepted under the same condition as Mr. Hardwich's, inasmuch as his formula was not examined.

Mr. Hughes: Query.

Mr. Watson: There is no account of such examination.

The Chairman: May I call your attention to the last paragraph but one, to the effect that Mr. Malone has examined the formula in its chemical aspect, and is satisfied with it.

Mr. Watson: That was not in the first report sent round to the members. [This was a mistake of the speaker, which elicited the general dissent of the meeting.]

The Chairman: I do not know of any report but that which appeared in the Journal.

Mr. Watson: Well, there was another sent out; and I want to know at whose expense these slips of paper which are circulated among the members are published?—whether at the society's expense, or at the expense of the party about to read the paper?

The Secretary: From the first establishment of the society it has been customary to send round a slip to the members of the council, and to such gentlemen as might probably take part in the discussion. The type having been already set up for the Journal there is only the expense of pulling the proofs. [The Secretary appeared to be about to continue the explanation, but was stopped by a sudden burst of applause.]

Mr. Watson was about to further argue this matter of expense, when Mr. Shadbolt rose to a question of order.

The Chairman said: I did not like to interfere, for I thought the gentleman would not be very long, and that we might lose time in endeavouring to stop him.

Mr. Watson: With respect to the latter part of the report, the committee state that the collodion which they have examined is superior; but they do not say to what it is superior, and superior is a comparative term—scarcely, I think, a proper word to use, seeing that they had nothing to compare that collodion with. If they had examined the other samples—if they had made collodion from the other two formulæ sent in—they might then with propriety have stated that this collodion was superior to the others.

Mr. Morley: It really appears to me (begging the gentleman's pardon for interrupting) that we should understand the matter better if the formulæ alluded to were brought before us. I therefore move that Mr. Hardwich's paper be now read.

Mr. White seconded the motion, which was duly put and carried.

Mr. Hardwich then, at the request of the Chairman, read his paper [see page 76], and afterwards stated that an error had crept into it which he wished explain. He had worked for more than a year with one thermometer, but before reading his paper he thought it desirable to ascertain whether this thermometer was correct. It appeared, on comparing it with another and more expensive instrument, that it was five degrees too low all the way down the scale, from 170° to 100° Fahrenheit. To be quite sure, however, he had afterwards sent the instrument to an eminent optician, who compared it with his standard thermometer, and wrote back to say that it was remarkably correct, even to the fraction of a degree, and that the other thermometer must have been wrong. The temperature at which he worked would therefore be correctly stated at 150° F., instead of 155°.

The Chairman: It is my duty to invite discussion upon this paper of Mr. Hardwich's; but before the discussion begins, I have to announce that Dr. Becker has been unanimously elected an honorary member of this society.—(Applause.)

As no one rises, I will take the opportunity of saying a few words with regard to a paper Mr. Sutton has sent to be read this evening. He imagined that this would be an evening in which we should have an opportunity of reading it, and he was anxious that it should be inserted in the Journal, and afterwards to have a discussion upon the subject at our next meeting—the subject being Mr. Sutton's New Panoramic Lens, of which you have a specimen on the table.

Mr. Heath: Having, sir, made the remarks which I did at the commencement, I shall intrude myself upon you for a very short time. I may be permitted now to say, I owe it to Mr. Hardwich that I should propose that the best thanks of the meeting be given to him for the paper which he has read. I look at that paper in a totally different light from the report; and I do think our thanks are due to Mr. Hardwich, as they would be to any other gentleman who might come into this room and give us his advice and assistance. Mr. Hardwich has done this upon all occasions, and he has again done it in this laborious and painstaking paper. It is gratifying to me now to move that the best thanks of the society be voted to Mr. Hardwich.

Mr. Watson seconded the motion, which was duly put, carried, and acknowledged.

Mr. Heath: May I ask, now, whether it is supposed that the report of the collodion committee is taken and adopted?

The Chairman: I do not know that it is adopted by the meeting. The report is received, and the meeting has expressed its views. I do not think that there is any adoption by the society generally.

After the chair was vacated, Mr. Malone stated that he and several members of the committee had come to speak in defence of the report, but the Chairman said it was then too late.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

An ordinary meeting of this Association was held at Myddelton Hall on the 29th ult.,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the previous meeting having been read,

The Chairman called on the members to nominate officers for the ensuing year.

Mr. Legg recommended that a record of the attendance of each member of the committee should be furnished next meeting, to guide members in voting. Agreed to.

In the absence of the gentleman who was to have read a paper, Mr. Barber read the following letter from Mr. Oakeshot, of Ryde:—

Ryde, *February* 15, 1860.

Dear Barber,

I see by The British Journal of Photography, received this morning, that you presided at the last meeting of the North London Society, and that the subject of discussion was a paper, read by Mr. Hughes, on the *Alkaline Gold Toning Bath*, particulars of which, I suppose, we shall have in next number of the Journal. I observe, also, that Mr. Hardwich was present, and that, in his remarks, he stated he had used one fixing bath of hyposulphite of soda all through last summer. On reading this, I was not a little surprised to find that no one present called attention to the experiments of the French chemists, MM. Davanne and Girard, on this very point.

These experiments, if correctly given, seem to me all important, as they appear to throw especial light on that annoyance to photographers—the gradual change of paper prints; and they will perhaps, in some measure, explain why certain prints seem permanent and others transient, when, according to appearance, all were treated alike.

Messrs. Davanne and Girard assert positively that a quart of hypo solution of ten per cent. in strength will fix only one and a half sheets of paper; this in plain figures means, if my calculation be correct, that four ounces of crystallised hypo will only just fix ten pictures, $8\frac{1}{2}$ by $6\frac{1}{2}$; then this number of prints will saturate the above quantity of hyposulphite of soda with hyposulphite of *silver*, and if more than this number of prints be passed into the same solution, there is a certainty that an injurious element will be left in the paper, and, sooner or later, infallibly destroy the print. Can not you, at one of your meetings, call attention to the subject, and have it a little ventilated? I fancy that most photographers expect more work out of hyposulphite, even when new, than (if these chemists are right) it seems able to give. I noticed also, in the same number of The British Journal of Photography, a letter from Mr. Hardwich, about economically working the alkaline gold bath, by precipitating the unused gold with protosulphate of iron. I manage mine more simply than that. Instead of reducing it by iron, I leave it to reduce itself as it likes, and use the same solution over and over again, merely adding a little fresh gold with each fresh lot of prints, and occasionally also a little more carbonate of soda. I find this plan answer quite as well as making a new lot each time; the inside of the bottle becomes gradually coated with a black deposit of gold, which can be easily recovered again by dissolving it in a little nitro-muriatic acid. I do not think I have anything more in particular to say just now. I shall look anxiously into the journals to see what some of the great guns in photographic chemistry have to say about the Frenchmen's notes on Fixing. I shall be glad to learn your idea about it. I hope you are preparing for a photographic trip, and, should you chance to come this way, I will do my best to give you welcome.

Yours truly,

Mr. J. Barber. C. OAKESHOT.

Mr. Hughes said that Mr. Oakeshot greatly misunderstood Mr. Hardwich's observation. Mr. Hardwich used an almost saturated solution of hyposulphite of soda rendered alkaline—not for six months, or for any stated time, but he added continually fresh crystals of hyposulphite of soda, thus constantly renovating it; and as a proof of its freedom from sulphuretting action, an old bath of this kind would not *tone* a print, even if it were left in it for some considerable time. It was a common fault to use a solution not sufficiently strong to fix the prints. This fault might be recognised by looking through the print, when it would be found to be covered with measly spots in the fabric of the paper, which did not occur when a strong or weak solution was used newly mixed.

With regard to the second part of the letter, he thought, judging from the colour of the deposit on the bottle, that it was owing to the presence

of oxide of silver, and expressed an opinion that as much would be lost as gained by the repeated use of the same gold solution, owing to the increased rapidity and extent of decomposition.

Mr. Barber inquired whether a black deposit appeared in the hypo bath by keeping?

Mr. Hughes said there was nothing but what might arise from dirt—nothing resembling a black sulphide of silver.

In reference to the appearances presented by prints which had been imperfectly fixed,

The Chairman thought Mr. Hughes in error in stating that the measly spots were only to be found when using an *old* weak fixing bath; he had purposely experimentally produced them with fresh hyposulphite. When he first noticed those singular marks which Mr. Hughes had called "measly" spots, he had fancied from their yellow colour that they might be sulphur; but this was not the case, as he had found them totally unattackable by bisulphide of carbon, which, had they consisted of sulphur, would most assuredly have dissolved them. He did not attribute them to chloride of silver left in the paper, but rather to some compound formed with the partially dissolved starch with which the paper was sized. He had found that, when once these measly spots had formed, placing the prints in even a saturated solution of hyposulphite of soda would, so far from removing them, only tend to increase their extent.

Mr. Hughes agreed with the Chairman that the spots were not chloride of silver. He thought it probable that they were to be attributed to a too dilute bath, and had some experiments in progress with a view to ascertain the minimum strength at which the bath could be employed without the spots making their appearance.

Mr. D. W. Hill thought it unadvisable to use the gold bath over and over again—that when properly managed the amount of gold left was very minute. If a small number of prints were to be toned a less quantity of gold might be employed, and if it toned too slowly it might be warmed.

Mr. Dawson, on being asked to give the result of his experience, said that the process used by him was identical with that of Mr. Hughes, and that Mr. Wilson, of Aberdeen, used it also, the only difference being that Mr. Wilson used fresh hyposulphite, while he (Mr. Dawson) used a saturated solution, which he kept neutral by the addition of chalk, great care being necessary in warm weather, or when the bath is exposed to heat, he having found an alkaline bath to become acid in ten minutes on one occasion, when he had placed it on a stove. When the hypo bath is kept it should be in a cool place. He thought a large quantity of gold was wasted by some operators, and considered that by warming, half might be saved. Mr. Wilson, of Aberdeen, used fifteen grains for toning thirty or forty prints. He (Mr. Dawson) dissolved fifteen grains of chloride of gold in a gallon of water, and added as much carbonate of soda as would cover a sixpence: in cold weather he warmed it on a sand bath, and found it would tone four hundred stereoscopic prints. Papier Rive would not give black tones, but with Saxe paper any degree of blackness might be obtained.

The Chairman said that one important subject had not been alluded to—that was washing: he considered that most people washed their proofs for far too long a time, and that one hour was sufficient if they proceeded upon correct principles. In taking the prints out of each quantity of water, he hung them up to drain till nearly dry before putting them into fresh water, and continued changing till the last drop from the corner ceased to have a sweet or metallic taste.

Mr. Hill, being pressed for time, suspended his prints in a deep vessel, turning the tap on them, and drawing off the water from the bottom by means of a siphon; he left them all night.

Mr. Shave said that the evils of long washing were admitted, and mechanical means had been suggested to obviate them.

The Chairman thought that mechanical washing had been proposed more with the view of saving trouble.

Mr. Dawson had never observed any change to be produced in prints toned by the alkaline gold process by any length of washing, although he had in those toned by the old hyposulphite of soda. He agreed with the Chairman that the washing might be accomplished in much less time, provided that care were taken to prevent the prints from sticking together. He placed, say one hundred stereoscopic prints in a dish holding two or three gallons of water, stirred them round well, then drained off the water closely, and repeated this six times. He then changed the water two or three times in the next two hours, by which time he considered that the hypo was effectually removed.

Mr. Hughes said some other fixing agent than hyposulphite of soda might be found: he did not think the resources of chemistry were exhausted. It was comparatively a short time since hypo was first used by Sir John Herschell, who was still living.

The Chairman had with others successfully used ammonia, but it was very unpleasant to manipulate with.

Mr. Dawson said ammonia removed the albumen.

The Chairman said it did not do so after the latter had been coagulated with nitrate of silver.

Reference was made to M. Humbert de Molard's fixing with cyanide of potassium saturated with iodine. Also to the different colours of gold deposit.

The Chairman announced that, in accordance with the rules, the officers for the ensuing year were to be nominated at the present meeting, for election at the annual meeting on the 28th March.

The names of several gentlemen who had been nominated to serve on the committee were then handed in.

Mr. Hare exhibited a very portable binocular stereoscopic camera, the body of which collapsed, on the bellows principle, the focussing being effected by means of a screw, and the bottom of the camera serving as the top of the tripod stand.

The Chairman exhibited some stereoscopic slides of *Fountains Abbey*, &c., by Mr. Woodward, of Nottingham.

Several members regretted that these well-executed specimens had not been taken with a bi-lens camera, it being evident, on a very casual inspection, that they were not.

Mr. Shadbolt also exhibited some stereoscopic illustrations of a collection of five hundred gems, ancient and modern, by Mr. Rodgers, of Montrose, and some other subjects by the same operator. These were much admired, and several present noticed the peculiar pseudo-scopic effect produced by viewing the representations of the gems upside down.

The meeting, after assuming a conversational character, was then adjourned to the 28th instant.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 7th instant, at the Rooms of the Literary and Philosophical Society, 36, George Street,—Mr. Parry in the chair.

The Honorary Secretary read a letter which he had received from Mr. J. A. Forrest, of Liverpool, stating that the Liverpool Society of Fine Arts had decided to open in April next an exhibition of works by eminent ancient and modern artists, among which was to be included an exhibition of photographs, and asking for contributions from the members of this society: the Liverpool Society would bear the expense of carriage.

Mr. W. T. Mabley presented five large and very beautiful photographs to the society's portfolio, taken by the collodio-albumen and wet collodion processes.

The Hon. Secretary also laid upon the table a print from a negative taken by the panoramic lens, and which was presented by Mr. Samuel Cottam to the society's portfolio.

A vote of thanks was passed by the meeting to Mr. Mabley and Mr. Cottam for their donations.

The Chairman exhibited several very beautiful paper negatives taken by him about six years ago, which were much admired for their sharpness, &c.: they were on Canson's plain paper, and waxed afterwards. He said the process was one of the ordinary ones; but if any member wished for particulars of it he should be very happy to give them. He (Mr. Parry) hoped that more attention would be given to waxed-paper, as he believed the process to be capable of more than was generally supposed. He intended to give it a trial next summer.

Mr. Sidebotham exhibited a very compact stereoscopic camera, which was very much admired for its lightness, construction, &c.; also a very convenient form of bag for changing plates in the field. He then called the attention of the meeting to the fact that one of their members (Mr. James Mudd) had obtained the prize medal at the Exhibition of the Photographic Society of Scotland, for the best photographic landscape. He thought it was a subject of great congratulation to them, particularly as it was taken by the society's favourite dry process—collodio-albumen. Mr. Mudd's picture was one of several of his which had been much admired at the exhibitions both of London and Edinburgh for their great beauty: the Manchester Society had cultivated this process with great success, and had a long time since issued a report on its superiority over all other dry processes, by a committee specially appointed to test the relative merits of the various processes.

The Chairman remarked, that Mr. Mudd had been requested by the Photographic Society of Scotland to read a paper on the collodio-albumen process, and had written one which was read at their last meeting, and he (the Chairman) thought the remarks made upon it by one of the members of that society very uncalled for.

Mr. Mudd, in explanation, said that the reason he had spoken in his paper of *introducing* the process to the Photographic Society of Scotland, was because, on looking over the catalogue of the society's exhibition, he found that the collodio-albumen process was only represented by one member of that society (a lady), and consequently he concluded that if they happened to know it in theory, they evidently did not in practice.

In reply to a question, Mr. Wardley said he had once been successful in developing a collodio-albumen plate with sulphate of iron, but on subsequent trials he did not again succeed.

Several other members said they had only been able partially to succeed in developing collodio-albumen plates with iron.

The Chairman stated that in the process of etching steel at their works they obtained occasionally very large crystals of proto-nitrate of iron, which will keep some time in the crystalline form. He had given some to Professor Crace Calvert, who had expressed great surprise, and promised to give his opinion respecting them.

Mr. Mabley said it was quite unknown to chemists for the protonitrate of iron to remain in the form of crystals more than a very short period.

The Chairman promised to bring some to the next meeting.

Mr. Sidebotham exhibited some very beautiful stereoscopic transparencies, taken on plates which he said were easily prepared, and rapidly

printed and developed. His experiments with the process by which he had produced them had been, so far, very successful; but he preferred waiting until the next meeting, and making further trials before giving the process publicity.

The Secretary of the society brought the subject of the Photographic Exchange Club before the notice of the meeting. He had now nine names down, and should be glad to receive any others. Non-members were equally admissible with the members of this society. A committee would be formed to carry out the club. Any negative above the size of half-plate to be admissible; or, if members of the club liked to contribute stereoscopic pictures instead of large ones, two stereoscopic pictures would be considered equal to one large photograph.

After a very agreeable and interesting meeting, the proceedings closed with a vote of thanks to Mr. Parry for his services in the chair.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

At the monthly meeting of the members of this society, held on the evening of Tuesday, the 28th ult., Mr. Haines in the chair,

Mr. W. B. Osborn, one of the Vice-Presidents, delivered an address

On the Serio-Comic Aspect of Photography.

He remarked, that so much had been said or written on the subject of photography as to make it difficult for one to say anything new about it; but, as far as he was aware, the aspect in which he was about to view photography had never been made the subject of a paper. It frequently happened that that which was a very serious matter to a photographer, appeared essentially comic to a looker-on. When a young man, for instance, taking a fancy to photography, purchases his instruments and chemicals, and forthwith proceeds to take likenesses of all his friends and of everything within his reach, including his cat and dog and the nearest brick wall, the energy with which he goes to work is amazing. But in a little time he begins to experience a disappointment here, and a failure there, and finds that matters do not go on so smoothly as when his apparatus was new. The blunders he is making cause him much anxiety, and are, of course, a serious matter to him, though to the looker-on they simply suggest how comical it is that a young man should bother himself so much about anything of the kind. But the advanced photographer is sometimes no better off. Having carefully prepared a number of dry plates, and gone a long journey in search of the picturesque, and brought home (as he thinks) a number of beautiful transcripts of scenery, it is intensely comic to watch his serious expression when he finds his developer develops nothing but a lot of spoiled pieces of glass. Then every one knew how comical it was to come in contact with "the unfortunate photographer." He is always in trouble. He never can manage to take any picture whatever. He has either over-developed or under-developed; over-exposed or under-exposed: he has either neglected to keep his plate in the bath long enough, or forgotten to put it in the bath at all; or, if he goes out, ten to one but he has forgotten his bath, or taken with him an empty collodion bottle, or dropped his developer by the way. But, as if to compensate for these mishaps, nature has produced "the universally successful photographer." He never has a failure, and spends half his time in letting the photographic world know it, though, singularly enough, he and the photographic world usually hold different opinions on the point. There is also "the enthusiastic photographer," who is always going to do some wonderful thing, but never does it; and the "grumbling photographer," who never can take a picture himself, and can never see a beauty in the pictures of anybody else—who sees too much shadow here, and too much light there, and who usually forsakes the practice of photography altogether in disgust, saying that it is unworthy the notice of any one having the least taste for art. The "curiosities of photography" were another source of serio-comic study. What endless portable tents that were not portable, unless with the assistance of a man and boy! What huge mistakes in the shape of developing boxes! What wonderful cameras, which were almost to take pictures by themselves! What demonstrations that unless you use the very last lens out there is no use your attempting to take a picture! A great deal of this was pure humbug. He (Mr. Osborn) did not see that they had very much improved upon the old lenses. As for baths, he did not see why their old gutta percha friends should be discarded altogether because glass baths had been brought out, liable as these were to break and lose half-a-gallon of solution. A writer in one of the journals was for making every photographer an amateur mechanic, and, if he succeeded, the dealers in photographic stores would probably pass him a vote of thanks; for as soon as a man commenced dabbling in amateur mechanics, so sure was he to spend double the amount that he might get the same article for from a respectable house, and the result would be nothing but disappointment. As connected with the serio-comic aspect of photography he (Mr. Osborn) spoke of the gin-and-water process, the raspberry-syrup process, — the former of which, he thought, was liable to the objection that "it won't keep." One of the serious aspects of photography was the extent to which it was followed as a business on Sundays, and the lecturer expressed a hope that the various societies throughout the kingdom would endeavour to put down the practice. In conclusion, he narrated some amusing adventures which had happened to himself and friends in their ardent pursuit of photography under difficulties, forming a fitting close to the series of serio-comic sketches.

The address occupied nearly an hour in the delivery, and of course the above report is a mere summary of the leading points.

On the motion of Mr. Brown, seconded by Mr. Ball, a hearty vote of thanks was passed to Mr. Osborn, and the same compliment was paid to the chairman.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

This newly-formed photographic society held its first ordinary monthly meeting on Thursday, the 1st instant,—John Kibble, Esq., president of the society, in the chair.

The Chairman delivered a very beautifully conceived and chastely expressed inaugural address, on the present position and prospects of photography.

Mr. A. Mactear, one of the Vice-Presidents, read a paper *On the History of Photography in Glasgow.*

A discussion ensued on the conclusion of Mr. Mactear's paper, in which Professor J. Taylor, Messrs. Kibble, J. Spencer, sen., J. Stuart, Ewing, Hugh Wilson, J. Cramb, &c., took part.

The Secretary announced that Messrs. Cramb Brothers had been successful in producing photographs on ivory, not artificial but real ivory, and laid untouched specimens, and others highly finished in colours, on the table for inspection, and which were handed round and much admired. Mr. Cramb intimated that for the present the manner of production would not be disclosed.

The meeting, which was a large one, seemed fully to answer in the affirmative the question, "Was a photographic society required in Glasgow?"

Exhibitions.

PHOTOGRAPHIC EXHIBITION AT LIVERPOOL.

We beg to remind intending exhibitors at the forthcoming Exhibition of Photographs in connexion with the Liverpool Society of Fine Arts that contributions should be delivered to the London Agent, Mr. James Bourlet, 10, Foley Street, Portland Place, W., not later than the 19th instant; or at the Exhibition Rooms, Queen's Hall, Bold Street, Liverpool, not later than the 24th instant. Mr. J. A. Forrest, 58, Lime Street, Liverpool, will gladly supply any further particulars required.

As no exhibition of photographs has taken place in the "capital of the North" since 1854, the coming display is looked forward to with much interest by all admirers of the "new art," and also by those who take an interest in art generally. It is to be hoped that the rapid progress made in the photographic art, during the eventful six years which have elapsed since the first and only exhibition held at Liverpool, will be distinctly marked by the pictures forwarded for the approaching exhibition.

ARCHITECTURAL PHOTOGRAPHIC EXHIBITION.

[BY OUR SPECIAL REPORTER.]

A visit to this exhibition confirms an opinion that has been growing upon us for some time, that architecture is the field in which photography displays its greatest strength and power. In the microscopic detail, in the strength and transparency of the shadows, and in the faithful delineation of every variation in texture, colour, and form of the object represented, we have a combination of artistic qualities denied to the artist of the pencil. Then the sober hues of the subjects, and their limited range of colour, render architectural photographs more faithful than those of other objects.

The value, to the professional architect, of such a collection as that now exhibited, must be beyond all calculation; while to the amateur or mere photographic collector, it must possess an interest, arising as much from the subjects as from the fidelity of representation which the mode of producing them secures. This exhibition displays an advance in excellence upon that of last year. Manipulation in photography has become, comparatively, so certain in its results, that the photographer has had more leisure to cultivate the artistic element of his art, and he has well improved the opportunity. At length justice has been done to the architect as well as to his work; and in these views, so intelligent, as a rule, in their recognition of the resources and capabilities in *chiaroscuro* of the noble originals, we are glad to forget the bald representations by untutored photographers of former years.

We must not be thought wanting in patriotism if we say that the artistic element is most conspicuous in the productions of our Gallic neighbours. Messrs. Bisson Frères, in our judgment, bear the palm. By their long experience in this department of art they have gained great mastery, and their noble views of *Strasburgh*

Cathedral are alone sufficient to make us exclaim enthusiastically, "We, too, are photographers!" These views forcibly recal the sensations of delight and surprise we experienced at witnessing the wonders of the diorama painted by the creator of photography, Daguerre. Pity it is that he did not live to see these triumphs of the art to which he gave birth! They are truly dioramic; thus distinguishing them from the productions of the artist or the engraver. Architectural drawing was fast disappearing, when photography flashed upon us with the new power imparted by collodion, and now, we think, few artists would be bold enough to enter the lists in competition with the photographer.

The photographs in this exhibition are judiciously classed by countries, although the various nations are very unequally represented. France and England are greatly in the majority, as might have been expected: next follow Spain, Rome, Venice, Jerusalem and its neighbourhood, Constantinople, Germany, Switzerland, and the Netherlands.

We feel impelled first to notice the comparative merits of the various photographers whose works constitute this collection. And here we are again struck with the strong individuality each photographer can impress upon his works, which is quite as marked and distinguishable as the style and touch of the painter. Beside the works of the artists already named, those of Messrs. Cundall and Downes stand in close relation, from similarity of subjects and artistic excellence. Their *Views at Rouen* are worthy of the subject, displaying true artistic feeling and a full appreciation of the capabilities of the object. The *Views in France*, by the French artists, are interesting from variety in the subjects selected. The *Tower of St. Jaques de la Boucherie, Paris*, and the *Hotel de Cluny*, are exceedingly interesting. Not less so, but from a very different cause, are the *Ruins of the Roman Theatre at Arles*, the *Palace of the Popes at Avignon*, and the *Walls* of that city, a curious specimen of mediæval fortification, now utterly obsolete. Rich and rare, as specimens of Gothic architecture, are the portals of the *Cathedral of Rouen*, of *Chartres*, of *Notre Dame de Paris*, *Bourges*, *Amiens*, and the *West Front of Saint Ouen* at Rouen. The *Staircase of Francis the First at St. Blois* is a very striking architectural picture: the staircase is external, full of bold relief, in shafts, balustrade, and panels.

Next in order comes the *Doorway of the Cathedral at Berne*, also by M. Bisson; it is an exceedingly interesting subject, exhibiting a combination of French and German styles.

Jerusalem and its Neighbourhood is depicted by Messrs. Robertson and Beato, forming an exceedingly rich collection. There is the *Village of Bethany*, looking very much like a deserted village; the *Walls near Akra*, the *Damascus Gate*, the *Sion Gate*, and the *Tower of David*—with all of which we seem as familiar as with the public buildings of London, so accurately and picturesquely have they been described by travellers. As photographs, they are truly excellent. The points of view are chosen with much tact, and are very suggestive in such views as the *Wailing Place of the Jews*, part of the old walls of the Temple looking stern and chill, while the narrow street ends in a brief vista, suggestive of a ray of hope. There is a *General View of Mount Scopas*, upon which the eye might dwell, actively occupied, for an hour. The rock tombs of *St. James and Zacharias* are highly picturesque. Among the striking pictures of this series is the *Mosque of El Aksa and the Mount of Olives*, with the two gloomy cypresses standing within the quadrangle. This is a very remarkable picture. There are several pictures illustrating the Mohamedan localities of Jerusalem, which possess too much merit to admit of their being passed by unnoticed; in fact, they are deserving our highest meed of praise. There is a series of eleven views of Constantinople, by the same artists, very interesting with respect to subjects, and very excellent as photographic pictures. The *Fountain of the Sultan Selim* seems as if it had grown on the spot at the command of some magician.

Mr. Macpherson contributes six views of Rome, very charming and interesting, making us wish there were more of them. We must, however, specially single out *Ruins of the Baronial Stronghold of Nepi*, which is a most exquisite gem of photography—so bright and clear, yet so deep and rich in tone and colour. The subject possesses very great interest, and has had full justice done to it by the artist.

The most important to many in point of interest, but the worst in execution, are the views in North Italy, by Signor Ponti. The Signor has either much to learn in manipulation of the art or he has adopted a vicious system of developing, which gives his pictures a cold, dry, opaque aspect.

Mr. Clifford contributes a few Spanish scenes, but so few as to be quite tantalising. A country so rich in architectural beauties should have been more liberally represented at this exhibition. His *Temple of Diana at Merida* is the best of his contributions, so very superior to the others, in fact, that we wonder how the same artist could have produced them.

Among the English scenes the productions of Mr. Melhuish, Mr. Robertson, and Mr. Cade, stand conspicuous. Mr. Robertson's fifteen views of *Ludlow Castle* will form a rich addition to the architect's portfolio. Mr. Melhuish's view of the *High Street, Oxford*, is the best we have seen of that subject. Mr. Cade's *Hengrave Hall* is a very excellent picture; and his series of *Lichfield Cathedral*, and of *Haddon Hall*, place him in the first rank of photographers.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII.

The principles which guided you in the use of black and white only are just as necessary for your practice in using colours, and I therefore hope you will not neglect the instructions contained in the last chapter. But although the gradations of colour are quite as delicate and imperceptibly soft and harmonious as those of light and shade, still there is this great difference, that while in the one case you merely strengthen or weaken the single tint in use, in the other every change is not only a change in the quality of light or dark, but also a positive change in tint or colour. Now, in changing the tone of a colour, or in any way altering its character, it is important to keep all your hues, whether nearly pure or frequently "broken,"* clean and fresh. You must therefore, in mixing your pigments, select such as will not only produce, by mixture, the requisite tone, tint, or hue, but you must be careful to mix such only as blend kindly together, so as to produce a clean and pleasing result (to assist you in doing this, I gave in a former chapter a full description of all the pigments more commonly used, with their peculiar qualities in reference to this aim). When, however, the peculiar effect desired cannot be obtained by merely mixing the pigments, one is hatched or stippled over the other. For instance, should you desire to preserve the purity of a delicate colour, and yet subdue its brilliancy, you will secure this by hatching over the same with, say blue, because certain minute but undetected portions of the colour over the whole surface retain their original purity, although an equal portion of the same is subdued, and two colours which would not work kindly together when mixed in solution are thus harmoniously blended without muddiness or manipulatory difficulty.†

If you have adopted the plan of these instructions, you ought now to possess some knowledge of the scientific theory of colour, of the chemical and working properties of your pigments, of the principles which rule the practice of our best artists, and of the importance of light, shade, and reflections. You ought to know how to preserve the truthfulness of a photograph, how to strengthen and increase their more prominently artistic qualities, how to wash (don't joke), how to hatch (pray don't), and how to stipple—consequently we may at once commence practice with water-colours.

THE PHOTOGRAPH.

Select a good one. Don't let it be a flat, white-faced image; but tell the printer of that same specimen to produce you a faint delicate picture, with as little black as possible, and with all the gradations of shade unaltered. Of course the printer will look at the negative before he promises to produce such a proof; but if the negative be satisfactory, he can do it with a little care and the use of a little wool; and your persuasive power must make him say he will.

A pale warm grey is the best colour for the print, and it can be got with ease on both the plain and the albumenised paper. The whites should be as pure as they can possibly be preserved. It should be mounted, with gelatine or thin glue, on good stout London board, and (unless you have a machine yourself) sent to the hot pressers to be rolled (not *hot* pressed).

* Colours are said to be broken when mixed, or, in other words, not pure.
† This remark is equally applicable to "glazing," in oil.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

G. A. HILL.—The specimens are good, and at the prices named would, I have no doubt, procure you employment. Your only mode of proceeding would be by advertisement or personal application. The black and white chalk specimen is a novelty; but a better effect might be got on a rougher surface with less labour.

CHIAROSCURO.—You must begin with a much fainter touch; the lines are too decided, the hatching much to angular; the back-ground may be left untouched if it is of a colour similar to your touched figure. Any amount of artificial light may be obtained by the aid of various coloured screens, and a looking-glass placed obliquely to the light. See Chapter II., and a paper read by myself at a meeting of the South London Society.

J. B., Cheltenham.—Your question is of so business-like a character, and so purely of a private nature, that you should have enclosed your address for a written reply. With our worthy Editor's kind indulgence, however, I may just add that I will undertake to tint them for you in exchange for the landscape specimens, if the latter are good. Send your address.

ANABEL.—See the answer to "Chiaroscuro."

ANOTHER STUDENT.—The colours too pure, giving a raw and bleeding effect to the flesh, and the effect is altogether too hard and wooden-like. See reply to "Chiaroscuro." I cannot add more until the subject of water colours has been fully treated.

R. L., AMATEUR NO. 2, ROSE, ALMA.—I must trouble these correspondents to read the replies given to "Chiaroscuro" and "Another Student," and the maxims given in a former chapter.

AN ARTIST.—The name (rightfully possessed) will always prove a safe passport to my sympathy. The varying phases of hope, despondency, satisfaction, discontent, and despair, are, in the course of every true artist's experience, so acutely felt, and so little understood by the good folk outside our little circle, that a fraternal bond of kindly and considerate feeling ought always to unite us, and I really think does so, despite occasional appearances to the contrary. In common fairness I cannot occupy the valuable space of this excellent Journal with the lengthy advice you require, but I will give it you personally, or, if you send me your address, by letter. Perhaps I shall be able to aid you in procuring specimens to practise upon.

A BEGINNER.—See my remarks upon the preparation of the photograph.

Foreign Correspondence.

Paris, March 10, 1860.

The Abbé Despratz has resumed his essays on collodion, which have been interrupted during the past year by indisposition. He dwells upon the instability of every kind of collodion, no matter how much its unchangeableness may be vaunted. The most apparent characteristic of the spontaneous change collodion undergoes is a diminution of sensibility. Feeble during the first few weeks, it at length becomes more decided, so that the production of a portrait becomes almost impossible. Besides loss of sensibility, time effects another most serious inconvenience in loss of tenacity in the film. Every kind of collodion appears finally to lose much of its tenacity, becoming so rotten that the film breaks up in every direction, and leaves the glass in the sensitising bath. Sometimes a collodion of good quality, when first made, will continue to give unexceptional pictures so long as the film is in the wet state, but as soon as it dries, it appears full of holes, and mottled all over.

Almost every collodion assumes, in course of time, an amber tint, which becomes deeper and deeper, even if kept in perfect darkness. This discolouration proceeds, it is supposed, from a quantity of iodine being set free. Therefore it is recommended to neutralise this free iodine, either with a few drops of ammonia, or by immersing a piece of zinc in the collodion. This expedient slightly weakens the amber tint, but never restores the olive oil colour it possesses when first prepared.

The loss of sensibility may vary greatly in different samples, even when prepared according to the same formulæ, and with the same care; but still, after the lapse of time, the sensitiveness will almost entirely disappear: we know of no means of restoring it. It is of no use endeavouring to turn such collodion to account by giving longer exposure, for it gives only a weak, indefinite stained picture on the plate. A collodion in this condition appears to have lost a portion of its iodide, gradually separating from its original combination to form a new one, which gives rise in the nitrate bath to a compound less photogenic than iodide of silver. For, if a few drops of iodised alcohol be added to such a collodion, it again becomes capable of giving vigorous proofs, at least for a time.

Tenacity can be restored to very old collodion by the addition of a certain quantity of pyroxyline.

The holes and streaks that sometimes appear in very old collodion are often due to the alcohol and ether used in its preparation being insufficiently rectified. When the rectification is properly conducted, the spots and streaks are much later in making their appearance—sometimes several months, but they finally show themselves in case the ether and alcohol are nearly absolute. It is only a question of time, but it may be stated as a general fact; for, up to the present day, we have never met with a sample free from this defect. Is it too bold a surmise to say that the continuous reaction of the constituent principles of collodion at last results in the formation of a little water?

M. Nièpce de Saint Victor has favoured us with a further instalment of his researches on light. This time it is the action which electricity, either alone or combined with light, exercises when it renders substances in the state of aqueous solution capable of reducing the salts of gold and silver. If the elements of a single galvanic pile are put into a cold solution of nitrate of uranium, this yellow salt is changed into a green salt, which, according to M. Peligot, reduces the salts of gold and silver.

A cold solution of tartaric or citric acid, in which the same galvanic elements are placed, also reduce chloride of gold.

If the platina-conducting wires of an electric pile are plunged into red wine, the wine changes in colour, becomes more alcoholic, and, if sparks are eliminated in the wine, it acquires an empyreumatic taste.

White wine, containing much sugar, submitted in like manner to the electric current, loses all its sugar, and becomes much more alcoholic: this result is the reverse of that produced by the agency of light.

But it is remarkable that all these solutions quickly lose by agitation the property of reducing the salts of gold and silver, or by a long repose in the open air: the green salts become yellow again.

We will now note the effects produced by electricity and light united. If a slightly acid solution of nitrate of uranium with the elements of a single pile placed in it be exposed to light, the liquid becomes troubled, and a violet precipitate is thrown down, mixed with subnitrate of uranium. The liquid reduces the salts of gold and silver very energetically. This violet precipitate, which is formed only under the influence of light and electricity combined, resembles in colour and properties the colouration produced by the action of light upon a sheet of paper impregnated with nitrate of uranium, which paper loses the colour it has acquired after a time, if kept in the dark.

This violet precipitate is turned green by potassa; and with an acid it resumes its original colour, and is eventually dissolved. If the elements of a simple pile are placed in a solution of oxalic acid and nitrate of uranium, or of the yellow oxide of uranium of commerce (uranate of ammonia), a disengagement of electricity naturally takes place in the dark; but if the apparatus be exposed in a white glass vessel to sunlight, bubbles of gas (carbonic oxide) will be liberated, causing an ebullition, if slightly agitated, and the force of the electric current is greatly augmented. If the oxalic acid be in excess—as it must be for the pile to act long—oxalate of zinc is formed at the bottom of the vessel. The action of the pile is not necessary for the solution of oxalate of uranium to produce a disengagement of oxide of carbon, under the influence of light, but electricity increases the action of light, as light augments the action of electricity. Neither electricity alone, nor heat (at least, if it is not above 212° F.), can produce a disengagement of oxide of carbon in the solution of oxalate of uranium. According to his experiments, light changes the nature of oxalic acid in the same way that it renders absolute alcohol very sugary, and reduces its strength several degrees; whereas, under certain conditions, electricity converts sugar into alcohol. J. P.

TO OUR AGENTS AND READERS.

In consequence of numerous applications the number of this Journal published on the 1st of January last (being No. 103), lately "out of print," has been reprinted, and may be obtained either direct from the Publisher, or through the London, Provincial, Colonial, and Continental Agents of the Journal.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

RECOVERY OF SILVER FROM A SPOILED NITRATE BATH, &c.

To the EDITOR.

SIR,—Will you please to inform me of a means to recover the silver from a nitrate bath which I have spoiled in the following manner:—Owing to the bath fogging, I added a saturated solution of carbonate of soda, until there was a slight deposit, then filtered, and put it in a glass dish, within a pan of water, to boil for awhile. Having to leave it for a few minutes, on returning I found the dish had split, and that the whole contents were as black as ink, with a dense deposit, a part of which I enclose you. The pan was coated with tin and full of common water.

Answers to the following will likewise oblige:—

2nd. To recover the silver from old pyrogallic developing solution.

3rd. To recover the gold from old hypo and gold baths, and from old bath by Mr. M. Lyte's formulæ; with a ready method to convert the same into chloride again.

Having, from time to time, seen the clear and straightforward manner in which you answer those needing your help, I have been induced to send you the above.—I am, yours, &c.,

ONE OF THE THANKFUL.

[We have roughly examined the powder sent, and find it to consist of metallic silver, oxide of tin, organic matter, and chloride of silver. Your best plan will be to boil it in one ounce of nitric acid diluted with four ounces of water, in order to dissolve out the silver and the organic matter: oxide of tin, and chloride of silver will be left behind, the latter being present in small quantity. The nitric acid solution of the silver will be very impure, and must be precipitated by salt. If you have any large quantity of the chloride, it may be reduced by means of zinc, but if the quantity be small, it will be better to throw it into the hyposulphite fixing bath, to be separated as sulphide, by means of sulphide of potassium, when enough has accumulated.

2nd question.—Waste developing solution will reduce itself, if we may be allowed the expression. You will find the metallic silver at the bottom of the vessel.

3rd question.—Procure sulphide of potassium at an operative chemist's, and add it to the fixing and toning bath, as advised in the last number of our Journal. Treat Maxwell Lyte's bath with sulphate of iron, by a process recommended in the last Journal but one.—Ed.]

TRANSPARENT STEREOGRAPHS.

To the Editor.

Sir,—In printing glass (transparent) positives for the stereoscope, and where it is intended that one surface shall be grey (or ground), is it usual to print them on that plate of glass which has both surfaces polished, in which case the picture is necessarily inverted—right for left—except when viewed through the greyed surface? It appears to me that, by coating and printing on either the greyed or plain surface of *the greyed glass*, that this inversion might be avoided. I have had a dozen transparencies sent me, *all inverted.*—I am, yours, &c., T. G.

[Instead of contact printing, those specimens produced by aid of a lens can be done upon either the upper or under glass without inversion. The objection to printing on the smooth side of the ground glass consists in the ground side (which is then outwards) being soiled by handling, so as to display offensively the finger marks. M. Ferrier, whose stereographs are so highly valued, prints upon *plain* glass, and produces the effect of ground glass by means of a subsequent coating of pure wax dissolved in ether, or a spirit varnish *chilled* in drying.—Ed.]

BLACK STREAKS.

To the Editor.

Sir,—I observed in reading the report of the "Collodion Committee," that some of the members speak of "narrow black lines in the direction of the dip." I have met with these when using collodion by various makers, but more frequently with Mr. Hardwich's. I attribute them to a quantity of the nitrate bath collecting above the plate on the dipper, which, while draining, runs over the surface of the plate after detaching it. The remedy is simply to elevate one corner of the plate in withdrawing the plate from the bath, bringing it out diagonally, so as to allow the solution to run along the top and off at the lower corner.

I noticed that these streaks always commenced at that edge of the plate which was uppermost in the bath.

Can you inform me why, having taken in the Society's Journal from the commencement, I have not received a copy of M. Joubert's picture so long promised?—I am, yours, &c. D. W. HILL.

5th March, 1860.

[We believe that the distribution of the promised plate has been delayed by the unfavourable state of the weather for printing.—Ed.]

A "TRICK" IN PHOTOGRAPHIC PRINTING.

To the Editor.

Sir,—Your critic of the Photographic Society's Exhibition passes the bounds of his vocation when he accuses me—or gives currency to the accusation, which is the same thing—of producing effects of atmosphere by a "trick."

The courtesy which one gentleman extends to another should have prompted him to give me credit for common honesty sufficient to prevent my attempting so gross a fraud.

I cannot do more than offer to show the negatives to any one doubting the truth of my pictures.

I trust you will be able to find space for this note.

I am, yours, &c. LYNDON SMITH.

Leeds, March 2, 1860.

[We are personally responsible for the critique complained of, but cannot perceive any reasonable ground of complaint. We quote the passage *verbatim*:—

"We have been told that the aqueous-looking atmosphere does not exist in the negative, but that it is an effect produced in the printing by what has been decried as a 'trick.' We do not perceive, by the way, the justice of such a designation. If it be a 'trick' it is a clever one, though in our opinion in the instances cited carried to an unreasonable and detrimental extreme; with somewhat less of straining after effect, the operation, whatever it be, might be very probably beneficially applied."

The above is the assertion of a *fact*: we were told what is stated, and by more persons than one; but more, we objected to the designation "trick," and even defended the practice, as the above extract shows.

Our correspondent's assertion is undoubtedly quite sufficient, without the *experimentum crucis* proposed.—Ed.]

THE PREPARATION OF ALBUMENISED PAPER.

To the Editor.

Sir,—For some time I have felt a desire to add fluoride of sodium to my chloride solution, used in preparing albumenised paper; but delayed in consequence of seeing in a contemporary that fluoride of silver would not be formed on the paper by this method, but must be produced by the addition of fluoride of silver to the sensitising bath.

As I am no chemist, I wish to learn from you whether the addition of fluoride of silver would add to the sensitiveness of the albumen paper? and also how fluoride of silver can be easily made? if it will dissolve easily i the nitrate of silver bath? &c.

Can you help me to get a real ebony black in my albumen prints? I have brown, violet, slate black, &c., but not pure black.—I am, yours, &c.

A READER FROM THE FIRST.

Glasgow, February 29, 1860.

[Unless you are very expert in chemistry and photography, we advise you to have nothing whatever to do with the fluorides. Fluoride of sodium in the paper would certainly form a portion of fluoride of silver during the sensitising; but this compound being soluble in water, would tend to dissolve out into the bath, and not to remain entirely in the paper.

Fluoride of silver has been used in the negative nitrate bath, and is said to give extreme sensitiveness in some states of collodion; but it is a substance of doubtful utility, and very prone to cause universal decomposition on applying the developer to the film.

With reference to the "ivory black" on albumenised paper, it may be obtained by the alkaline gold toning bath (but only on some kinds of paper), and by printing deeply from an intense negative. Buy paper from four or five different makers, and try a sheet of each: if the fixing bath has been some little time in use, so much the better for the ebony black tints.—Ed.]

ANSWERS TO CORRESPONDENTS.

R. G.—Yes! the same.

Isis.—It is an old process revived.

Querist (Leamington).—Apply to Murray & Heath, Piccadilly, London.

Economist.—By one of Derogy's patent lenses. See advertisements.

Dubious.—We have *some* hope of M. Joubert's process,—none of the other you mention.

L. L.—We cannot tell how that particular collodion is made. You must risk your money, and abide by the result.

Otway.—The mauve colour is obtained from coal tar, and so are many other beautiful pigments. They are quite permanent.

Green-hand.—Make your glass house as large as convenient, and avoid cross lights It need not be an expensive arrangement.

Samuel G.—Positive printing by development is all but obsolete. You will find it very difficult to succeed with it.

Tom Tucker.—For a young beginner you are in too much haste. You must serve your apprenticeship to photography as well as to any other craft.

F. S. W.—We do not see anything amiss in either of your negatives, as evinced by the prints sent; we rather prefer the *bracket* of the two, but both are very good.

T. C.—A little ammonia would be an improvement in your plate-cleaning liquid: it serves to remove grease, which alcohol, not being a solvent of fats, sometimes fails to effect.

T. A. Bedford.—You must take your chance if you send them: we can promise nothing till we see them. We always act with strict impartiality to the best of our knowledge and belief.

F. S. W.—We find the following formula to succeed as a negative developer:—Sulphate of iron, ten grains; glacial acetic acid, thirty minims; water, one ounce; or in place of the glacial acetic acid, Beaufoy's acetic acid, one-and-a-half drachm. It will be occasionally necessary to intensify the image with the ordinary pyrogallic acid mixture and nitrate of silver.

J. W. Y.—Study the paper on collodion which appears in this number. The formulæ for the preparation of the bath, given in the various manuals of photography, are generally to be relied on; but do not omit to buy *the best* nitrate of silver, or all will go wrong. Twenty minims of glacial acetic acid, with one grain of pyrogallic acid and an ounce of water, will answer your purpose as a developer.

S.—White glass certainly. In your glass room described, there is *not* enough glass. The part opposite to the sitter should be of glass, both top and side, but especially the top. The place occupied by the sitter will do of wood, as you have arranged. Opaque glass is very objectionable: clear glass, with blinds, for occasional use, are far better. Remember that you want to vary the direction of your shade according to circumstances: for instance, the more prominent the features of a sitter, the more you require the light to be in front, and *vice versa.*

Received.—J. K., Rev. A.M., Israel Holdsworth.

*** Several interesting articles, some in type, are unavoidably postponed for want of space; amongst them the continuation of Mr. Grubb's series "On the Optical Centre," and Mr. Forrest's paper "On Glass;" also Professor Roscoe's lecture "On the Measurement of the Chemical Action of the Solar Rays."

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 115, Vol. VII.—APRIL 2, 1860.

A very interesting observation has been recently communicated, through the pages of a contemporary, by Mr. F. Maxwell Lyte, a gentleman whose name is deservedly familiar amongst photographers, from the numerous suggestions of acknowledged practical value which have emanated from him, as well as for his skill as a photographic manipulator. It not unfrequently happens that alleged facts of an extraordinary character are asserted in the most positive manner without any real foundation; and this occurs, not from any want of good faith in the promulgator, but arises rather from incapacity for correct observation: it therefore becomes a matter of considerable importance, in order that a surprising assertion shall meet with ready acceptance, that its sponsor shall be one of known ability and integrity — such, in fact, as is the case in the present instance.

The curious phenomenon which Mr. Lyte has recently recorded, is the effect of a low temperature in materially reducing, or altogether destroying the solvent quality of hyposulphite of soda, as regards the haloid salts of silver, thereby rendering it inert as a fixing agent for positive proofs upon paper. The strength of the solution of hyposulphite of soda employed is not mentioned; but it is stated by Mr. Lyte that, during the very cold weather which prevailed in the middle of last February, proofs immersed therein, instead of becoming fixed, suffered from a double decomposition, by which sulphide of silver became deposited in the interior of the paper—in fact, that the proofs were disfigured by what Mr. Hughes, in a paper recently published in these columns, termed *measly spots.* That the effect was due to lowness of temperature appears to be pretty conclusive, as the *same solution*, on being again heated to a temperature of between 60° and 70° Fahrenheit, fixed pictures perfectly. This will probably throw some light on several hitherto unexplained failures.

At the last meeting of the French Photographic Society, M. Bertsch gave a simple and lucid explanation, in a popular form, of the defects necessarily dependent upon the employment of an uncorrected condensing lens in an enlarging camera, as adopted in the instrument known as the solar camera. To this objection we made some allusion some time back when treating of the camera in question, simply pointing out its effect without entering into details of the cause: we shall, therefore, in an early number, place M. Bertsch's communication before our readers. Judging from the excellent specimens of photo-micrography, the production of this gentleman, which we have seen, we have little doubt that he is well acquainted with microscopical manipulation, and it is consequently not at all surprising to us that he should take the same view of the solar camera as we do; in fact, it would be quite impossible for any one who has had much experience in working with the microscope to fail in perceiving that, in the enlarging camera, no novelty of principle whatever is involved, and that, in the particular construction before alluded to, needless errors of practice are introduced. In his communication, M. Bertsch offers a suggestion relative to the addition of a concave lens of glass of the same dispersive power as the condensing lens, in order to restore parallelism to the rays prior to their being allowed to pass through the negative to be enlarged, so that the two are arranged somewhat after the manner of the object lens and eye lens of an opera-glass. An instrument upon this plan is in course of construction for M. Bertsch, and we shall be glad to learn the result of a trial of its operation; but we fear that the gain anticipated by the condensation of the light in this manner will be almost balanced by the loss from absorption by the glass and reflection at the four surfaces. The idea is, however, certainly an ingenious one.

We have not unfrequently been applied to for an explanation of and remedy for the existence of a foggy-looking spot in the centre of the plate, when taking negatives of landscapes with a portrait lens, with the diaphragm between the parts of the combination. As the season for active operation in the field is now fast approaching, it may not be amiss to take the question into consideration at the present time, particularly as we observe that a correspondent of our elder contemporary, the *Journal of the Photographic Society*, offers, in the last issue of that publication, a supposed explanation, which he regards as perfectly satisfactory, but in which we certainly do not concur. This gentleman supposes the offensive spot to be an *image* of the aperture in the diaphragm, which he thinks is sufficiently demonstrated by the fact that the form of the spot corresponds with the form of the aperture as observed by altering the shape of the latter, and also that the position of the diaphragm affects the sharpness or definition of the spot. The reflections of light at the various surfaces of the lenses, as supposed by this correspondent, who adopts the designation "Onward," are quite insufficient to account for an *image* of the aperture in the diaphragm, though it is just possible that they might explain the existence of a *shadow* of the diaphragm. The case cited of the number of images of a lighted candle seen when a portrait lens is pointed towards it, is not analagous, the position of the object (in this case the candle) being altogether different.

If in "Onward's" case there were an image of the aperture at all, it must have been due to reflection from the front surface of the front lens alone, which, as regards the diaphragm, would act as a concave mirror; but, to form an image, the diaphragm itself must have been capable of readily radiating light—a clearly improper condition for the diaphragm to be in, as it should be of a dead black. But we are of opinion that, as a rule, this is not the cause of the annoyance We account for it by supposing it to arise from the shade in front, with which portrait lenses are usually furnished, and which are generally far too small in diameter, thereby cutting off a portion of the light falling on the lens obliquely in every direction, and thus a shadow of the diaphragm itself becomes projected on the focussing screen, and consequently the indistinct outline of the aperture therein is sufficiently traceable. Such a shade as we have indicated is worse than none at all, and may be with advantage removed altogether; and for the purpose of taking landscapes with portrait combinations, with a central stop, we are by no means sure that it would not be a good plan generally to renounce the front shade entirely. The only precaution to observe would be to be quite certain that the interior of the tube is properly coated with a dead black substance of an appropriate kind.

ON THE OPTICAL CENTRE.

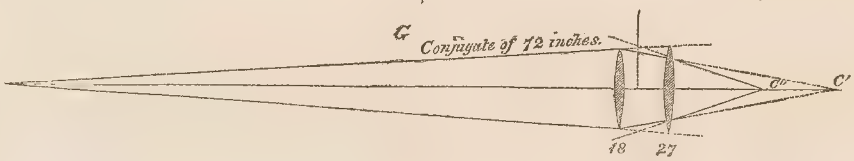
By Thomas Grubb, M.R.I.A.

No. III.

The several cases of "open compounds," exhibited by the diagrams marked A to F in my last communication, and published in your Journal of 15th February, were selected from a number of others as being at once instructive and varied. I shall now add a case which represents pretty closely one of our standard whole-plate portrait combinations, which, on examination, proved to be nearly as follows:—

Focus of first combination, 18 inches; focus of second combination, 27 inches; distance between these, 5 inches.

Neglecting the short distance between the two lenses forming the back combination, we have the representative of the whole combination (sufficient for illustration) in the following diagram G.



This diagram, it will be seen, represents the combination as applied to form conjugate foci; but let us first assume that the combination is applied to parallel rays, as in case B (February 15). We find from the formula there given the equivalent focus of G for parallel rays in either position of the compound to be 12·15—or say, P = 12·15 inches.

I have purposely avoided adopting the general symbol "F" for the equivalent focus, because our ideas of focal length are usually associated with something fixed or definite, and it is common to speak of the focus of a portrait combination as measured from some part of the construction. There is no objection to the use of the word focus, or its representative F, for the focus *for parallel rays*, which we not only know to be a fixed quantity for any compound, but which, also, we have shown to remain the same for such rays in the reversed position of the compound. "P" is to be understood to represent, throughout, *the power of a combination*, or the equivalent focal power which the compound under examination exerts *under the precise circumstances* "*pro tem.*" P therefore will be, in the case of parallel rays, equal to F (but not in any other) for the open compound.

Having found the value of P for parallel rays for the compound represented by the diagram G, it is required to find the distance of the image from last lens. Retaining the notation given in the last paper, then,

- l, l', &c., 1st, 2nd, &c. lenses of a combination.
- d, d' their intervals.
- c First conjugate or distance of object from first lens.
- c' Second conjugate or distance behind first lens, where the image of c would be formed if second lens were removed.
- c'' Third conjugate, or the component of both lenses l and l', measured from last surface.

This formula will do for any number of lenses and distances, the last or final conjugate being C''.

Now, when the incident rays are parallel, c' is equal to the principal focus of the first lens (or f), and

$$\frac{1}{c''} = \left(\frac{1}{f-d}\right) + \frac{1}{f'}$$
$$\left(\frac{1}{18-5}\right) + \frac{1}{27}$$
$$= \frac{1}{13} + \frac{1}{27}$$
$$= \frac{1}{8.775}$$

Or, if we reverse the compound, l and l' change places, and

$$\frac{1}{c''} = \left(\frac{1}{f'-d}\right) + \frac{1}{f}$$
$$= \left(\frac{1}{27-5}\right) + \frac{1}{18}$$
$$= \frac{1}{22} + \frac{1}{18}$$
$$= \frac{1}{9\cdot 9}$$

We thus see that, although the power or P is the same *for parallel rays* in reversed positions of the compound, *the distance of the image from last surface here varies.*

The diagram G, however, represents the combination as applied to form *conjugate foci*, the distance of the object being 72 inches from first lens, and the formula will be—

$$\frac{1}{c'} = \left(\frac{1}{f} - \frac{1}{c}\right) \text{ and } \frac{1}{c''} = \frac{1}{f'} + \left(\frac{1}{c'-d}\right)$$

So that, for the direct position of the compound—

$$\frac{1}{c'} = \left(\frac{1}{18} - \frac{1}{72}\right)$$
$$= \frac{1}{24}$$

and

$$\frac{1}{c''} = \frac{1}{27} + \left(\frac{1}{24-5}\right)$$
$$= \frac{1}{27} + \frac{1}{19}$$
$$= \frac{1}{11.15}$$

That is, for an object placed at 72 inches from the first lens of the combination, the image will be formed at 11·15 inches behind the last lens.

We are now in a position to find the equivalent power or P for these conjugate foci of our combination in a manner which depends for its correctness on the proposition that *the power of either a lens or a combination of such, no matter how complex, is duly expressed by the final vergencies of the pencils.*

The data previously ascertained enables us to calculate these vergencies as follows:—

For the compound represented in fig. G—

$$V = \frac{1}{c} \quad \text{and} \quad V' = \frac{1}{c''} \times \left(\frac{c'-d}{c'}\right)$$

so that

$$V = \frac{1}{72} \quad \text{and} \quad \begin{cases} V' = \dfrac{1}{11\cdot 15} \times \left(\dfrac{24-25}{24}\right) \\ \quad = \left(\dfrac{1}{11\cdot 15} \times \dfrac{19}{24}\right) \\ \quad = \dfrac{1}{14\cdot 1} \end{cases}$$

The vergencies are therefore as 1 to 5 (very nearly), and the images are inversely as these, or as 5 to 1.

Having thus obtained the proportions of the conjugates, their actual lengths are found by taking the entire distance, say 72 + 5 + 11·15 = 88 15 inches, and dividing this into two parts in the proportion of 5 to 1, thus we obtain—

Distance from first conjugate to conjugate centre, 73·46 inches.
Ditto second, ditto ditto 14·69 ,,

And, for the value of P, or the equivalent power—

$$\frac{1}{P} = \left(\frac{1}{73.46} + \frac{1}{14.69}\right)$$

Or P is equal to 12·24 inches.

We have now obtained not only the equivalent power of the combination G, but also *that point in the axis which is the more immediate object of our research, viz., the centre of the conjugates*; that is to say, for the combination under the precise circumstances in which it has been considered.

I shall now give two other methods of finding such a centre. One is a mixed method, or partly by calculation and partly by diagram, and is as follows:—

First, calculate by the formula already given the place of the second conjugate c', and of the final conjugate c'' for any given (first) conjugate c.

Next, draw the outer rays of the pencils in accordance with this data, as shown in diagram G, either of full size or to a convenient scale.

Thirdly, produce the lines showing the outer vergencies, until these lines intersect, and let fall a perpendicular from the point of intersection to the line representing the axis of the compound. The point where this perpendicular touches the axial line is the centre sought. This is shown by the dotted lines in diagram G; and if a similar process be adopted with the previous diagrams, A to E, we shall find them as in the following table :—

Diagram.	Foci of Lenses.	Distance Between.	How placed or circumstanced.	Conjugates formed.	Equiv. Power or P.	Place of conjugate centre. From First lens. From Last lens.
A	24 & 24	12	Rays parallel between lenses	24 and 24	12	6 and 6
B	24 & 21	,,	Incident rays parallel	Par. and 16	16	4 and 8
C	12 & 24	,,	Ditto ditto	Par. and 12	12	12 and 0
D	24 & 12	,,	Ditto ditto	Par. and 12	12	6 and 6
E	12 & 24	,,	First conjugate 12 inches	12 and 24	8	4 and 8
F	24 & 12	,,	Ditto ditto	21 and 21	10½	9 and 3
G	18 & 27	5	First conjugate 72 inches	73·46—14·69	12–24	1·46 and 3·54

This table, if assisted by a reference to the diagrams, needs no explanation. It will be observed that the four cases, C to F, are all the *same compound*, but exhibited under different applications.

The third method of finding a centre of conjugates is altogether practical, and may be conducted thus:—

Provide three planed boards, say eighteen inches long, nine wide, and one thick, also a couple of bridges or forked pieces of wood to support the compound for examination steadily on the upper board, so that its axis shall be directly over a centre line drawn on the length of the upper board. Fix to the centre of the lower board a projecting pin, so that the two upper boards can be turned steadily round on that centre; and mark the place of this centre on all the boards by traverse lines on the faces and edges of the boards. The lens is to be placed as directed on the upper board, and as nearly as can be judged with the conjugate centre over the pin or centre of revolution. A suitable object (a lamp or candle by night, for example) being now placed at that distance from the compound for which the conjugate is required, and either a ground glass or a cardboard surface being placed on an independent support (that is, unconnected with the support of the lens) to receive the image, then the lens with the two upper boards is to be turned round while the image on the screen is watched. Should this image remain unmoved by the revolving of the compound, then the centre of the conjugates is found, and may be marked on the compound from the cross line on the upper board, supposing this to coincide with the centre of revolution; but should the image shift to right and left as the compound is turned with the upper supporting boards, then shift the upper board with the lens longitudinally, thus bringing another part of the compound over the centre pin, and try again. After a few trials, for each one of which the distances of the object require adjustment, a position for the compound will be found for which no sensible alteration of the place of the image takes place on revolving the compound through an arc as large as its own aperture permits. The position of the conjugate centre will now be had by reference to the line on the middle board. It may be seen that the experiment can be conducted by two boards only, shifting the compound with the supporting bridge pieces.

The centre of conjugates thus found will agree with the same obtained by the theoretical or mixed process, and satisfactory proof of the change which the place of these centres undergoes will be had by trying the experiment for both a considerable and inconsiderable distance, say for distances varying between ten to three times the focus of the compound.

We are now in a position to judge of the nature of these centres. They are, in my estimation, nothing more than those places where, according to circumstances, the power exerted on one side meets the power exerted on the other—*a neutral point in fact*, and one which, practically, can be extended into a line of indefinite length wherever (as in diagram A or E) the rays pass parallel within the compound; a point in this line being however necessarily taken for the conjugate centre which divides this line proportionally with the outer conjugates. We therefore have here no *a priori* evidence that the place (or places) of these centres is better than another for placing a limiting diaphragm, while other considerations show that a different place may be decidedly preferable. A knowledge of the centres, which have been the subject of the present investigation, is, however, of considerable value in theoretic considerations, and it affords the means of finding the representative of any compound (however complex) in the shape of a single lens of definite aperture and power—a matter of no slight value in strict comparison. In my next communication on this subject I hope to examine the Petzval or orthoscopic, and also the symmetric (so called) compounds, with reference to these centres.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 1.

It has often occured to me, that if one accustomed to read the photographic journals from the very commencement were, from time to time, to make short notes of anything which struck him as being worthy of comment, it would be of service: amateurs just beginning the art would derive advantage from such discussions; whilst the advanced student might perhaps be encouraged to communicate his own experience, and so to add to the general stock of knowledge.

In the last number of this Journal, under the head of a Report of the Proceedings of the North London Photographic Association, I see a letter written by Mr. Oakeshot, of Ryde, referring to an analysis made by the French chemists, who assert that a quart of hyposulphite solution, of a strength of ten per cent., will fix in a satisfactory manner not more than a sheet and a half of washed sensitive paper, and that the above solution will be in a state of super-saturation with silver salt, if more than forty grains of chloride of silver be added to it. Now all this is so directly opposed to the everyday experience of photographers that it must evidently be wrong.

When Herschell first published his memoir on the hyposulphites, he described two compounds of hyposulphite of silver with hyposulphite of soda—the one containing one atom of the former salt to two atoms of the latter, and the other containing a single atom of each. If you dissolve in a solution of hyposulphite of soda rather more than one-third of its weight of chloride of silver the former of these compounds is obtained, which is very soluble in water, and has an intensely sweet taste; but if afterwards a fresh portion of chloride of silver be added to the same solution, until the weight of chloride reaches to more than one-half of that of the original hyposulphite, then the second compound is produced, which is far less soluble than the last, and not so sweet to the taste. Thus, a quart of hypo solution of ten per cent., containing four ounces of hyposulphite, ought to dissolve an ounce and a half of chloride of silver to make the sweet salt, and more than two ounces of the sparingly soluble salt.

To bring the above calculations to the test of actual experience, I took commercial hyposulphite of soda and analysed it by means of iodine, to ascertain the per centage of real hyposulphite present. A solution of ten per cent. was next made, and in two similar portions of this fixing liquid, containing each fifty grains of hyposulphite, twenty grains and thirty grains of nitrate of silver were respectively dissolved, the solutions being put away in separate bottles, in a dark place. The experiment was made on Saturday, and on Monday morning both solutions were found perfectly clear; but at the bottom of the bottle containing the hyposulphite solution most highly charged with silver a brilliant crystal had formed, perfectly transparent, and with clean cut faces, like a diamond of the purest water. Any one may repeat this experiment, but it will be necessary to take one precaution — the nitrate of silver must be converted into chloride by the addition of common salt, otherwise it will be impossible, even with the most careful stirring, to prevent some decomposition. It is therefore certain that commercial hyposulphite of soda ought to take up at least a third of its weight of chloride of silver, and to produce with it a liquid not prone to immediate decomposition, although, as I showed some time back in a paper read at the Photographic Society, any solution of hyposulphite of silver in hyposulphite of soda will tend eventually to throw down the black sulphide, and to form products analogous to the polythionic or sulphuretting series.

The photographer need not, I think, concern himself practically with this question, since he will never be able to push the action of the hypo fixing bath to the degree of saturation above mentioned. It must be borne in mind that the compound which he has to remove from the paper is not pure chloride of silver, but a compound of chloride of silver either with albuminate of silver, or with that substance which I term gelatino-nitrate of silver, which is not affected by washing with cold water. A much stronger fixing solution is required to remove these bodies than theory would indicate for simple chloride of silver, and hence, unless crystals of hypo are occasionally dropped in there will be yellow measly spots in the substance of the print visible on looking through it, although the fixing bath may be capable of readily dissolving freshly precipitated chloride of silver in the curdy state, and of retaining it in solution without any precipitation of sulphide. I do not think that MM. Davanne and Girard would be able to defend their own statements if called upon to do so; and it appears to me that, as regards the practical working of the fixing bath, a

short letter of Mr. Maxwell Lyte's is more worthy of attention, in which he shows that the same solution which had previously been working in a satisfactory manner, failed to remove the silver salt as the weather changed and the thermometer fell several degrees.

Leaving the subject of fixing baths, I pass on to notice a communication from Mr. Forster, on the use of gum-arabic as a preservative agent, which communication I hope he will follow up in due time with a second, giving his experience with the same substance during the present summer. One question I will ask:—Why does Mr. Forster wash his plates with a *limited* quantity of water? If he were to get rid of the whole of the nitrate of silver by washing first abundantly with water, and then with salt and water, and lastly with water again, he would find his plates quite as sensitive as Fothergill plates, according to my experience—that is to say, if in addition, the thick solution of gum were left to dry upon the surface of the film. I know the appearance of the brain markings of which he speaks very well, but have not met with them now for more than fifteen months; and I think I can promise Mr. Forster that, if he will prepare pyroxyline by the formula with weak acids, given in my paper in the last Journal—wash away the whole of the nitrate of silver—and develop the plates by pouring the solution backwards and forwards from a measure, he will no longer be troubled with this annoyance. Citric acid in the developer, however, appears too powerful a retarding agent for gum plates used without free nitrate of silver; it diminishes their sensitiveness and produces metallic images.* Glacial acetic acid, fifteen to twenty minims to the ounce, gives a picture with more of a red tone, and does not interfere with the bringing out of the dark parts. On an albumen plate I have not found the citric acid to affect the colour of the image, and I can understand that it might not do so to the same extent when gum and nitrate of silver were left together upon the film. In the case of gum without nitrate, the tendency to form an image of a red, brown, or amber yellow colour is not so decided, and therefore it is of more importance to balance the amount of acid correctly.

P. S.—Since writing the above, I have taken the trouble to pick out the little crystal before alluded to, and examine it. It is transparent and permanent in the air, very dense and highly refracting, hard and gritty when crushed with a glass rod, has a sweet taste, and is soluble with difficulty both in cold and hot water. The aqueous solution throws down a thick white deposit with nitrate of silver, which almost immediately becomes yellow and then black. After the addition of nitric acid, chloride of sodium precipitates chloride of silver from the aqueous solution. These tests prove the crystal to have been a double hyposulphite of soda and silver, and, from its sparing solubility, probably the second of Herschell's compounds, viz., that represented by the formula—$A_g\,O,\ S_2\,O_2\ +\ Na\ O,\ S_2\,S_2.$ Lenz describes this body as a dirty white powder, and I am not aware that it has hitherto been obtained in crystals so well defined.

P. S. No. 2.—At the expiration of a week from the time of making the experiment both solutions of hyposulphite remain clear and colourless, but the bottom of the bottle containing the larger quantity of hyposulphite of silver is covered with sparkling crystals.

* This observation applies to pictures taken in a bad light, and with collodion newly iodised. In a bright light, and with older collodion, I should expect to obtain sufficient intensity even with citric acid, which always possesses the merit of preventing fogging from irregular reduction of silver.

ON PRINTING PHOTOGRAPHIC PICTURES FROM SEVERAL NEGATIVES.

By Henry P. Robinson.

[Read at a Meeting of the Photographic Society of Scotland, March 13th, 1860.]

Rather more than two thousand years ago Zeuxis, of Heraclea, painted his famous picture of Helena for the people of Crotona, in the composition of which he selected, from five of the most beautiful girls the town could produce, whatever he observed nature had formed most perfect in each, and united them all in one single figure. A reference to the dim traditions of antiquity might perhaps be considered out of date in treating of an art which was discovered only a few years since; but the purpose of the paper I am about to read this evening is to induce you to do in photography something similar to that which the old Greek did in painting, that is, to take the best and most beautiful parts you can obtain suitable for your picture, and join them together into one perfect whole.

I have frequently been requested to give some information on the method I employ in producing photographic prints from two or more negatives: the plan is so simple that I have never before thought it worthy of a written description; however, I have now prepared a few prints, the inspection of which will enable you to understand how these pictures are produced.

It has often been remarked that an artist who would attempt this kind of work must have very great advantages over other photographers—that he must have time to hunt after the scenes of his pictures, since it is a matter of chance in finding bits of landscape scenery to suit his figures; also, that few people would take the trouble to carry their models and accessories into the country for the sake of one or two pictures, and the possibility of securing none, as models are sometimes refractory and difficult to arrange. But the truth is, that a great variety of appropriate scenes for figure subjects might be formed on a small piece of ground: the principal parts of most of my photographs containing figures and landscapes combined, were taken in a small back yard, about fifty feet long by twenty feet wide. In this I have thrown up a bank, and partly covered it with wild flowers and ferns; the other part consists of an imitation of a mountain spring, covered with honeysuckle, brambles, &c. With this arrangement I can get a foreground for almost any variety of landscape: a heath scene, or the top of a mountain, as in *Nearing Home;* or the side of a river, as in *Here they come!* and *Preparing to cross the Brook;* or part of a wheat-field, as in *Lavinia.* At the foot of the bank is a hole, caused by the removal of the earth to make the bank; into this runs the waste water from a print-washing apparatus which forms a river. In this confined space, with the assistance of a spade and a little ingenuity, a great variety of effects might be produced.

Perhaps the best method of describing double printing will be to take a very simple subject first—although it cannot strictly be called a double print, as only one negative was used. In the picture I have named, *Here they come!* and for which your society has honoured me with the silver medal, the two figures were placed in position on the bank I have described, and a negative taken of them. At the top of the bank was a brick wall: this was objectionable, and had to be removed from the picture; to do which a print was taken of the plate, but neither toned nor fixed, the figures and bank carefully cut out, and the remaining portion of the paper neatly pasted on the negative. Another print was then taken, in which the sky appeared too white; therefore the print was laid on a board, the figures and bank covered exactly with the impression from which the sky had been cut, a clean glass placed over the whole, and the board was carried into the light and the sky graduated down. This proceeding is very simple, and I have no doubt is known to you all, but it will better enable me to describe that which is to follow.

The next step is to add a landscape to a figure, of which *Lavinia* and *Nearing Home* are examples. The same bank has been employed for the figures in these pictures as in *Here They Come!* but instead of a graduated sky a landscape has been introduced: this is accomplished by taking a landscape negative to suit the subject (which should not be of too important a view so as to overpower the figures, but should rather serve to throw them out in relief), and, cutting out so much of the figure and foreground as will come before the distant view, paste it on the landscape negative: when the negative is printed, it will leave the place for the figures and foreground, plain paper: if the figure negative is now covered over so as to print only in the places which are left for it, the picture will be complete.

At first sight it will appear difficult to place the partly printed pictures in the proper place on the corresponding negative. There are many ways of doing this, and either of which might be chosen to suit the subject: sometimes a needle might be run through some part of the print—for instance, in the angles formed by the joining of the bank to the figure,—and the point being allowed to rest on the corresponding part of the second negative, the print will then fall in its place at that point: some other point has then to be found at a distance from the first; this might be done by turning up the paper to any known mark on the negative, and allowing it to fall on it: if two points separate from each other are on the right place, all the others must be correct. The printing-frame can then be closed, and placed in the light to print. This operation is easily performed after a little practice; in fact, all my composition pictures are printed by boys.

Another way of joining the negatives is by placing a candle or lamp under the glass of the printing-frame, and throwing a light through the negative and prepared paper; the joining can then be seen and easily adjusted.

These methods can be applied to any number of negatives forming one picture. I exhibit a print of *Fading Away,* which was printed from five negatives; the joinings are purposely widened to

show how they are combined; you will observe that the composition was so arranged that the divisions occupy unimportant places, easily hidden. This was the first picture I ever composed in photography: of course there are many faults in it, which would not appear so conspicuously if I attempted the subject again. I am sorry to say that the negatives, after giving about two hundred impressions, were injured by damp, through the carelessness of an assistant.

It is sometimes necessary to print a single figure from two negatives: *Ophelia* is an example of this kind. The head was taken from one model, and the figure from another; the print exhibited will show how this is managed: you will here notice that the edges of the two negatives are shaded off, and allowed to fall over each other.

The mechanical difficulties in this kind of work are nothing—amateurs of small experience might conquer them with a little practice: the great difficulty is the choice of a subject, the selection of models, and the drilling of them into their work. The principal figure in *Fading Away* had three years' practice in expression for photography before a satisfactory picture was taken.

It is rather singular that so little has been done in this branch of photography. The method has been practised for many years by the gentleman who first brought it into successful practice, Mr. Rejlander. His pictures have been prominently before the public for some years; but I do not know of anyone, except myself, who has attempted to imitate him. It cannot be that we have no artists among us; we cannot all be so devoted to science that we discard art; our exhibitions give good evidence that there are men practising our profession who can group figures together. It is possible that prints from several negatives combined do not pay so well commercially as proofs from a single glass; but that should not prevent enthusiastic followers of such a pleasing art from pushing it to its greatest extent; and its application to the highest art purposes is certain. But art is thoughtful work for earnest men, and until a photographer devotes his time entirely to a few good pictures each year, we shall never know what artistic effects can be produced. There are other causes which tend to stay the progress of art in photography. Some critics, even in journals which we might expect to encourage any efforts to advance art, have endeavoured to put down the attempts (failures they might be, but they are well meant) of the few who try to get out of the beaten track—the old *Portrait of a Gentleman*, or *Landscape* "*without*" *Figures*, so continually recurring in our exhibitions; they are not content with the condemnation of individual efforts, which would be only fair criticism, but their disapprobation extends to the whole system; one even goes so far as to express not only his *indifference*, but his *dislike* to all attempts to make figure-pieces. It is not the fault of photography that the man has not yet appeared who will make the best use of the abundant materials provided for him.

It has been said that the possession of a good model is a lucky accident; but that is far from being the case. Art can be extracted out of almost anything. A Hunt, inspired by a Ruskin, can make a picture from an oyster-shell. Take any model, find a suitable subject for it, (and here is an occasion to exhibit the *art* that has been denied to phography; for a subject must be imagined, and imagination is art,) and instruct it well in its position and expression. Do not be discouraged by one failure or a dozen; fix in your mind the idea you mean to express, and persevere until it is represented. It will be found that the less models know of photography the better. Actors are always bad models; they know so much, and allow the operator to know so little, that the result is not an artistic picture, but a theatrical study. I am not before you to-night to preach the crusade of art in photography; I have long expected abler men to do that. Every meeting produces speakers on lenses, and cameras, and processes, but very little is said about the application of these necessary instruments and discoveries. I think we are now as perfect as possible in manipulation, as far as black and white are concerned. We want to apply these discoveries to higher purposes than we have hitherto done. The means of producing pictures in our art are as good as those of producing paintings in Raphael's time; and nothing but a deep and earnest study is required to make our pictures rank with the works of the most famous men.

ON GLASS TRANSPARENCIES.

By J. P. M'Adam.

[Read at the last Meeting of the Caledonian Photographic Club.]

The subject I now intend bringing before you has not, I am sorry to say, received from the public its due amount of appreciation; and this, I fear, is chiefly owing to the fact that photographers are not sufficiently alive to their interests, to cultivate this branch of their art with the necessary enterprise. That the public would appreciate such works were they properly brought before their notice is, I think, evident from the fact of the enormous prices sought and obtained for the only class of transparencies that has been published: I allude to glass transparencies for the stereoscope. Who that has looked upon a *chef d'œuvre* of this class by Ferrier but must feel almost sad to leave it, even in favour of a similar subject, on paper, in the finest style. I submit to your inspection two stereoscopic views from the same negative, one on albumenised glass and the other on paper: each is perfect in its own way, but how superior is the glass to the paper! Photographic transparencies have hitherto been chiefly confined to such small objects as shades for lamps, and slides for the phantasmagoria lantern and stereoscope. I, at least, have never seen any work of magnitude executed in this style. When I say this, I ought, perhaps, to except this one which I now submit to your notice, which was executed by myself a few days since. The size in itself is such as entitles it to respect, being not less than thirty-six inches by thirty. The subject is a *View of Leith and the Frith of Forth*, taken from the narrow gap between Salisbury Crags and Arthur's Seat, with the green valley (now, alas! fallen a victim to the burrowing propensities of some of our rifle volunteers) in the foreground. It is magnified from this twelve by ten negative, and seems to have suffered nothing in point of sharpness and delicacy of gradation by the enlarging. The negative was taken intensely sharp, to ensure which the day selected was one on which there was not a breath of wind stirring: the camera and camera-stand were exceedingly strong and rigid, and the lens (a thoroughly corrected meniscus) used with a very small stop; the plate was a "Hill Norris" one.

The camera I use for enlarging is a large deal box, with a travelling partition inside, in which the lens is fixed. In the front end of the box is an arrangement for holding the negative to be enlarged, and at the back end (which is constructed so as to expand or contract like an ordinary expanding camera) is placed the sensitive plate. The focussing is effected by a brass wire, with a knob, which projects at the back, by which the partition holding the lens is made to traverse longitudinally.

Everything being ready, the camera is pointed either to the sky or to a white sheet on which the light is received. For operating in the daytime I employ the camera I have now described; but for my illustrations of to-night, I intend making use of a phantasmagoria lantern, which I will illuminate with this case of small Bunsen batteries. For night purposes the electric light pleases me much better than the lime or any other kind of light that I have yet tried; the purity and intensity being such as to allow a small stop being used. The lantern is of the ordinary construction: the object-glasses are achromatic, and the condensers of the double kind, with which all good lanterns are fitted; they are six inches in diameter. The view I intend enlarging is very small, being one originally of a pair for the stereoscope. The plate I have prepared on which to take the magnified image is twelve inches by ten, not so large as I usually do, but large enough to show you the *modus operandi*. It was prepared last night with a dilute solution of honey, and if I time the exposure aright I am quite certain of a good picture.

[Mr. M'Adam proceeded to light the lantern, the brilliancy of the light being such as to call forth bursts of applause, and after inserting the negative, and adjusting the focus on a sheet of white paper, stretched on a frame, he dexterously substituted for it the prepared plate, which was impressed, developed, and fixed, in a wonderfully short space of time; and, after having been washed, dried, and varnished, was handed round the room for inspection. The details and tone were very fine, and the picture (a view of *Edinburgh Castle* from the Greyfriar's Churchyard), was unanimously pronounced to be perfect, even to the rendering of the light fleecy clouds which floated in the sky.]

Mr. M'Adam then resumed his paper.

As a specimen of transparencies for the lantern, I will, before the lantern is removed, exhibit this view of the *Falls of the Clyde*, taken when few tourists are abroad, and when cameras and lenses are on the shelf for a season. The negative was taken early in last January; and I would here remark that, to see the falls of Clyde aright, you must see them when the water, arrested by the intense frost of winter, hangs solidified over the face of the cliffs, sparkling like a thousand diamonds, and refracting the solar beams in the most intense and gorgeous hues.

I hope the day is not far distant when the windows of our churches and other public buildings, instead of being disfigured as

they now are by bareheaded and barefooted saints, with garments of "sky blue and orange yellow," which set at defiance all the laws of good taste by their gaudy patchwork of colours, will be ornamented with transcripts of nature, and, if portraits are to be introduced, with faithful representations of those who by their intellects and virtues have rendered service to the cause of religion, science, or literature.

I intended to have gone rather further into the manipulatory details than I have done, but as there is nothing essentially new in the process by which these pictures are taken, I have deemed it better not to do so, but will with pleasure answer any question proposed to me.

[Mr. Brown: I am quite delighted at Mr. M'Adam's lucid experiments, and would feel obliged by his informing us what developer he uses?

Mr. M'Adam: I use the gallo-citrate of iron, made by mixing together solutions of pyrogallic acid and proto-sulphate of iron, and adding solution of citric acid, till the precipitate be barely dissolved.

Mr. Montaigne: What kind of collodion do you use, and how do you manage to excite such a large plate as this thirty-six-inch one?

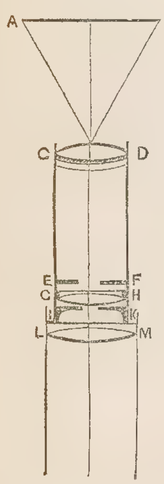
Mr. M'Adam: The collodion is iodised with equal parts of the iodides of potassium, ammonium, and cadmium, with a minute portion of bromide of ammonium. The exciting bath is a large, flat, home-made gutta percha one, with a reservoir at one end sufficient to hold the nitrate of silver, which, when the coated plate is laid in the bottom of the bath, is by means of a slight tilting made to flow over the plate at one sweep.

The meeting then assumed a purely conversational character, and was afterwards adjourned.]

OBSERVATIONS ON A METHOD OF ENLARGING AND MULTIPLYING NEGATIVES.

By William Griffiths.

[Read at a meeting of the Chorlton Photographic Association, 14th March, 1860.]



A B Negative, 3 inches in diameter.
C D Back lens of ¼ plate double combination.
E F Stop, ¾ inch in diameter.
G H Front lens of ¼ plate double combination.
I K Stop, ⅜ inch diameter in contact with lens.
L M Landscape lens, 2¼ inches diameter.

Before proceeding to make a few observations on the method of enlarging and multiplying negatives, brought before your notice at a former meeting, I may be allowed to express my regret and disappointment at not being able to produce for your inspection this evening such specimens of the process as I could have wished.

You will all, no doubt, understand why such is the case when I explain to you that the negatives for enlarging ought to be very faint but full of half tone, semi-transparent even in the high lights, and have little intensity; such negatives, in fact, as result from a slight over-exposure and early checking of the development.

Now I must confess that I do not happen to have in my collection more than two or three that are at all suitable, and they have been almost spoiled in my attempts to bring up the intensity sufficiently for printing from in the ordinary way.

I find also, on looking over the collections of some of my friends, that they, like me, have not been in the habit of keeping by them negatives that are too weak and transparent to print from.

The only ones that are well adapted in all respects (if I may judge from the beautiful transparencies printed from them) are some in the possession of our friend Mr. Wardley, and who, it may be recollected, kindly volunteered to lend me two or three as soon as he could find an opportunity for printing them. Unfortunately from press of business and ill health he has been unable as yet to do so. However, I trust that by another meeting I shall not have occasion longer to trespass on your indulgence.

Before venturing to make any remarks upon the advantages and the convenience of a good and simple method of enlarging negatives, it may perhaps be desirable for the satisfaction of those members who were not present when I first brought this subject before your notice, if I should give a brief description of the method I find to give the best results. And, first, as to the size and quality of the original negative to be enlarged:—I find that the best diameter to enlarge from is one of from two-and-a-half to three inches; for, if you much exceed this, the angular field of your ordinary photographic lenses, which I shall presently recommend you to use as magnifiers, is insufficient to take in the whole of it. I need not tell you that it is essential it should be perfectly sharp and distinct all over, and free from fog and stains. As to its quality, you will have gathered what that should be from my previous remarks. The camera and lens I employ for taking my original negatives, as you will see, is a very diminutive affair, but quite large enough for all practicable purposes. The lens is a double combination one, of a combined focus of about two-and-a-quarter inches from the back lens, giving a sharp picture two-and-a-half inches in diameter.

The varnishing of the negative is not only unnecessary but sometimes detrimental.

The lenses I prefer to use for enlarging are three in number, namely, the quarter plate double combination, together with an ordinary single or landscape lens, of from twelve to fifteen inches focus. The front lens of a half-plate double combination will, if of the requisite focus, answer perfectly well in lieu of a landscape lens. The mode of arranging them, as well as the positions and diameters of the stops made use of, will be much better understood on reference to the rough sketch now before you than by any verbal description I can give.

No extra apparatus of any kind, beyond what most photographers are already possessed of, is required—namely, two cameras, one a quarter-plate with its double combination lenses, and either a half or full plate one, with the single landscape lens. All that you have to do is to screw the two cameras on to a flat board, front to front, taking care that the smaller one is sufficiently packed or raised so that the axial line of its lenses shall correspond exactly with that of the single lens of the larger camera.

I do not make use of any condensing apparatus or reflectors for increasing the amount of light transmitted through the negative; not that I think them useless under some circumstances, particularly when the light is deficient, but because I have been loath to complicate the process by their use, seeing that the advantage gained is only a slightly diminished exposure. The negative to be copied is placed in the dark slide of the quarter-plate camera, collodion side inwards, and securely fastened, so that when the door is opened it may not fall out. Care must be taken, by means of a piece of cardboard of the size of the slide, and with a hole cut out a little less than the negative, to prevent any light passing into the camera, except what passes through the negative.

The board with the cameras is so arranged that the unobstructed light of the sky shall pass through the negative in the smaller camera.

If the direct light of the sun is made use of, it will be necessary to place a piece of finely-ground glass at a little distance before the negative, which will have the effect of more equally illuminating it.

The distance of the negative from the lenses will have to be varied according to the amount of enlargement required, which is easily done by drawing in or out the sliding parts of the camera. I first take a transparent positive, with wet collodion, of the same size as the negative; I then replace this latter in the slide by the positive, and proceed to take my enlarged negatives from it.

I should never attempt an enlargement beyond four or five diameters, and that only from negatives that are tolerably sharp all over. The exposure required will, of course, vary with the light and density of the transparent positive (which must be very faint): from one to six minutes will be about the minimum and maximum for five diameters.

It must be understood that the arrangement of lenses here recommended is only suited to the enlargement of small negatives or positives; therefore if it be desired to enlarge from an original negative, which is, say four or five inches diameter, it will be necessary to replace the quarter-plate double combination by one of half-plate, or, as our worthy treasurer, Mr. Hooper, suggests, place the landscape lens before and in immediate contact with the back lens of the quarter-plate double combination, but with the convex side to the negative to be copied.

I will now, with your permission, say a few words upon the advantages that may be expected from a good and simple method of enlarging.

In the first place, we should be enabled to dispense with large and cumbrous apparatus in our journeyings after the beautiful in nature and art; the personal labour involved in its transit from place to place being, as you will all admit, anything but agreeable, leaving out of the question how materially it detracts from the pleasure we should otherwise enjoy. And in the next place we can, with a

small and short focussed lens, obtain views of subjects that cannot, from their position, be taken at all by one of long focus. And again, as a rule, it will be found that small short focussed lenses take in a much greater angle of view than long ones, besides giving greater depth of focus, and these, added to the diminished exposure required, are advantages which every practical photographer will at once be able to appreciate.

I may also observe how much more free from distortion and true in perspective are pictures obtained in this manner than those taken with long focussed lenses.

I need scarcely remind you with how much greater facility small plates can be prepared than large ones, by any of the dry processes, and of the greater chances of their turning out successful.

In conclusion, I will say a word or two on enlarging processes generally. I am of opinion that they have hitherto proved unsatisfactory, principally from our having experimented with ordinary printing negatives, and also because we have attempted too great an enlargement of what has been, probably, but a very unsuitable negative for the purpose.

If we carefully compare a negative of say three inches diameter, taken with a small lens, with one of twelve inches, taken by a large one, of the same subject, we shall find that the former has a decided advantage over the latter in sharpness and in being a far more truthful representation of the object. Now, I maintain that it is perfectly practicable to enlarge the smaller one to the same size as the larger, and that it shall then be equally sharp with the original large one, and without any of its perspective defects.

I will not say, however, that if you enlarge it to fifteen or twenty inches that it will then be equally sharp with the one of twelve inches taken direct, for that would be quite impossible.

An opinion prevails that it is not practicable to enlarge a picture even to a small extent without considerable loss of half-tone. This is true when applied to negatives originally taken for printing from, as I have previously shown; but it is not so when suitable ones are employed, for in that case whatever is found in the original will be faithfully reproduced.

I am afraid I have occupied more of your time than perhaps some of you may think such a stereotyped subject warranted, particularly as I have advanced nothing that was not previously known to many of you, but I have done so from a strong conviction of its importance to photographic art.

ON THE MEASUREMENT OF THE CHEMICAL ACTION OF THE SOLAR RAYS.*

By Professor H. E. Roscoe.

It would at first sight appear superfluous to comment on the importance of the sun's action in maintaining and supporting the animal and vegetable life existing on the globe, yet it is necessary to consider the subject in order to form a just idea of the magnitude of the sun's action upon the earth. We must not, however, limit our view to the animals and plants restored by solar light and heat: we must remember that each drop of rain, each breath of wind are dependent on the same cause. By the study of geology we see, not only in coal-fields, but in the sedimentary crust deposited upon the surface of our planet, evidences of the enormous power the sun during his epochs has expended upon the earth.

The red rays of the spectrum, which vibrate most slowly, are those which mainly produce changes of temperature: they are, *par excellence*, the *heating* rays. To them is due all those motions in the atmosphere which we term winds, and those enormous phenomena of distillation and deposit we term rains; and the amount and distribution of these heating rays determine what may be called the *thermal* climate of a given place. Those solar rays which, on the other hand, vibrate most rapidly, and are situate at the violet end of the spectrum, are called the *chemical* rays, because it is by them that the chemical action produced by the sun's light is effected. It is by these rays alone that the plant is enabled to decompose the carbonic acid of the air, to assimilate the carbon for its own use, and to set free the oxygen for the subsequent use of animals. Thus the character of the flora of any place depends mainly, or to a great extent, upon the amount and distribution and variation of the chemical rays which fall on that place, and determine what may be called its *chemical* climate.

Now the measurement of the quantity of solar radiation which falls on the earth is a most important matter — a most important material for the determination of the physical history of our globe. We possess a means of measuring the effect of the heating rays or temperature in the thermometer; but up to the present time no such measurement has been adopted for the chemical rays, not so much because meteorologists have ignored the subject as on account of the difficulty which seemed to surround the attainment of an accurate measure.

If it be asked—"What do we mean by chemical action of light?" we answer, by showing its effects in blackening chloride of silver, and decomposing it; changing not only its external appearance, but also its internal physical properties. Again, if we put newly-gathered leaves into a bottle containing carbonic acid, and allow the sun's rays to fall upon them, we find that those leaves possess the power of assimilating the carbon and setting free the oxygen: we see the little bubbles of oxygen rise up through the water, and we can collect them to prove the fact.

There are two gases known as chlorine and hydrogen, which, when mixed in equal proportions, combine and form hydrochloric acid gas: they combine under a great variety of circumstances, but the one which now especially claims our attention is that they combine under the influence of light, whereas, in the dark, they do not combine at all. In diffused light the combination is gradual, but under the influence of the solar rays the combination is effected so suddenly, and the heat evolved is so great, that explosion ensues.

Now for the measurement of this action, produced not only by solar light but by other means, we want some chemical instrument, which, like the thermometer, shall show objectively the amount of chemical action—a photometer, a correct instrument—one in which the indications shall be in exact proportion to the amount of chemical rays emanating from any source, and represent that amount.

An instrument has been contrived which measures the chemical action of light by means of the mixture of chlorine and hydrogen gases, which form hydrochloric acid. It consists of three parts: one in which the hydrochloric acid gas is decomposed by an electric current. The component gases then pass into the second portion of the instrument, where they are exposed to the action of light; and from that into the third portion of the instrument, where the measurement is made. A great many precautions are necessary to be taken before the instrument is in a fit state for use. The gases have to be passed through the instrument for more than a week. To get it into working order, the apparatus is filled with gas, and placed in a dark room, with a small lamp or candle to light the operations. The instrument being fully charged with gas, the source of light, whatever it be, is brought to bear upon the insolation vessel; and the rays being allowed to fall upon the mixture of gases, immediate combination takes place: hydrochloric acid is formed, and a diminution of space ensues.

There is therefore a constant motion along the index tube; and every minute, or every two minutes, we read off the rate at which the water moves along the tube, which, being attached to a scale, enables us to measure the chemical action, because the amount of hydrochloric acid formed is proportional to the amount of light. Thus, the chemical photometer is an instrument by the help of which the quantity of hydrochloric acid thus formed can be accurately measured. It is therefore a reliable instrument.

The instrument requires to be graduated, by taking a certain amount of light, and observing its action. We take the blue flame of carbonic oxide gas, burning at a certain rate, and at a certain distance from the instrument: a definite result is obtained, and we mark that result, whatever it be. It does not signify where the instrument marks the unit of light: whether it be one foot, or ten feet, or ten divisions of the scale. We have a certain amount which can be taken as the unit or standard of light. If this flame be placed, say at a distance of one *metre* from the instrument, we obtain, in the dark room, a certain amount of chemical action, and that amount we take as *one*.

Thus we have a comparative measurement of the chemical action of light. The possession of a constant source of light is the first essential for the measurement of photo-chemical actions:—

1. A flame of pure carbonic oxide, burning in the air and issuing from an opening of a given size, at a given rate, is employed as the standard flame.
2. The unit amount of chemical action is that effected by such a flame upon the sensitive mixture of chlorine and hydrogen during one minute, at a distance of one metre.
3. The quantity of light producing this action is called one chemical unit of light, and ten thousand of such units, one chemical degree of light.
4. The chemical photometer is graduated by observing how many of these chemical units of light correspond to one division on the scale of the instrument.

(To be concluded in our next.)

* Condensed from a Lecture delivered at the Royal Institution, on the 2nd instant.

ON THE REPRODUCTION OF ENGRAVINGS, PRINTS, ORDINARY WRITING OR LETTERPRESS ON PREPARED PAPERS BY CONTACT IN THE DARK.

By C. J. Busk.

[Read at the Blackheath Photographic Society, 19th March, 1860.]

The pictures shown this evening are the result of a process I discovered about twenty years since, by which engravings, prints, letterpress, or writings with common inks, may be copied on prepared paper, by contact with it in the dark. The image, at first invisible, will be developed as a negative, by holding the paper by itself for a short time in bright sunlight: a few seconds suffice in some instances, but a longer exposure is requisite when the sun is not bright.

I am unable to fix with minute accuracy the date of this discovery, but it was in the year 1840. I was then residing at the Cape of Good Hope, and in the course of that year used occasionally to prepare papers with salt and nitrate of silver, according to the formulæ given in some of the periodicals of that time, for the purpose of copying the leaves of plants, &c. This was done over night, and the papers were then placed between the leaves of books to preserve them till the morning.

On one occasion, in order to vary the experiment and try something new, I steeped some paper in a solution of tartaric acid (about a teaspoonful to a tumbler of water) instead of the salt solution, and after being dried it was immersed in a solution of nitrate of silver, sixty grains to the ounce of water: again dried and placed as usual in a book. On exposing it next morning in a bright sunlight, instead of an image of the object placed on it to be copied, I was greatly surprised to see a totally different picture appear as if by magic.

Ultimately on reference to the book in which the paper had been during the night, I found I had a negative copy of the picture it had been in contact with.

Struck by the singularity and unexpected result to this my earliest original experiment in photography, I prepared other papers in a similar manner, and was equally successful with them. I recollect one in particular: on a half sheet of foolscap I obtained a very distinct copy of the *Warwick Vase*, from an engraving in the *Saturday Magazine* (I think it was called), a periodical of that time. The copy was very clear and well defined, and of a tolerably dark reddish slate colour. This picture was shown to many persons, and was in existence for some months; what at last became of it I do not know. It was not fixed otherwise than by simply washing in water, and it did not seem to lose its distinctness during the period I recollect it.

Only practising photography as an occasional amusement in the most simple way, it did not occur to me to take any steps to bring the matter to the knowledge of scientific persons, and in the course of a short time I ceased to make further experiments, but not until I had ascertained that oxalic, citric, and some other acids produced similar effects.

Since I have been in England, during the last ten or twelve years, this experiment has been only occasionally spoken of, and a few repetitions made with tartaric acid to show the effects. Within the last month, however, I have been urged by our President, Mr. Glaisher, and by Mr. Heisch, a member of the society, to bring this discovery to public notice, as it might probably be made available for some useful purpose.

The experiments I have made of late, though still incomplete, show very interesting and satisfactory results. I hope others may feel inclined to investigate the subject also, with a view of eventually bringing it to practical use.

From what I have done, I think it very probable that negatives can be produced that will allow good positives to be printed from them. Until lately I imagined that an organic acid was a requisite ingredient to use in preparing the papers, for my earliest trials with inorganic acids were not successful; but more careful experiments of late show that, so far as I have used them, they will answer equally well. Also I have found that paper dipped in a solution of nitrate of silver alone, after a few hours' contact with an engraving or print, will give a faint image in bright sunlight (probably in consequence of a little free acid in the nitrate of silver solution), and even if the image should not appear after a few minutes' exposure, it can be developed by pyrogallic acid, one grain to the ounce of water, with a few drops of nitrate of silver solution added; but the effect thus produced is different to that when it is developed by sunlight alone. The image which comes out appears of a different shade of colour to the rest of the paper and changes to a white metallic lustre, whilst the ground turns to a dense black.

In order to produce good effects with distinct whites, it is requisite, and is the main feature of my process, to steep the paper in an acid solution. Different acids give slight differences in the clearness of the whites. Glacial acetic acid I have found to produce the very best whites, and it also ensures uniformity of colour in the dark parts.

The twenty-six pictures, measuring six inches by eight, now before you, are the best I have been able to make within the last few days. The weather has not been very favourable for developing the image. Each picture has attached to it the formula according to which the paper was prepared. They were nine hours in contact with the engravings, letterpress, and writings to be copied —not, be it understood, that such a length of time of contact is requisite, but simply because it was most convenient to prepare the papers over night, and to let them remain on the engravings till morning. Half an hour or an hour of contact is enough, and probably much less time will do. I have got a picture after five minutes' contact, and which after contact, but before exposure to sunlight, was placed between sheets of blank white paper for a day and a half. It then came out as perfectly as those longer in contact, and exposed immediately after removal from the original.

Two of the specimens on the table, marked S. P. 111 and 112, were nine hours in contact, and then twenty hours between blank papers: no difference in distinctness of image or clearness of whites can be distinguished between them and the others. They and many of the other pictures have been taken from the engravings in the *Art Journal*, representing the articles shown at the Great Exhibition of 1851. One is from a coloured example of Minton tiles, in the September number of that year, and shows the different effects of different colours — blues producing yellows, and reds and yellows giving whites, more or less clear; others are from engravings and letterpress in different books; some are taken from manuscript writings of the year 1845, and one from a machine-pressed copy of a letter, written 6th June, 1848, as you will perceive on inspection.

It is not at all necessary to expose the engravings or writings, or other designs, to sun or daylight before placing the prepared papers in contact with them. A design that has not seen light for years can be taken equally well, and in as short a time. Some of the specimens shown are on Turner's negative paper — some on Saxe paper, both positive and negative. Some of the papers have a distinct picture on each side—some on one side only—intended for use as negatives to print from. The white back to the paper has been obtained by placing a piece of black transfer paper in contact with it. A long exposure to the sunlight has not the least deteriorating influence on this whiteness, when glacial acetic acid has been used in the nitrate of silver solution, and applied on both sides of the paper.

This change, produced in the prepared papers by their having merely been in contact with black and some other colours, and which prevents discolouration on exposure to sunlight, is exceedingly curious. Perhaps some one more experienced than myself in photographic chemistry may be able to explain the nature of the chemical action that produces this singular result.

The papers have nearly all been wetted on both sides with the two solutions used in preparing them. The proportions of the ingredients have been varied for experimental purposes; — the acidifying or first solution in which the paper is steeped has been, for some, eighty grains tartaric acid by itself in an ounce of water; for some, eighty grains tartaric acid, with one drachm glacial acetic acid added; for some, twenty grains tartaric acid, with half a drachm glacial acetic acid; and for some, fifty grains tartaric acid alone; and for others, one ounce glacial acetic acid in two ounces water, without tartaric acid.

For the sensitising, or nitrate of silver solution, I have used for some time fifty grains of nitrate of silver for some; for some, sixty grains; for some, ninety grains to the ounce of water. The nitrate has been used by itself, and also in combination with glacial acetic acid, half a drachm to one drachm to the above proportion in an ounce of water.

These various proportions give slightly different shades of colour to the negatives, and the shade of colour is also affected in some degree by the nature of the size in the paper, those sized with gelatine being rather redder than those sized with starch.

Of the various mixtures I have used, I am inclined to think the following proportions will give the best results, and should be applied to both sides of the paper:—For the first, or acid bath, eighty grains of tartaric acid by itself to an ounce of water; the paper to be immersed for a short time and then dried by a moderate heat; then immersed or well wetted in a solution of nitrate of silver of

fifty grains, or not more than sixty grains at most to the ounce of water, with about half or one drachm of glacial acetic acid added. Equally good results are obtained by twenty grains of tartaric acid and half a drachm of glacial acetic acid, for the acidifying solution; and also by one ounce of glacial acetic acid mixed with two or three ounces of water, and the above mentioned nitrate of silver solution. Nitric acid, about one drachm to the ounce of water, has also given good pictures.

The sharpness of definition and the whites in these negative pictures being so good, the only desirable point still to attain is to give greater intensity to the dark parts. With this object in view I am still experimenting, and with good hope of succeeding shortly. It will then give me pleasure to communicate the results, with particulars, to this society.

Before I conclude I may observe that, within a recent period, I have seen mention made in the *Year Book of Facts* for 1858, pages 208 and 209, of some experiments by the celebrated photographer, M. Niépce, of Paris, of a somewhat similar nature to mine. He used ordinary sensitive paper, and only succeeded in obtaining a faint image after placing it in contact with an engraving or other design, which it was indispensable should itself have been previously exposed to strong light for a considerable time.

The discovery of my process was eighteen years prior to this, and by it the exposing of the pictures or designs to be copied (to the light in the first instance) is not at all necessary, however long they may previously have been in the dark; and the image produced is almost all that can be desired in a negative. I do not think that by using ordinary sensitive paper, good negatives with clear whites can be produced, but consider the employment of acids in the preparation of the papers to be indispensable in order to obtain them.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The annual meeting was held at Myddleton Hall, Islington, on the 28th ult.,—George Shadbolt, V.P., in the chair.

The minutes of the last meeting having been confirmed,

The "Report of the Committee" was submitted as follows:—

THIRD ANNUAL REPORT.

The time has again arrived that your Committee should address you, and it congratulates you on the prosperous state of the association.

The meetings have been well attended, and papers read of no ordinary character and merit. Much that is novel in photography has been fully discussed; and the mutual desire of the members to assist each other in overcoming the many difficulties of the art has caused the evenings of meeting to be anticipated with no little pleasure.

Owing to the universal readiness on the part of the members to accede to the wishes of the Committee, and their generous exertions in providing material for the meetings, the labours of the Committee have been few and light.

As finance is a subject of importance, your Committee deems it a duty to inform you that the expenditure for the past year exceeded the income by a few shillings; and as this has been caused by the non-payment of the subscription of two members, the Committee has passed the following resolutions, with the hope of avoiding loss, and increasing the advantages of those members who may be induced to join the association late in the session:—

"That the subscription of ten shillings and sixpence per annum being due on the 31st of March, and payable in advance, should be paid to the secretary before the 28th of April next ensuing, and that the delivery of the Journal be discontinued to those members whose subscriptions are in arrear on that day; but on the payment of the same any time during the current year, the back numbers of the Journal shall be forwarded.

"That a member elected any time during the year be entitled to the numbers of the Journal from the 1st of April inclusive."

The balance in the hands of the treasurer, after payment of all liabilities of the association to the present time, is £8, 17s. 11d.

The following is a list of the papers read at the meetings held during the past session:—

March 30. By W. Hislop, Esq., F.R.A.S.—*A description and exhibition of a Lantern for illustrating lectures, &c., by means of transparent positives on glass; for the enlargement of microscopic objects, and for other purposes.*

April 27. By D. W. Hill, Esq.—*A Modification of Maxwell Lyte's Meta-gelatine Process.*

May 25. By W. Hislop, Esq., F.R.A.S.—*Remarks on the Preparation of Dry Plates.*

Sept. 28. By Dr. R. L. Maddox.—*The Parafine Paper Process.*

Oct. 26. Dr. Ryley gave *The Result of some Further Experiments on a Modification of the Collodio-Albumen Process*, which gave rise to a discussion on the merits of the dry processes generally.

Nov. 30. By G. Wharton Simpson, Esq.—*On the Positive Collodion Process, with some Remarks on the Alabastrine Process.*

Dec. 28. By A. J. Melhuish, Esq.—*On the Metal Camera.*

Jan. 25. By C. J. Hughes, Esq.—*On Toning with Alkaline Chloride of Gold.*

Feb. 29. *Discussion on a Letter by C. Oakeshot, Esq., of Ryde. Subject, Gold Toning.*

The Committee is of opinion that each member might enhance the prosperity of the association, by making its advantages more generally known; and with increased numbers benefits would accrue to all.

Your Committee would not let this opportunity pass without recording its sense of obligation to those gentlemen who have kindly read papers, exhibited apparatus, and taken part in the discussions at the meetings; and also to Mr. F. Bedford, for the liberal terms on which he supplied the Presentation Photograph.

Your Committee again assures you that it will avail itself of every opportunity of increasing the advantages of the members, and rendering the association worthy of the rank it has attained in the photographic world.

THE TREASURER IN ACCOUNT WITH THE NORTH LONDON PHOTOGRAPHIC ASSOCIATION, 28TH MARCH, 1860.

Dr.	£ s. d.	Cr.	£ s. d.
To Balance, 30th March, 1859	9 4 10	By Rent	4 10 0
Subscriptions (72 Members)	37 16 0	Presentation Photograph	8 0 0
		Journal	21 11 8
		Printing, Stationery, &c.	4 1 3
		Balance	8 17 11
	£47 0 10		£47 0 10

Audited and found correct, W. MORLEY. D. W. HILL, *Treasurer.*

Moved by Mr. Goslett, seconded by Mr. Dawson, that the report and statement of accounts now read be received and adopted.

The officers and existing members of committee then retired from office, in accordance with the rules of the society, and the following were elected to serve during the ensuing year, viz.:—

President.—Charles Woodward, Esq., F.R.S., J.P.
Vice-President.—G. Shadbolt, Esq.
Treasurer.—D. W. Hill, Esq.

Committee.

Mr. T. A. Barber,	Mr. W. J. C. Moens,
„ A. Goslett,	„ W. Shave,
„ C. J. Hughes,	„ G. W. Simpson.

Hon. Secretary.—Mr. John Barnett, 9, St. Peter's Terrace, Islington, N.

Some very well manufactured glass dishes, baths, and dippers were exhibited by Mr. Goslett. These were of a *hard* kind of glass, and extremely convenient in form, and were stated to have the additional recommendation of being cheap.

Mr. Hannaford exhibited a portable camera for plates eleven inches by nine, and having an arrangement for producing the effect of a swing-back by adjustment of the front in one direction, and the back at right angles thereto; also a compact folding stereoscopic camera, with movement for instantaneous exposure, by Mr. Clark, of Kennington, and Messrs. Squire's pocket camera, for stereoscopic pictures.

Mr. Goslett exhibited a series of specimens of glass adapted for photographic purposes, viz.:—Flatted crown, patent plate, patent plate roughed, colourless patent plate, opal, opal roughed on one side, yellow, orange, ruby, black, light blue, and sky blue; also a piece of photographic paper exposed under various coloured glasses, showing the effects of retardation of the actinic rays.

A desultory discussion then ensued on the application of the various kinds of glass, and the changes they undergo by exposure to light, in which Messrs. Goslett, Quin, Hughes, Wall, Hannaford, and others took part.

Mr. G. Wharton Simpson asserted that a lens that he had in use for some years had become decidedly slower in action, possibly in consequence of the changes in colour of the glass of the lens arising from exposure to light.

Mr. Hughes and Mr. Quin both objected to the use of *smoothed* glass, (as it is termed), as being almost impossible to clean properly.

Mr. Goslett stated that, by using the finest washed emery between two pieces of *smoothed* glass, rubbing them together, and copiously washing with water, the *smoothed* glass can be readily and perfectly cleaned.

Mr. Hannaford then made some remarks upon the subject of "burning in" photographs upon glass.

Mr. Goslett related an instance in which some common German glass had been used for glazing a picture-frame in which an engraving was preserved, and that an image of the engraving was subsequently found to be impressed upon the glass.

Mr. Wall, in taking a coloured photograph from a passe-partout, found that, on breathing on the glass, a faint image of the picture was left behind.

Mr. Goslett inferred, that both these examples demonstrated the inferior quality of the glass employed, which probably contained an excess of alkali in its composition.

Mr. Dawson referred to that part of Mr. Oakeshot's letter, published in our last number, relative to the experiment of MM. Davanne and Girard, on fixing positive proofs. He stated that, being by no means satisfied of the

correctness of the observations made by these gentlemen, he had gone through a series of experiments as follows:—

Having dissolved ninety-six grains of hyposulphite of soda in half an ounce of water, and precipitated chloride of silver, by means of common salt, from the nitrate of that metal which he washed and dried, he dissolved five grains of the latter in the half-ounce of solution of hyposulphite before mentioned, the solution being perfectly effected in the space of *two minutes.* Having waited for about ten minutes, he dissolved in the same solution four more successive quantities, of five grains each, of the chloride of silver, which took as follows to dissolve, viz.—

2nd ....Five grains in 2 minutes.
3rd .... " " " 2 "
4th .... " " " 2 minutes and 10 seconds.
5th .... " " " 2 " " 15 "

The whole was then left in repose for twenty-four hours, without any deposit being formed. He then added *four more* successive quantities of chloride of silver, each of five grains, when the

6th......Five grains dissolved in 2 minutes 30 seconds.
7th...... " " " 3 "
8th...... " " " 4 " 30 "
9th...... " " only about half of it could be made to dissolve, but the hyposulphite of soda had then taken up *nearly half its own weight* of the chloride of silver.

On stirring with a glass rod, a white precipitate was thrown down, which, on removal from the liquid, was found not sensitive to light.

The solution was then evaporated in a porcelain capsule over a sand bath, maintained at about 180° Fahrenheit, when it changed to a dark colour, and precipitated a brown powder.

During all the experiments, a piece of litmus paper (one half reddened) was kept in the solution; but neither acidity nor alkalinity were manifested, excepting during the evaporation, when decided acidity was displayed. Mr. Dawson concluded by expressing his conviction that Messrs. Davanne and Girard were decidedly wrong in their statements.

Mr. Dawson stated that, in consequence of some remarks upon ammonia fixing, by the Vice-President, at a previous meeting, he had tried some experiments with it, and found that, as asserted, albumen, after the action of the nitrate of silver, was not soluble in the ammonia. He exhibited a number of proofs perfectly fixed by both methods, and could detect no difference between them. He had tried a rough experiment relative to the solvent power of the common liquor ammoniæ for chloride of silver, in a similar way to that employed for the hyposulphite of soda, and found that, in half an ounce by measure of the liquor ammonia, the

1st ....Five grains dissolved in 2 minutes.
2nd .... " " " $2\frac{1}{4}$ "
3rd..................... " " " $3\frac{1}{2}$ "

And that this last addition exactly saturated the liquid.

Votes of thanks were then passed to Mr. Goslett, Mr. Hannaford, and Mr. Dawson, and after a protracted but highly interesting sitting, the meeting was adjourned till the 25th instant.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the above society was held on Thursday, the 15th ult.,—the Rev. F. F. Statham, F.G.S., President, in the chair.

The minutes of the last meeting having been read and confirmed,

The Secretary said he had to thank Mr. J. A. Forrest, of Liverpool, for calling his attention to the contemplated Exhibition of Photographs, in connection with the Liverpool Society of Fine Arts. This was, he believed, the first exhibition of paintings at which specimens of photography had been admitted, and he should be glad to see the art which produced them so represented at this exhibition as to prove it worthy a place beside its sister art—painting.

A report from the committee was then read relative to the organisation of a Photographic Exchange Club, expressing a desire to place the arrangements upon a good working foundation. It had been suggested that the members of the club should not necessarily be members of the society, but that all who were willing to pay a nominal yearly fee to cover the expenses of postage and stationery should be admitted, and that a competent secretary be appointed, through whom only exchanges between members and non-members should be effected, in order that no specimens might be exchanged but such as were of comparatively equal value. Those joining this club would be required to place specimens of their ability in the folio, with their name, address, and the words "for exchange" attached.

Some conversation upon this subject then ensued, in the course of which it was suggested by Mr. Hannaford that it would be advisable to rule that each party merely pay the cost of transit, instead of establishing a definite yearly payment; and by Mr. Wall that all our societies might combine for the purposes of exchange, and by so doing establish a connecting link between each and every organised body representative of the photographic community throughout the three kingdoms. He thought that a social feeling of kindly intercourse never failed to benefit all concerned. Eventually, at the suggestion of the Chairman,

Mr. Stevens moved, and Mr. Fitch seconded, that a vote of thanks be tendered to the committee for their report, and that they be requested to carry out the proposed arrangements.

This motion was carried *nem con.*

Mr. M. Hannaford then read the following short and very interesting paper, illustrating it practically as he did so, and exhibiting specimens. This was given as a continuation of the

PHOTOGRAPHIC JOTTINGS.
No. 4.
On Iron Printing.

After some few remarks, and one or two introductory experiments, Mr. Hannaford said:—The process I am about to describe was made public by me last year, at a meeting of the North London Photographic Association, and I have but little further that is new to add now, excepting some details of manipulation. I will, however, very briefly recapitulate.

Float French paper on the following sensitising solution, and hang by one corner to dry in the usual manner:—

Albumen.........................	1 part	1 ounce.
Water	1 "	
Ammonio-citrate of iron....about	50 grains	
Bichromate of potassa ....to saturation		

The time of exposure will be rather longer than for silver prints, but not materially so. The picture should appear of a brown ochre colour, on a yellow ochre ground, showing details and half-tones as fully as an ordinary silver print.

Well wash to remove the iron from parts not acted on by the light, and darken by saturated solution of gallic acid.

This is the process in its simplest form; and I will now add a few instructions for obtaining a variety of tones, and also some hints that may be of use in manipulating.

Gold Tones.—Expose and wash as before. Then immerse the print for two or three minutes in chloride of gold half grain, water one ounce. Wash thoroughly and darken by gallic acid. By immersion in a very weak solution of iodide of potassium a variety of pinkish tones may be obtained. The colours of these prints are by no means so brilliant as those of the gold-toned silver ones, but they are quite equal to the tones got by the old sulphur bath without gold.

Blues, Greens, &c.—For Prussian blue prints proceed as in the last case, but using solution of ferro-cyanide of potassium instead of gold. On development by gallic acid the picture will appear of a blue-green, which may be converted into a bright Prussian blue by weak solution of hydrochloric acid, a few drops to the ounce of water.

Red prussiate of potash used instead of the yellow prussiate, gives a good blue black, which hydrochloric acid converts into a dull blue.

A solution of borax poured over a Prussian blue print very materially deepens the colour. Gum arabic, mixed with the sensitising solution, tends to give a ferro-cyanide picture a decidedly green tint; but when simply developed by gallic acid, the resulting positive is of a dark bistre tone, not in anyway partaking of "inkiness." Gum arabic, however, is by no means a good size to employ, as the picture is very apt to wash off from some portions. If gelatine be employed, no amount of washing seems to remove the unsolarised iron thoroughly, even though hot water be used. Foreign starch-sized papers are, therefore, far better than the English, which contain gelatine. When, however, albumen is used as I recommend, the prints will bear any amount of rough washing, and for any length of time.

The greatest difficulty to overcome is the slight—very slight—discolouration of the whites, to about the same extent as in developed silver prints. The plan I adopt is to immerse the picture in a weak solution of carbonate of soda, ammonia, or acetic acid. The alkali produces a not over agreeable red tone, while the acid does not materially change the tint.

The President thought very highly of this interesting and exceedingly economic process, and inquired whether Mr. Hannaford had used any of the alloys of iron? A variety of tints might also be obtained by the use of gaseous vapours, and he recommended Mr. Hannaford to pursue his experiments in this direction; since, although the results at present obtained might not compare with the better understood silver process, there was evidently much of promise and encouragement to be found in the specimens before them. After some other remarks,

Mr. Hannaford said he had not tried alloys, but he thought it possible to obtain many of the other colours named by the President, viz., the ruby-red, by mercury—the silver-grey, by gold, &c. He intended to pursue his experiments in printing with copper, and also hoped to lay before the society some further experiments in the iron process. In conclusion, he paid a well-merited compliment to Mr. Hunt, whose experiments, he said, originated nearly all these new processes.

Mr. F. Howard said he had not the knowledge of chemistry which would enable him to aid the present discussion, but it had struck him that a process so very inexpensive, and producing such a variety of beautiful colours, was calculated to afford some assistance to manufacturers requiring patterns.

Mr. Hannaford believed that the process had its foundation in that of calico printing.

Mr. Wall would ask Mr. Hannaford if there was any reason why these iron pictures could not be produced upon ivory. A series of experiments, which were tried at his establishment some time back, led him to suppose that the few pictures upon ivory which might be called suc-

cessful were certainly not produced by the usual silver process. [Mr. Ackland here whispered to the Secretary that they certainly were.] Seeing that ivory was a composition of gelatine and phosphate of lime, the difficulties to be encountered were apparent at once; but he was led to make the inquiry by remembering that all who had produced good pictures upon this surface had practised and experimented in the iron printing, and that some of the colours in the specimens before them closely resembled those he had seen upon ivory.

Mr. Hannaford thought he should find little difficulty in obtaining iron prints upon ivory, and had no doubt of being able to produce a good specimen on this material at their next meeting.

Mr. Statham inquired if the colour of the iron prints changed at all when removed from the bath?

Mr. Hannaford said they did not.

Mr. Wall, in reply to an inquiry, said the colours produced by iron printing closely resembled those in which most of our best painters first laid in their subjects, and were therefore especially adapted for the purposes of colouring, with the additional advantage of undoubted permanence.

A vote of thanks having been awarded to Mr. Hannaford by acclamation, the President called upon the Secretary for his promised "jotting."

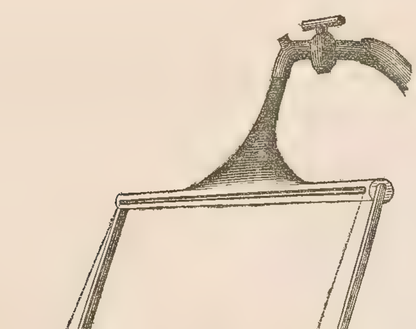
Mr. Wall then read the following short paper:—

PHOTOGRAPHIC JOTTINGS.
No. 5.

On Photographic Print Washing.

A lengthened immersion in water is now very generally admitted to be injurious to the more delicate tones of the photograph, and yet we readily acknowledge the vital importance of removing every trace of hypo from the paper. I do not think the time of washing can be very materially shortened by the ordinary process without great danger, and as a proof of this I may venture to describe an experiment recently tried by Mr. G. W. Simpson. Professor Taylor having provided him with a very delicate test for the hyposulphite, he used it in the last water in which a print, previously washed by the ordinary means for twenty hours, had been placed, which print, I should say, had also been subjected to the action of boiling water; upon doing so, a brown sulphureous precipitate was immediately formed, proving the existence of the destructive agent in a very decided manner, even after this lengthy treatment with repeated changes of water. A constant and thorough changing of the water, and the continual movement of the prints, had been secured by several mechanical contrivances, but even thus aided the prints were found to have been too long in the water. The speed and certainty of the washing process being therefore a matter of importance, every hint becomes of some value, and he should not hesitate to occupy a few minutes in describing a machine by which the prints were subjected to a variety of cleansing actions by water, viz., by the water running *over* the surface of the paper, penetrating *through* the paper, and acting upon *the back and front* of the paper at the same instant of time.

MR. WALL'S PRINT-WASHING APPARATUS.



Procure, in the first place, a length of piping, regulating its diameter and length according to your supply of water or the work it has to do; make a narrow opening along its entire length, one end of which is turned over to form a kind of lip. The holes at either end must be securely fastened up. To the centre of this piping, and exactly opposite the long aperture, attach another smaller pipe of about two or three feet in length, opening into the first pipe through a long mouth gradually widening to the entrance into the larger pipe, the other end of which is so contrived that it will screw, with a nut, to a water tap for the admission of water.

The next article required is a long cylinder or drum of some stout but porous material, such as rather close webbing, stretched upon a very light cane frame made to revolve upon two pieces placed at either end. This is then attached to the pipe with the long aperture at a distance of about three feet, and the tap being turned on above, a sheet of water falls from the opening upon the drum below, causing it to revolve.

A number of prints being fastened upon the drum are, as I have said, washed above and below, in front and behind at the same time, the water passing completely through the cylinder and prints. The rotatory motion can be quickened to a great extent by attaching a small light water-wheel to one end of the drum, and the waste water may also be preserved by falling into a tank or sink below.

There was not, as some might suppose, the slightest danger of injuring the fabric of the paper by this method; for to test this he had subjected a piece of blotting paper to the action of the falling water, descending from a greater height than that mentioned, for many hours without injury.

The President said that, like a great many other things, this process, though simple in character, was yet of the utmost importance. The adoption of a water-wheel seemed to be useful; but he thought Barker's arrangement would be a better one (by which a small stream of water did the work of a very much larger quantity).

Mr. Hannaford thought Mr. Wall's process of washing a very good one. The hyposulphite, although in itself a very soluble salt, was removed from paper with very great difficulty, and he did not know any better illustration of this than that afforded in practising the iron process.

Mr. Howard thought the hypo could be removed without the prolonged washing so frequently recommended if the prints were carefully treated. Much less washing was necessary when using the alkaline bath. The hypo should be fresh each time.

Mr. Herve had some prints which had remained unchanged a very long time, and he attributed the fact to the use of a brush in the washing process. He thought the real permanence of photographs would never be secured by any process but a chemical one; but he was going to make some experiments in this direction, and would on some future occasion acquaint the society with the results.

The President suggested a chemical solution for the removal of the hyposulphite. The dispersed atoms retained in the paper would adhere too closely to be removed by any gentle action of washing; and Mr. Hervé might justly, perhaps, attribute the comparative permanency of his productions to the use of the brush. In that case the mechanical abrasion obtained by Mr. Wall's method would undoubtedly prove effective, acting as it did upon every portion of the paper simultaneously with much force and vigour.

Mr. Leake had never found the tones of his prints toned by the alkaline gold bath injured by prolonged washing. He recommended the use of a sponge, but thought not less than twenty-four hours' washing would secure the print from fading in a very short period.

Some discussion ensued upon the use of ammonia, &c., which was continued so long that a third "jotting," by Mr. Clarke, upon a few experiments he had made with the various salts of silver was necessarily postponed.

A vote of thanks was passed to Mr. Wall.

A paper by Mr. F. Howard, upon *Photography from an Amateur's Point of View*, was announced by the President, who also promised a paper upon *Photography as Allied to Science* for the meeting after the next.

An enlarged photographic copy was presented for the folio by Mr. F. Howard. A new pocket binocular stereoscopic camera, with an ingeniously contrived, though very simple, method for taking instantaneous pictures, was exhibited by the inventor and manufacturer, Mr. W. Clarke. The Society's presentation print was also distributed, and elicited much approbation. The meeting was then adjourned.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The twenty-third ordinary meeting of this society was held on Monday, the 19th ult., at the Golf Club House,—the President, J. Glaisher, Esq., F.R.S., in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. Charles J. Busk proceeded to read a paper *On the Reproduction of Engravings, Prints, Ordinary Writings, or Letterpress, on Prepared Papers, by Contact in the Dark.* [See page 98.]

A cordial and unanimous vote of thanks was tendered to Mr. Busk for his interesting communication.

The President then said:—You are aware that the Collodion Committee appointed by the London Photographic Society has made its report. I have read the report with some surprise; and, as I think it is the duty of societies like our own to do all in their power to prevent those who are looked upon by the public as photographic guides from leading them astray, I shall call upon Mr. Heisch to make some remarks on the report.

Mr. Heisch said:—Sir, in March 1859, the Photographic Society of London appointed a committee to examine collodions, with a view, as stated in the report before us, of arriving at a definite formula.

The report of that committee was to have been discussed at the last meeting of the society: all who were present will remember how abruptly the discussion was concluded.

It is not, however, to comment on this subject, nor on the strange position in which a society places itself by appointing a committee to examine and report on an important subject, and when that committee makes its report, neither adopting, rejecting, nor even discussing its recommendations, that I now come forward. Had the committee confined itself to matters in which only the society appointing it was concerned, I would not have been the one to meddle in other men's matters. I should not have said one word to-night did I not feel that a great injustice has been done to the public in general, and the manufacturers of collodion in particular, by the wording of this report. I acquit individual members of that committee of any intentional injustice, but that injustice has been done I fearlessly assert.

Sir, the report of the committee states that the collodion made by Mr. Hardwich is, "in regard to sensitiveness, unsurpassed." That "it is of superior excellence," and they "confidently recommend the society to stamp it with the full mark of its approbation." Sir, if these words mean anything, they mean that in the opinion of the committee this collodion is more sensitive and altogether better than any other in the market.

Now, sir, there are hundreds of people, who have neither time or inclination to examine various samples of collodion for themselves, who will receive this as an authoritative judgment, and will not even take the trouble to examine the report, and find out—what would surprise any one who reads the words quoted—that the collodion in question was never compared with any other; and, moreover, that the facts concerning its working properties detailed in the report form but a very slender foundation for such unqualified praise. Makers of collodion will naturally feel delicate in protesting against this report, and it is on this account that I feel that we, who are neither makers or vendors of collodion, ought to come forward and protest against a society, supposed to be the leading photographic association in England, putting it into the power of any tradesman to use its name in proclaiming the superiority of the article he sells, more particularly when we consider that the article in question has not been compared with that of other makers.

I will now say a few words on the report itself to justify the observations I have made.

First, we are told that the collodion is "comparatively, if not entirely, free from glutinosity, crapy lines, contractility, and other defects of film, met with some years back." Now, sir, I would ask, with what has it been compared? Certainly not with any of the first-class collodions in the market, many of which are *entirely* free from any of these defects.

Next, we are told that it "sometimes contains too much soluble cotton for large plates, and occasionally requires thinning down in hot weather. These words "sometimes" and "occasionally" are very significant, showing, as they do, that the collodion is not always alike. Another proof of want of uniformity is, that Mr. Fenton states that on using some of the earlier samples of the collodion he was obliged to roughen the edges of his largest plates to prevent the film from curling off, but that with subsequent samples it was unnecessary. Were these last samples made according to the formula originally sent to the committee? If so, it is clear its results are not always uniform; if not, it cannot be called the same collodion.

Next, we are told of a tendency to irregular drying. This, however, is said to be inconvenient, but not insuperable.

We now come to its sensibility, which we are told is, in the opinion of the majority, "unsurpassed." To justify this expression it should have been compared under the same conditions with every other collodion, which there is no pretence even that it was by the majority, while the only member of the committee who compared it with any other found that it took double the time. An attempt is made to explain this by the fact of his using a weak developer; but as we may fairly presume he used the same for both collodions, the explanation is far from satisfactory. Mr. Frith's private letters are here pressed into the service, but they will not do much towards proving the unsurpassed sensibility of this collodion with those who have seen the instantaneous pictures of Mr. Lake Price and others, taken with other collodions, not in the clear light of Cairo (which contains, according to the careful experiments of Bunsen and Roscoe, more chemical rays than the light in any other part of the world yet examined), but in London—not on four and a half inch plates, but on twelve inch plates.

With regard to keeping properties, unless iodised with cadmium it loses its sensibility in two or three days in warm weather—no slight defect in most people's opinion!

In speaking of the gradation of tone in the pictures produced with the collodion, after many rather contradictory remarks, the committee conclude that it is "sufficiently good." Sufficiently good for what purpose?

One gentlemen next speaks of transparent spots with tails, and two or three, of fine black lines. Curious defects in a collodion to be stamped as of superior excellence by the Photographic Society!

One point mentioned by Mr. Fenton strikes me as very remarkable, viz., that when used with the addition of bromide it will not bear the least over-exposure. With all collodions which I have tried bromides enable them to bear a much greater amount of exposure without injury.

I cannot but remark that, though three formulæ were sent in, not one word is said of two of them; and the gentleman charged with examining them, only says he assisted at the preparation of Mr. Hardwich's collodion, but does not say whether he succeeded in preparing it without that gentleman's assistance.

Now, sir, let me sum up the facts of the report.

1. The film is not quite structureless.
2. Its properties are not quite uniform.
3. When compared with other collodions it was not so sensitive.
4. It has no keeping properties unless iodised with cadmium.
5. There are complaints of transparent spots and dark lines.
6. When bromised it soon solarises.

Yet this collodion is to be stamped with the approbation of the London Photographic Society as of superior excellence, and unsurpassed sensibility! If I could believe such a thing possible, I should be inclined to say that the committee must have furnished the facts, while some other individual has drawn the conclusions.

I beg to have it understood that I offer no opinion on the merits of Mr. Hardwich's collodion: I point out only the discrepancies of the report.

I am perfectly aware that much of what has so strange an appearance may be capable of explanation; and I have made these strong remarks to-night, partly with a view of giving the committee that opportunity of explanation which was denied them at their own society.

The injustice to other collodion makers cannot be explained away, and it is against this that I wish our society to protest; but this unfavourable impression so commonly, I may say so universally, entertained of the report itself, may, I trust, be at least partially removed. At the same time I cannot but remark that Mr. Hardwich's letter, published in the last number of the *Journal of the Photographic Society*, will rather increase than diminish that unfavourable impression. Mr. Hardwich puts himself prominently forward as the champion of the report, forgetting that he is not one of those who signed it, and is therefore not answerable for its contents, and forgetting also that he is the manufacturer of the article which is reported on.

After some remarks to the same effect from other members of the society, Mr. H. Williams proposed and Mr. J. T. South seconded the following resolution, which was carried unanimously:—"That the remarks of Mr. Heisch be adopted as expressing the opinion of the society."

The meeting was then adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The ordinary monthly meeting of this society was held in George Street Hall, Edinburgh, on the evening of Tuesday, the 13th ult.

The chair was occupied by Sir David Brewster, President of the society. The following gentlemen were admitted by ballot, as members:—Messrs. P. Stewart, R. Cowan, R. Romanes, W. Younger, J. L'Amy.

The Secretary read a paper *On Composing and Printing Single Photographs from Several Negatives*, by Mr. H. P. Robinson, of Leamington, to whom was awarded one of the Society's Medals for the best group in the Exhibition. [See page 94.]

There was no discussion on Mr. Robinson's paper.

Mr. Macnair gave a more detailed account of the process for preserving the sensitiveness of collodion plates, which he had discovered a few months ago. This process, he said, consisted, in brief, in coating an excited and washed collodion plate with an infusion of malt, which was dried by the application of heat, and, after exposure, the plate was developed by a solution of sulphate of iron, the preservative solution having been previously removed by copious washing, and the plate wetted over with a solution of nitrate of silver, by immersing in the bath for a short time. The negative might not be dense enough to print from in this state, but density might be attained by pyrogallic acid and nitrate of silver employed in the usual way.

In the course of some interesting remarks on the changes grain underwent in the process of malting, he stated that the malt in a dry state contained gluten, gum, starch, and a sugary matter which did not crystallise, and which he believed could not be crystallised without sulphuric acid, or by some other chemical process; that when an infusion of ground malt was made at a proper temperature, a rapid conversion of the starch, as well as nearly all the gluten and gum, took place, and the whole was changed into a new sweet matter; that the conversion could be checked at any stage, and that the best state for the purpose was when the infusion, when dried upon the plate, was least deliquescent, and contained only sufficient quantity of this grape sugar to allow it to be readily washed off the plate after exposure.

He concluded by saying that a few ounces of malt would make an infusion sufficient to coat some dozens of stereoscopic plates, as three ounces would make fully half a pint.

Mr. Macnair showed several specimens of negatives and transparencies taken by this process, which were much admired.

Mr. Orange said that he had, at the request of Mr. Macnair, wrought a good deal by this process of late, and he could speak very favourably of it. He exhibited some pictures as illustrations of its capabilities, and, in answer to a question, said that it was necessary to use the wort while new, as it did not keep long.

Dr. Walker said he also had tried it, and although he did not think it

would supersede other processes, yet he thought its simplicity and certainty would recommend it to many. He had recently, on a visit to Dumfries, exposed some plates which Mr. Orange had prepared for him, and which he exhibited. [Dr. Walker's negatives displayed great artistic skill.] The exposure, he said, was not much longer than he would give a wet collodion plate.

Dr. PATTERSON said that, seeing the many changes which took place in the process of malting, and the great difficulty of procuring two specimens of wort which should be alike in every respect, he thought that the best way would be to make an analysis of that sample which should by experiment be found best adapted for the preserving of collodion plates.

This was unanimously agreed to.

After some remarks from Mr. NICOL on the chemistry of wort, and the peculiar changes the grain underwent in malting,

Sir DAVID BREWSTER brought Mr. Skaife's Pistolgraph before the notice of the meeting.

The subject of instantaneous pictures elicited a discussion between Sir David and Mr. J. T. Taylor, in which the latter defended large lenses, and the former denied the possibility of producing by the lenses ordinarily employed in portraiture, pictures which could at all lay claim to accuracy.

Sir DAVID BREWSTER also called attention to the fact that Mr. Skaife had patented a process for protecting the film by enamel. This he did by covering the glass photograph by a plate of glass, and subjecting the whole to a considerable heat.

Mr. TUNNY (examining a specimen which Sir David had handed to him) said he rather thought that the surfaces of the two plates were not throughout in entire contact, but that such contact was confined to the edges alone; but if Sir David would allow him, and risk the destruction of the picture, he (Mr. Tunny) would endeavour to separate them and see if he were correct in his surmise.

Sir David consenting, Mr. Tunny inserted the edge of his knife between the two surfaces, and found that it was as he had anticipated.

The meeting separated at the usual time. There was an average attendance.

LIVERPOOL PHOTOGRAPHIC CLUB.

THE usual meeting for the month was held at the residence of Mr. Forrest, on the 13th ultimo.

Mr. COOK exhibited some very highly interesting views, belonging to Mr. Pooley, representing all the horrors of the Arctic seas. They were the work of Doctor Walker, who had accompanied the expedition of Captain Sir L. M'Clintock, in the *Fox*. Photography in these hyperborean regions must be pursued under difficulties indeed; and the public are much indebted to the spirited operator who so perseveringly prepared for their gaze such faithful presentments of those dreary scenes, regarded with the painfully wrought interest that all have felt for everything that relates to the late lamented Sir John Franklin. As an apt accompaniment to these melancholy evidences of the fearful past,

Mr. KEITH exhibited some very well-executed views he had just taken at Moelfra, so celebrated for the fearful wreck of the Royal Charter. One was a very lively picture of the adjacent village, and another, the present scene of the late frightful calamity. The recent low tides had revealed, as it was expected they would, more of the remains than had ever before been seen, and thus was shown so accurately by the camera all the terror of the place that the inevitable fate of the doomed ship could be well judged by this view. A more fatal spot on this iron coast could hardly present itself, and yet a little more than her own length on either side of this tongue of rocks might have prevented the dread sacrifice.

Mr. COREY commented on the omission of all mention of a valuable contribution of Mr. Cauty's, at the last meeting. This was a photograph of a patient in one of the infirmaries, who had a very extensive and strongly-marked dislocation of the hip-joint. The head of the thigh-bone was so much displaced as to be firmly imbedded in the hollow of the *ossa innominata*, so that the heel of the foot was turned directly outward, and the toe, consequently, pointing to the inner *malleolus* of the other foot. This was a highly useful and instructive application of the art of photography, as it would enable students, and even adepts, in the healing art to recognise the nature of the injury in future cases at a single glance.

Mr. CAUTY stated also that he had had signal success with plates prepared as recommended by the Abbé Despratz, viz., the addition of one-third of a grain of fine common resin to each ounce of collodion. This entirely superseded the use of any preservative medium, if we except slightly washing each plate twice.

Mr. Glover, in apologising for his absence, sent a letter, speaking in terms of strongest praise of the mode of printing by the method recommended by Mr. Maxwell Lyte. Its chief qualifications, he thought, were its simplicity; its being ever ready for immediate use; its freedom from stains; and there being no necessity for heating, as in the rival process of Mr. Hardwich. At the risk of repeating an oft-told tale, the formulæ he uses are those advised by Mr. Shadbolt, viz:—Take of

Phosphate of soda	30 grains.
Chloride of gold	1 grain.
Water	8 ounces.

Dissolve in equal proportions of water and mix. Sufficient for four pictures eleven by nine inches.

At the close of an extremely social and very intellectual evening, it was decided to hold the next meeting at the residence of Mr. Keith.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The Wet Process v. *The Dry.*

ON Tuesday evening, the 27th ult., the monthly meeting of the above society was held, and the attendance of members and friends was more numerous than usual, owing to the interest taken in the friendly tournament got up between the advocates of the wet and the dry processes. It originated in a paper communicated to the society by Mr. Shadbolt, the editor of this Journal, in which certain phenomena connected with the use of Dr. Norris's dry plates were incidentally referred to. During the conversation which ensued, Mr. Charles Breese, a gentleman whose very fine works have been seen by few besides his friends, dropped an opinion that none of the dry processes were equal to the production of a really good artistic picture. He admitted that he had never used the dry process, and had seen comparatively few proofs of what it could produce, but he considered that those he had inspected justified the opinion he had expressed. To use a sporting phrase, Mr. Breese was challenged to "back his fancy," and Mr. W. B. Osborn and other "dry" professors undertook to do what they could on behalf of Norris, Fothergill, and Coy.

Mr. Haines occupied the chair on Tuesday evening; and Mr. OSBORN, having briefly explained the origin of the friendly "trial of strength," Mr. BREESE produced a collection of his own pictures, as proofs of what could be done with the wet process. These, thirty or forty in number, embraced views of the sea in some of its most opposite aspects, photographs of cloudland, moonlight scenes, a view of the recent eclipse of the moon, street views taken during the Queen's visit to Birmingham, architectural photographs, waterfall pictures, &c. Some of these were included in the fine series which Mr. Breese had the honour of sending to the Queen, by Her Majesty's commands, in the winter of 1858, and which were at the time described in the Journal. Independently of the combination of skill and scientific knowledge which enable this gentleman to portray clouds of all complexions and sizes, to suspend a wave in mid air, and give us its likeness as its foaming crest is dashed back by the land breeze, to transcribe faultlessly the life and bustle of a town *en fête*, to work with his camera when the sun is shining on New Zealand, and when even Luna herself is half extinguished—independently of these rare qualities, the gradation of tone and sense of distance which his pictures possess were admitted to be as nearly perfect as anything the art of photography has yet produced: all were instantaneous stereoscopic pictures on glass. While the wet process was thus worthily represented, the merits of the dry process were also supported by a large number of first-class specimens, contributed chiefly by Mr. Osborn and Dr. Hill Norris. The collection shown by the former included an album of large pictures, taken by the Fothergill process, and kindly sent for the occasion by Mr. S. Bourne, of Nottingham. Mr. Breese's objection to the dry process was, that he had never seen any which gave sufficient atmosphere and distance; but some of Mr. Bourne's pictures seemed all that could be desired in both respects. As regards distance, the *Views of Windermere* and *View from Lancaster* and *Tintern Abbey* were especially noticeable, the half-tone and fullness of detail in the latter being very satisfactory. In half-tone effects *Audlem Church*, Cheshire, and *Lincoln Cathedral*, might be said to be perfect, and *Milford Church*, Notts., was not far behind, while the *Views of Dovedale* gave atmosphere in perfection. Mr. Woodward, of Nottingham, also sent a collection of stereoscopic paper slides, by the collodio-albumen, including some of the finest "dry" works we have ever seen. For half-tone his *Jedburgh Abbey*, *Fountains Abbey*, and *Cottage at Milford*, were much admired, as was also his *Peterborough Cathedral* for distance; and a beautiful scene, with water, taken in Burghley Park, was admitted to be perfection itself. Dr. Hill Norris contributed some twelve by ten inch pictures, which were very good, and a number of exquisite transparencies, by his process, which were pronounced equal to any wet plates yet produced, except the instantaneous ones—his *York Minster* being pronounced the best. Mr. Seymour, Mr. Bright, and Mr. Applewhaite, of Leamington, contributed several very good negatives by the Fothergill process, the latter gentleman showing one taken in sixteen seconds. Mr. Osborn's were greatly admired, being all by Dr. Hill Norris's process.

The various pictures having been carefully examined by the meeting, Mr. OSBORN remarked, that the comparison which had that evening been instituted between "wet" and "dry" was scarcely a fair test, because he did not know any photographer who had ever produced anything equal to what Mr. Breese had shown them. It was not contended, for instance, that dry photography would produce instantaneous pictures, though he hoped the time was not far distant when this would be done. But the dry pictures they had been inspecting proved that both distance and atmosphere could be produced by competent men. The great advantage claimed for dry photography over wet was, that in using it photographers were not obliged to encumber themselves with a great amount of heavy apparatus, and were thereby less liable to suffer inconvenience from forgetting to take with them some trifling but very necessary part of it. Wet photography, too, often made a toil of what should be a pleasure. He did not believe that dry photography would ever entirely supersede

the wet; but he was prepared to contend that the pictures he had shown, especially those of Mr. Bourne, were not only *quite* equal to any of the ordinary wet collodion photographs, but superior to many from their abundance of half-tone, general pleasing effect, and clearness and freedom from spots.

Mr. Breese remarked that some of the Nottingham pictures showed that where they got the best distance they had the worst foreground.

Dr. Hill Norris asked whether Mr. Breese was of opinion that if the dry process were equally rapid with the wet, the results obtained would be equal?

Mr. Breese: No; I do not think the dry can copy the atmosphere as delicately and truly as the wet.

Dr. Norris: As a chemist I cannot see why there should be any difference, as in both cases the light has the same sensitive material to act upon. I think that if we can make the dry process as rapid as the wet, we shall certainly succeed in securing the whole effects Mr. Breese has shown us to-night; and I am very sanguine that this will be done. [Dr. Norris produced some dry pictures which he had taken in from five to twenty seconds.] He remarked, as to Mr. Breese's observation about good distances having bad foregrounds, that if the sensitive material to which both were exposed were equal, it followed as a necessity that the more distant object would be the sooner printed, and that the nearer object would require greater exposure to bring it to the same degree of intensity. If a plate would bear exposure for the most distant objects without being overdone, then certainly that plate, whether it be wet or dry, is capable of rendering all the effects in the foreground.

Mr. Breese: The argument may be very good scientifically, but I do not see the result in practice. In one of the best dry pictures I have seen to-night the foliage in the foreground does not appear.

Dr. Norris: That is because the picture is not sufficiently exposed.

Mr. Breese: And yet you have the distance,

Dr. Norris: It is necessary in all cases, whether wet or dry, that the distance should be over-exposed, in order to bring up the foreground, simply because the light that comes from distant objects is concentrated into smaller space. What I contend is, that if we had a dry film sufficiently rapid, we should get as good pictures as with the wet. In comparing dry collodion with wet, you must take the productions of a host of individuals, and I dare say you will find very good and very feeble results on both sides. I certainly cannot see how the wet process can excel the dry in any other respect than that of rapidity.

Mr. Breese: Which is a very important matter.

Dr. Norris: But still we are not without hope.

Mr. Breese: No; but we are simply talking about how far the process has been carried out. Is it anywhere near the wet process at the present time?

Dr. Norris: The dry process is constantly producing results which are exhibited by old "wet" operators, without its being detected that they have changed their process.

Mr. Breese: That will depend a good deal on what the operator can produce with the wet, and would not say much for either process.

Mr. Osborn: There you are greatly in error, as the gentlemen alluded to are first-rate wet operators.

Mr. Johnstone said that, in the matter of distance and foreground, all must know that a great deal depended on the mode of development. If they tilted up a picture so that the greatest amount of fluid lay on the distance, the foreground would develop in a much greater degree than if they were to get the fluid over it. Again, in rendering a daguerreotype plate sensitive, certain definite proportions of iodine and bromine produce certain results. Two of bromine to one of iodine produced a clearly defined picture, but with a tone somewhat unusual: equal proportions gave a picture that looked as if it had not been well focussed; but if the proportion of bromine were increased to exactly three, a well-defined picture would be the result. Why should not this principle of coating be attained on dry collodion plates? Most of the compounds of collodion had bromides in various proportions, but the plates were of much the same degree of sensitiveness.

Dr. Norris: Does not Mr. Breese attribute some of the perfectness of his results to the use of bromide of silver with his collodion?

Mr. Breese answered in the negative, and, in reply to another question, said that his negatives did not take more than the tenth part of a second in their production. None of his pictures took more than five or six minutes to develop.

On the motion of Mr. Brown, seconded by Dr. Norris, a cordial vote of thanks was passed to Mr. Breese for his kindness in attending the meeting; and in acknowledging the compliment, Mr. Breese admitted that he had that evening acquired an appetite for trying what he could do with the dry process. He had certainly seen better pictures than had previously come under his notice.

Mr. Osborn moved a vote of thanks to Dr. Norris, which was seconded by Mr. Ball, and unanimously passed.

The stereoscopic pictures inspected during the evening were seen to much advantage by the aid of the new patent achromatic stereoscopes, manufactured by Messrs. Cutts, Sutton, & Co., of Sheffield. They were acknowledged to be exceedingly perfect instruments, free from the slightest distortion, and of great power.

The meeting did not break up till half-past ten.

It is expected that Mr. Sutton, of Jersey, will be present at the next meeting, and read a paper *On Panoramic Photography*.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this society was held at the Chorlton Town Hall, on the 14th ult.,—Mr. Nicholson, Vice-President, in the chair.

The minutes of the last meeting were read and confirmed, and the officers of the society for the next year were proposed.

A note from Mr. Wardley was read, stating that owing to indisposition he should be unable to attend and read the paper he had promised.

Mr. Griffiths read a paper, entitled *Observations on a Method of Enlarging and Multiplying Negatives*. [See page 96.] He also exhibited two prints, which were much admired. His camera was quite a miniature, and the stand rigid, although, when folded, it had the appearance of a substantial walking-stick—quite a curiosity in its way.

Mr. Hooper afterwards explained the mode he employed of obtaining enlarged pictures, very much in the same way as Mr. Griffiths, and exhibited some very fair specimens, but not so full of half-tone as he hoped to produce them.

A vote of thanks to Mr. Griffiths for his interesting and useful paper was carried, and also to the Chairman for presiding, which concluded the business of the evening.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

PREPARATION OF THE PHOTOGRAPH.

The albumenised prints are not so frequently chosen by colourists as those on plain salted paper, because the colours adhere better, and the washes can be repeated with more safety on the latter than the former; but some exquisitely beautiful effects have been obtained on both the one and the other. The albumenised paper gives softer gradation and better detail. To assist the colourist in securing for the latter the advantages of the salted paper, Mr. Newman has recently prepared a solution which, while it answers admirably for the preparation of the prints on both papers, has the excellent quality, when used with water as a medium for your colours, of enabling you to repeat the washes without fear of their being disturbed.

Many means of preparing the print have been adopted, some using ox gall, some isinglass with two or three drops of ox gall, some a weak solution of gum. Others use parchment size, containing a very small portion of alum; and others, again, a combination of distilled vinegar, borax, and gum-arabic; but I have found no preparation to surpass that already spoken of as manufactured by Newman. In preparing the salted paper you will find it more or less absorbent, according to the method of washing and fixing adopted. Some prints will require two, or even three coats of size, and others but one, while some may be used without any preparation. In spreading the sizing solution, do it evenly and thinly, that it may not assume the appearance of a varnish, and let one coat dry thoroughly before applying a second.

THE GUIDE.

This is a second print, much darker than the first, which the colourist places beside that he is about to colour upon, as a guide to assist him in preserving the drawing and details of the photograph. It should be printed upon albumenised paper, with every scrap of detail unmistakeably secured. When the negative is of that peculiar character which requires the drapery to be sacrificed to the proper definition of the head, or the contrary, two guides should be printed, one for the head and the other for drapery.

PRACTICE.

You have taken your seat at your desk, resolved to be very patient and particularly careful, or we will suppose you have done so. The water, brushes, colours, ox gall, gum water, and palette are at hand in a clean condition for work.* The picture before you is, say the portrait of a fair person of the fair sex (you shall have a dark one of the fair sex and some others anon). I would recommend you always to colour from the life, and never, unless impossible to do, without a sitting for the colouring; as the results will always be more satisfactory, and the practice infinitely more advantageous.

Foreign Correspondence.

Paris, March 26, 1860.

At the last meeting of our Photographic Society, M. Fordos read an interesting paper *On the Employment of Salts of Gold in Photography*. He explained how necessary it was that the chlorides should be perfectly neutral, for if they contained any acid—and the commercial chlorides generally do—they decompose the hyposul-

* See the number for December 1st, 1859.

phite of soda, and cause *sulphurising* of the proofs; for the re-action of the acid of the chloride of gold upon the hyposulphite liberates hyposulphurous acid. *Sel d'or*, which is composed of hyposulphite of gold and of soda, is preferable to chloride of gold, as it does not tend in any way to produce sulphurisation; but it is less economical, inasmuch as it requires three drachms of *sel d'or* to produce the same toning effect as two drachms of chloride of gold.

M. Fordos recommends, as a substitute for chloride of gold and *sel d'or*, the double chlorides of gold and sodium, or of gold and potassium. These double chlorides contain as much gold as the commercial chlorides of gold, and may be employed in the same proportions. They are neutral, and have an invariable composition; they are also very stable, and do not attract humidity from the air; they can be kept for use in large quantities; no difficulty will be experienced in weighing them out, as they do not liquify like the chloride of gold. The preparation of these double chlorides of gold and sodium, or of gold and potassium, is not at all difficult; and it is desirable that they should immediately supersede the chloride of gold and *sel d'or* now employed for toning.

Woodward's solar camera has produced no little commotion in the photographic world. Great pains have been taken to prove that it is neither new or good: many claimants have come forward to show that in years gone by they imagined or invented something like it, but none appear to have contrived the thing itself. The discussions it has caused will doubtless lead to the production of an instrument as perfect as science can make it. M. Bertsch read an interesting communication on this subject before our Photographic Society, to which I beg to commend the attention of your readers. J. P.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

APLANATIC LENSES.

To the Editor.

Sir,—I have waited to the present time in hope that Mr. Wilson, of Aberdeen, would, by replying to "X's" letter in your number for February 1, have relieved me of the necessity of myself replying to the subject matter of that letter.

Mr. Wilson could have told you how a hasty expression in a letter of his to the editor of a contemporary was caught at by the latter, and that he (Mr. Wilson) reluctantly, and only on the urgent solicitation of the said editor, consented to a modification of that expression being published. Mr. Wilson could also have told you that this hasty expression was induced by a query from the said editor, as to what lenses he used in taking a certain photograph having so much distortion—the question of distortion thus arising altogether with the editor, and not with himself.

Mr. Wilson could also have told you that his disappointment, as expressed (well or ill-founded), was confined to distortion, and, consequently, had no reference to fogging—Mr. Wilson limiting his statement respecting the lenses to this, viz., that he was disappointed in their working. Anything more than this is (according to Mr. Wilson's letters to myself) not from Mr. Wilson, nor with his authority.

To which, I am enabled to add (but from another source) as follows, viz.:—That the said editor has not merely expressed his opinion, but *given his "ipse dixit,"* that everyone knows, except myself, apparently, that my aplanatic lens has "*precisely the same*" *distortion as the ordinary single achromatic view lens.*

Now, I think that every one reading the article by the editor, referred to by "X," must consider it as an attempt to show that the results of a first rate photographer, using the aplanatic lens, are—foggy pictures, and with more distortion than if taken by an ordinary view lens.

That the aplanatic lens, *being a single cemented compound*, can be more liable to produce foggy pictures than any other single cemented compound, is not only grossly absurd, but, also, it comes not from Mr. Wilson. That both of these compounds are far less liable to produce foggy pictures than more complex ones, and especially than the lens or lenses known under the appellation of symmetric triplets, are facts which can no longer be disguised from those interested in such matters. That the aplanatic lens has more distortion than the ordinary view lens has been, and perhaps still is, the opinion of Mr. Wilson; but the editor before-mentioned, in craving for leave to publish that opinion, was urging for the opportunity to put before his readers (fortified by the judgment of a first-rate photographer) *that* which his aforesaid "*ipse dixit*" *declares cannot exist.*

Taking here a slightly retrospective view, the original question of the editor to Mr. Wilson was *(coming from him)* entirely superfluous. *From the kind* of distortion exhibited by the photograph, no other lens extant than either the aplanatic or the ordinary meniscus *could have been used;* and if the editor knew, in accordance with his *ipse dixit*, that *these have precisely* the same distortion, the *cui bono* of his question does not appear. I shall here mention a slightly collateral circumstance.

From Mr. Wilson's letters to me it appears that the inquiry made of him was respecting a view of *Holyrood*, and that he replied, "these views of Holyrood," &c.; whereas, in the editor's letter to myself (in which he states that he quotes from Mr. Wilson's letter, which is now before him) the quotation runs thus—"Those views of ———, where the pillars," &c. Now, the photograph enclosed to me in the same letter is *not* of *Holyrood*, but of *Melrose*. I might have supposed the substitution of the photograph of *Melrose* for that of *Holyrood* to have been accidental, but for the apparently non-accidental blank in the letter. If the distortion were equal in both photographs, there would be no reason for substitution. The view of *Melrose* was probably *not done* by the aplanatic lenses.

I now come to discuss that part of the matter in hand, which is alone generally interesting to photographers—viz., the correctness or not of Mr. Wilson's deductions respecting the distortion produced by the aplanatic lens. I would desire to preface the observations which follow by stating that I am quite convinced of his acting with perfect sincerity throughout, though not with corresponding judgment, and I here thank him for replying to my queries.

When Mr. Wilson received the lenses, now twelve months since, he expressed himself pleased with their appearance (he had seen something of the aplanatic lens before with a friend); it was ten months after, and through an adverse channel, that I first learned his "disappointment." I wrote to him, and received in reply his letter of 10th November, which states—"Indeed this" (viz., his visit to Holyrood) "was the first time I had given them a fair trial, and I have never used them since." The same letter announces his having reluctantly authorised his disappointment in the lenses *to be published.*

Of the correctness of the deductions of Mr. Wilson from this one "fair" trial I have now to speak. The trial was a comparative one; the data I take from Mr. Wilson's letters and photographs, the latter being taken with a pair of aplanatics and a pair of the ordinary view lenses, the camera being stationary. The relative foci of the two pairs of lenses, obtained from the measurement of certain definite portions of the images, proves to be as eight to ten.

Now, supposing the lenses to be of *precisely the same construction*, the distortion for a field of a given size would be inversely as the squares of the foci, or in the case before us—100 parts for the shorter focus to 64 parts for the longer. To represent this graphically I describe segments of two circles in this proportion, say of 5 and 3·2 inches radius, and draw a straight line through each segment, intersecting it at two points similarly distant in each. The diagrams so produced show by inspection the proportional distortion of the two foci of lenses used by Mr. Wilson *(supposing the lenses to be of precisely similar construction).* How far Mr. Wilson has made due allowance for this difference may be understood from his own words:—"The second pair of lenses are of slightly longer focus than yours, which may make some difference." (!)

The reason of Mr. Wilson's disappointment in the performance of the aplanatic lenses is not, however, confined to his ignoring a difference of 100 to 64 in the distortion necessarily attendant upon the difference of focal length of the two pairs of lenses. His same letter states as follows:—"When I looked at your lenses first, I thought them good; but I had them directed at rather distant objects at that time. At Holyrood, however, I found great difficulty in getting both lenses to give the *same distortion*; and, if I recollect rightly, I had to turn one of them round a little, and out of focus, before I could get that large window to lean the same way in both views. The images were something like this,* and as I turned round one of the lenses the images turned also, until I got them both to lie in one direction.† When Mr. ——— showed me his pair, I expected they would be suitable for taking such as the samples which I enclose,‡ as he said they would work with a large diaphragm. I was obliged, however, to revert to my old pair of common lenses," &c.

Need I observe, that the extraordinary kind of distortion which Mr. Wilson has here so accurately described, as well as his curing it by turning round one of the lenses, and thereby putting that view out of focus, were both imaginative on his part? I wrote to Mr. Wilson at length, showing that such phenomena were irreconcilable with the circumstances of spherical surfaces and a centred lens, and mentioning something which might have led to his error. I also begged him to send me the lenses for my personal examination and at my own expense. Mr. W. has since acknowledged that there exists neither the impossible defect in the lenses nor the possible defect in the mounting. He declines sending me the lenses for examination, and concludes by stating that he has just the same opinion of the lenses now as when he wrote to your contemporary, viz., that he was disappointed in them.

Under such a declaration, *made in the face of the acknowledged erroneous deductions of the "fair" trial*, I have thought it quite useless to pursue the question further with Mr. Wilson, and I think it better to leave it in the hands of your readers.—I am, yours, &c.,

Dublin, March 16, 1850. THOMAS GRUBB.

* Diagrams were here given of pictures leaning off from each other.
† Diagrams here given of pictures erect.
‡ Instantaneous photographs.

BLACKING BRASS MOUNTINGS.

To the Editor.

Sir,—Will you have the goodness to favour me with a formula for blacking brasswork, such as the manufacturers of philosophical instruments use for the inside coating of telescopes, lenses, &c. — one that will not offer a shining or reflecting surface.—I am, yours, &c.

March 10, 1860. RUSTIC.

[Take common spirit lacquer, such as you purchase at the varnish shops, and, after rubbing it up in a mortar with the finest lamp black, filter through calico or muslin. In using this material you must not overlook one point, viz., to make the brass-work sufficiently hot to volatilise the spirit almost immediately, otherwise the surface will be shining, instead of presenting a dead black.—Ed.]

PORTRAITS IN THE OPEN AIR.

To the Editor.

Sir,—I am a constant reader of The British Journal of Photography, from which I gather a great deal of useful information. At present I am at a loss on the following subject:—Having no glass room, or convenience for erecting one, my portraits must be taken in the open air, and, consequently, I seldom succeed in obtaining a good one. I have some idea of making a moveable screen for the sitter, after the manner of the screen we generally see carried about at the performance of Punch and Judy. I should feel much obliged by your kindly telling me, in your next Journal, whether you consider such a screen likely to answer my purpose, and, if so, what height and width it ought to be, and what kind of material you would recommend the sides to be covered with.—I am, yours, &c.

March, 1860. J. R.

[To make such a screen as you require, construct, in the first instance, a strong deal framework, consisting of a central portion with two lateral ones hinged to it. Cover the whole with oil-cloth, painted of the colour of brown paper, and as free from gloss as possible. By bringing one of the sides forward, you are enabled to throw a shadow on a part of the face, and by turning the other side back, you fix the whole arrangement, and make it firm. Probably a screen will be required above to cut off the vertical light from the head; and, if so, the apparatus may be still further strengthened by constructing this part of a deal framework, made to bolt down against the side which projects forward. Do not omit to shield the front glass of the lens from diffused light, by a funnel about a foot long, open at the end; and remember also to throw a black cloth over the camera during the exposure.

With reference to collodion, the negative collodion employed for portrait-taking in glass houses is not always the best for open-air work, the light being so much stronger, and, consequently, producing a more intense negative. A bromo-iodised collodion, such as is generally used for the Fothergill dry process, gives a very soft picture, and the proper mode of developing it is to begin with sulphate of iron, and intensify subsequently with pyrogallic acid; or, if you prefer it, pyrogallic acid may be used alone, the strength being three grains to the ounce of water, with twenty minims of glacial acetic acid. The bromo-iodised collodion will improve by keeping for a month in the iodised state.—Ed.]

ACETATE OF SILVER IN THE BATH.

To the Editor.

Sir,—I have taken photographic views, and copied engravings on plates of eleven by nine inches, and my success has been, on the whole, encouraging; but the great secret seems to me to lie in the proper constitution and management of the nitrate bath.

Mine contains about fifty ounces of solution, and was prepared about nine or twelve months ago with fused nitrate of silver (thirty grains per ounce). Some time ago it became acid, and finding the negatives inferior to what they had been, I neutralised the solution with carbonate soda, and added acetic acid. This treatment I have had occasion to repeat, but I find there is a great difficulty in keeping the plates from becoming solarised with the exposure necessary for the shadows.

What I wish to ascertain is, whether this unfavourable condition is owing to the formation of acetate of silver, and if so, how can it be corrected? The collodion I use has generally been iodised from a few weeks to three months.

I also should be very glad to learn your opinion on Mr. Thomas's suggestions, as contained in his papers in the *Journal of the Photographic Society*, and his preference for *nitric* acid.—I am, yours, &c.,

J. B. B.

[The effect of which you speak is doubtless due to acetate of silver in the bath, and it would be possible to remove this acetate by cautiously dropping in nitric acid until acetic acid had been set free. We think, however, that it might be worth your while to try, in the first instance, the effect of a developer containing *citric acid* (half the weight of the pyrogallic acid), which we have found to work well with a bath containing acetate, and, in a great measure, to remedy the solarisation. A bromo-iodised collodion, such as is used for positives, will also frequently give good negative landscapes and negative copies of pictures in a bath containing acetate.

Mr. Thomas's observations appear to us to be sound, but we are of opinion that they do not apply to all collodions; as collodion giving an intense negative will often work well in a bath faintly acid with nitric acid, but a weak collodion will not work well in such a bath. As regards oxide of silver for neutralising the bath, it is perfectly efficacious, but we find carbonate of soda to answer the same purpose: immediately on entering the bath it becomes carbonate *of silver*, and carbonate of silver acts as a neutraliser of acid, just as oxide of silver does.—Ed.]

ANSWERS TO CORRESPONDENTS.

Oxon.—A twin-lens camera is preferable.

Caustic.—We shall have much pleasure in introducing you.

Lotus.—The lime light is well adapted for the magic lanthorn.

Battley, A.—Crystallisable and glacial acetic acid are one and the same thing.

Æsop.—You are unwise to believe in such improbable advertisements.

Alcohol.—Spirits of wine will be cheaper under the new tariff.

Captain Scott.—Your *note* has reached us, but *not* the stereographs, as yet.

Boston.—By adding a solution of common salt you convert it into chloride of silver.

B. Jones.—Gum arabic produces a reddish negative when used as a preservative coating.

J. Martin.—Waxed-paper is used dry, and very excellent results may be obtained with it.

Old Hypo.—Add fresh crystals of hyposulphite of soda with every new batch of prints you put into the bath.

Archer, J.—You can obtain a daguerreotype apparatus at some of the dealers in photographic materials.

S. O.—The sediment in your developing solution is metallic silver in a state of fine division; decant the liquid.

Mellor.—There is a book on the oxymel process, published by Messrs. Chapman and Hall.

Photos.—Perhaps the lime light, or the Fitzmaurice light, will answer your purpose better.

Troy.—An ounce of nitrate of silver usually weighs 437½ grains, not 480, as you suppose.

Green.—You should have known better than to have put faith in such a palpable take-in.

S. M. G.—There is nothing new in your idea; it has been tried already and found wanting.

Watt, J.—Develop with protosulphate of iron, and afterwards strengthen with pyrogallic acid.

Duro.—Your proofs were allowed to remain too long in the toning bath: hence their cold blue colour.

Test Tube.—Your litmus paper should be kept in a bottle, covered, to avoid the action of the atmosphere.

Shotley.—The metagelatine process, as improved by Maxwell Lyte, was published in this Journal last year.

Paul.—Gelatine should not be mixed with the albumen for positive paper: it produces a very disagreeable gloss, much inferior to that obtained from pure albumen.

T. J.—If you can wait a few months, you will be able to get a copy of a new edition of the work you name.

Penelope Ann Spriggins.—Want of space compels us to postpone your communication till our next number.

Steady.—Your principle is a good one as a rule, but in this case we advise you to make an exception. Try it by all means.

Mark Haynes.—See Mr. Hughes's paper *On Toning*, in a recent number, or Mr. Maxwell Lyte's formula in our last volume.

J. M.—If you apply to the author of the paper he will doubtless forward the instrument to you, and we think that you may depend upon its answering the desired object.

F. S. W.—You will find exactly what you need in the last number but one of The British Journal of Photography, page 62.

H. N. King.—We have not forgotten you, but have really not had time to do what you require; our labour is constantly increasing. We hope to try it in about a fortnight's time.

Cantankerous.—You have shot at the wrong mark—*we* retired from the council of the society more than *twelve months* back (not agreeing with the policy then pursued), so that we are in no way responsible for the acts of which you complain.

H. A.—Plain or waxed-paper negatives may be intensified by coating them with a dilute developing solution, silver and gallic acid. The operation must be performed in the dark, and with great cleanliness.

Rt. M'L.—See an article in our last number on "Perspective and Distortion," also our leader in the same number, when you will be in possession of our opinion on the subject alluded to. On the other point you may consult our number for the 15th Dec., 1859.

Nil Desperandum.—If carefully prepared, kept in the dark, and protected from vapours of all kinds, you may generally calculate on them for a month. Whether you are to prefer the four-drachm washing, or the unlimited washing, will depend upon the state of the collodion—try a plate of each before starting.

T. L.—We cannot detect any defect in the print sent, excepting two little spots, which appear to be due to an impurity of some kind having touched the paper. The larger red spots to which you allude may perhaps be caused by your allowing the pictures to lie too closely together, so that the bath cannot act evenly.

Roberts.—If you suspect the spots to be due to floating particles in the [illegible], remedy them by a more careful filtration; but has it not occurred to you that possibly your apparatus may be a little stiff and out of order? at all events you can try the effect of cleaning the slide very thoroughly. We imagine that Mr Llewelyn adheres as a rule, to the oxymel process as he first described it, adopting the modification only when the collodion is unsuitable.

T. K.—See answer to J. M. We are of opinion that a careful washing will do more to secure the permanence of your prints than the application of a heated iron after drying, the effect of which would be difficult to explain satisfactorily.—Question 2. We do not recommend the general adoption of development by salts of iron: no one plan of development will answer equally well at all times. Use the salts of iron when, from any cause, you obtain too much intensity of negative, and the pyrogallic acid when the image is pale and flat. A proper strength for the iron developer is about ten grains to the ounce, with twenty minims of glacial acetic acid; and it will depend much upon the state of the collodion and bath whether pyrogallic acid should be employed subsequently.

Received.—J. G., W. B. C., J. B. B., Amateur. Will all receive attention in our next.

⁂ A pressure of matter compels us to leave over several articles in type, amongst which are Mr. Forrest's paper "On Glass," M. Bertsch's paper "On the Enlarging of Positive Proofs," "Letter" of Israel Holdsworth, &c., &c.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 116, Vol. VII.—APRIL 16, 1860.

A matter of no small interest has been recently placed before our readers with reference to certain experiments bearing upon the question of the proper fixation of positive paper proofs. We allude to those reported in our impressions of the 15th ultimo and the 1st instant, by MM. Davanne and Girard at page 82, by Mr. Hardwich at pages 93 and 94, and by Mr. Dawson at page 100; and we recommend all who regard the permanence of photographs upon paper as a matter of importance (that is, every photographer worthy of the name) to make himself thoroughly acquainted with the whole of the bearings of the subject. A careful re-perusal of these articles consecutively will well repay the trouble; for not only is the subject matter of vital interest, but it is not such as readily to be apprehended by the casual reader. We propose therefore to attempt a slight analysis of the propositions arrayed on both sides of the question.

MM. Davanne and Girard assert that a solution of hyposulphite of soda of the strength of ten per cent. becomes *saturated* with the double hyposulphite of silver and soda, as soon as the former has dissolved thirty-six grains of chloride of silver in the quantity of liquid containing twenty-five drachms of new hyposulphite of soda. They state also the fact that this so-called saturated solution is capable of dissolving a much larger quantity of chloride of silver; but that, in order that it may do so, decomposition of the alleged saturated solution, as well as of the chloride of silver, must take place, more of the double salt being formed, which is then precipitated from the quasi super-saturated solution, subsequently to which further decomposition is alleged to ensue with the formation of sulphate of soda, sulphurous acid, and sulphur. These gentlemen also say:—

> The sulphur thus formed will be deposited on the proof, side by side with the sulphide of silver, so that not only a part of the silver covering the proof will be sulphurated on leaving the bath, but it will also carry off a second quantity of sulphur, which, little by little, will sulphurate the unattacked silver and alter the proof, and consequently make it undergo a more considerable sulphuration.

On this point we offer a suggestion. If any free sulphur be formed it ought to be removable by immersing the print in bisulphide of carbon, and the sulphur subsequently recovered on evaporating the solvent. We quote another assertion of MM. Davanne and Girard, viz.:—

> If we take a quart of a solution of hyposulphite of soda, of the strength of 10 per 100, and stir into it forty grains of freshly-precipitated chloride of silver, the latter will be dissolved, and form the normally-saturated solution spoken of above. If to this saturated solution we add a second and then a third quantity of chloride of silver, equal to forty grains, these quantities will successively dissolve; but the solution will become unstable, and soon deposit, not the double white salt, but free hyposulphite of silver, which is immediately decomposed.

Now, in direct opposition to this assertion, we find from the experiments of Mr. Dawson, as reported at page 100, that ninety-six grains of hyposulphite of soda dissolved in half an ounce of water took up twenty-five grains of chloride of silver during the first day's experiments, and that, being left in repose for twenty-four hours, *no precipitate was formed*, nor did the litmus paper kept continually in the liquid exhibit *any signs of acidity.*

Again, turning to Mr. Hardwich's researches, we find that the only deposit produced was in the form of crystals of a double salt of hyposulphite of soda and silver, containing one atom of each base, that *not* being identical with the double salted treated of by MM. Davanne and Girard, which is the compound consisting of one atom of the silver salt to two atoms of the corresponding soda salt, and which Mr. Hardwich states to be *very soluble in water*, consequently, except the solution be considerably concentrated, not likely to crystallise very readily. No deposit of hyposulphite of silver, or of any other kind, was formed in either solution of Mr. Hardwich's, and even at the expiration of a week both remained clear and colourless: in that containing the chloride of silver equal to half the weight of hyposulphite of soda alone, sparkling crystals (not decomposed) were found.

In connexion with this subject we have been not a little amused at an editorial comment in the pages of a contemporary, after a report of the meeting of the North London Photographic Association, at which Mr. Dawson related the account of his experiments, which were consequently before the editor; and though those of Mr. Hardwich were not, the fact that an eminent chemist had completely corroborated Mr. Dawson's results was in evidence, for we find it recorded in the same page as the comment to which we adverted. This comment is as follows:—

> MM. Davanne and Girard's statement appears to have been misunderstood. Their assertion is simply this—a solution of hypo, of the strength of ten per cent., will dissolve only about one grain to the ounce before becoming saturated with hyposulphite of silver and soda. When so saturated, hyposulphite of silver is precipitated and immediately decomposed into sulphur and sulphide of silver, and sulphurises the proofs.

The worthy editor does not appear to perceive that the assertion so far from having been *misunderstood* was simply *confuted*—a widely different affair.

It is not unfrequently that we have to point out that alleged photographic novelties do not always consist in anything new. We are fully aware that this is a somewhat ungracious task; but we are constrained to select one of two evils—either we must be silent and run the risk of being twitted for our own want of memory by some correspondent, and at the same time commit an act of ingratitude towards the original introducer of something useful, or we must take the course which we constantly do, and brave the ire of the second in the field.

At the March meeting of the French Photographic Society, M. Fordos read an article *On the Preparation and Use of the Double Chloride of Gold and Sodium for Toning Paper Positives*, alluding to this salt as if it were but very recently brought into use for this purpose, though he stated that he had, in conjunction with M. Gelis, manufactured the article as long since as 1843, a period at which it was of course not applied for the purpose now indicated. We think it is, however, rather late in the day to regard as a novelty what has been in pretty constant use, in this country at least, for the last five or six years: first by the "printing

committee" in this country in 1854, at the suggestion of Dr. Percy, in order to avoid the inconveniences arising from the use of an acid salt like the terchlorides of gold; in short, it is the basis of what is known as Maxwell Lyte's gold toning bath, and has been still longer in use for extemporising a *sel d'or* bath,—which latter, by the way, M. Fordos still regards as the best agent for toning, on the alleged ground that sulphurisation is altogether avoided by its use. In this opinion we consider he is altogether mistaken; for we believe that the toning is effected by the sulphur attacking the silver, and thus causing the deposit of the gold in the metallic form.

In our last we puplished the report of a meeting of the Blackheath Photographic Society, at which matters of unusual importance were brought forward. In the first place, the paper by Mr. C. J. Busk, *On the Reproduction of Engravings, Writing, &c.*, not only presents to our notice some interesting and useful results, but tends to indicate the possible source of M. Nièpce de Saint Victor's supposition of having discovered some hitherto unknown action of light.

The essence of Mr. Busk's article appears to be as follows, viz.:—Paper steeped in an acid of some kind (organic preferable), dried, and then washed with a solution of nitrate of silver and again dried, is brought into contact with the object to be copied, and retained there for an indefinite time (from five minutes to nine hours, half an hour being considered enough). On subsequently exposing the sensitive paper to sunlight a negative impression is developed, which becomes fixed by thoroughly washing with plain water. The following appears to be an approved formula for preparing the paper:—Mix one ounce of glacial acetic acid with three ounces of water: in this steep the paper and hang it up to dry. Wash on both sides with solution of nitrate of silver sixty grains, water seven drachms, glacial acetic acid one drachm: dry.

It is expressly stated that it is *not* necessary that the writing, engraving, &c., to be copied should have been exposed to light, and that the prepared paper, after removal from contact with the original, may be kept for some days before development by sunshine if preserved between sheets of white paper.

Here is a wide field open for experiment. We should much like to know more about this interesting phenomenon, for it seems possible that a great assistance to the multiplication of copies in bad weather may be within our reach. Nothing appears to have been said in discussion about half-tone; in fact, for aught we are informed, the paper did not elicit any discussion at all. This was very likely owing to the next matter of stirring interest which was before the meeting—a strong protest by Mr. Heisch against the Report of the Collodion Committee, recently published by the Photographic Society; and Mr. Heisch's protest was subsequently unanimously adopted as expressing the opinion of the Blackheath Society.

With regard to the "Report" itself, we pointed out some of its failings in a previous number; but we think that Mr. Heisch has been scarcely just to Mr. Hardwich in his observations, as, although he does not expressly state as much, he seems to imply that Mr. Hardwich is commercially interested in the question. Now, in point of fact, this is not the case. Mr. Hardwich has no pecuniary interest in the matter; on the contrary, he has made a great sacrifice in entirely abandoning the manufacture of a very remunerative article, and by unreservedly publishing the result of his labour and experience for the general benefit of photographers, and this without fee or reward of any kind. We have the best authority for the correctness of this assertion.

There were so many subjects of discussion at the last meeting of the Photographic Society (London) that it was very difficult to get through them all, and was only accomplished by an unusually protracted sitting: in fact, there was matter enough for three ordinary meetings. The report of what took place will be found in the usual column, but we have a comment or two to make thereon.

During the discussion of the subject of "burning in" photographs upon glass, M. Joubert exhibited two specimens of his own production by a new process, for which we understood him to state that he proposed procuring a patent. Whatever may be the process employed, the result is certainly most beautiful. One specimen was the portrait of an elderly lady in a black dress and white cap, which displayed the most delicate gradation of tone between both extremes, and with exquisite softness and finish. Whether viewed as a transparency or with a background of white paper the effect is equally satisfactory.

On the discussion upon the panoramic lens the very general animosity displayed towards the inventor can only be accounted for by the injudicious manner in which he has not only sung its praises, but endeavoured also to pour contempt upon all who should not regard it with as favourable an eye as he does himself. It should be borne in mind, however, that there is one marked difference between the cases of the orthographic and the panoramic lenses: the former was originally introduced with plenty of laudation, but no description of its construction; while with the latter no concealment of the principle of construction was attempted, although it was accompanied by even more praise than its predecessor. It was remarked by one speaker that "this lens was a mere attempt to copy the human eye." If this expression were intended by way of detraction, we think it was very injudiciously chosen. We cannot regard such an attempt as objectionable. Although we consider the result as unsuccessful beyond a very limited extent, it is not a failure of which any one would need to feel ashamed; and we feel convinced that but for the absurd claims set up for qualities which it does not possess, more justice would have been done to those which it has, as well as to the ingenuity which we feel constrained to admit has been shown in its design.

SUGGESTIONS FOR A HELIOGRAPH.

By W. Hislop, F.R.A.S.

The near approach of the great solar eclipse of July, 1860, induces me to offer a few suggestions for the construction of a new heliograph for the purpose of obtaining photographic pictures of the sun's disc. The attention of astronomers has been for some time directed to the importance of obtaining accurate delineations of the Protean changes which take place upon the surface of our great luminary, in order, if possible, to ascertain the laws which govern them. At the present moment the subject acquires greater interest from the possibility that what has often been mistaken for a spot being nothing more nor less than a planet, new to science, and interior to all the rest. In the case of a solar eclipse, also, it is extremely desirable to obtain a record which shall be more trustworthy than the observations of individuals, who may differ in their visual powers, and in their mental ability to note correctly what they really see. Some important scientific questions depend for satisfactory solution on data which photography seems alone capable of obtaining with precision.

A large heliograph has already been constructed for the Kew Observatory, consisting in fact of a telescope with an aperture of six inches (if my memory serve me aright), and producing an image of the sun's disc about four inches in diameter. The quantity of light and the large aperture employed render it difficult to expose the plate a sufficiently short space of time, and recourse has been had to retarding the sensitiveness of the plates by various means well-known to photographers. It is proposed, about the time of the eclipse, to transport this instrument to Spain (across which country the path of totality passes in a diagonal direction), in order to register the phenomenon in its various phases. This heliograph in consequence of its size is cumbersome, and also expensive, and, as I have just observed, is nothing but a telescope with various adjuncts to adapt it to its particular work.

Want of time has hitherto prevented me from making more than a few preliminary experiments towards perfecting the instrument, the construction of which I now suggest.

I propose to take a view lens of about 26 inches focus, and of a diameter sufficient to ensure accuracy in the figure. This should be furnished, at the proper distance in front, with a series of stops

from say 1-16th of an inch to the larger size, at which the lens will work without sensible spherical aberration. These apertures should be so arranged as to be readily changed, and may be either holes pierced in a plate of brass sliding in front of the lens, or be arranged in a circular disc, turning on a centre, similar to the diaphragm of a microscope. The lens so fitted should be fixed at the end of a telescope tube of the proper length, and the image of the object, instead of being received upon a screen, or impressed upon a sensitised plate, should be received by another photographic lens, adjustible at the proper distance to magnify the image. The best lens for the latter object would probably be one on the orthographic principle, which construction would also increase the means of correction in combination with the front lens, so as to obtain the utmost amount of accuracy of picture.

In the rear of the back or enlarging lens should be the arrangement for holding the focussing screen and dark frame, which arrangement should be capable of moving backwards and forwards, so as to get a smaller or larger picture.

It would be convenient at times to impress more than one image upon a single plate. For this purpose, the dark frame should be of an oblong shape, similar to that of a stereoscopic camera. One picture having been impressed the proper time, could then be passed forward, and another part of the plate brought into position. For rapid work, such as would be necessary in registering an eclipse, the dark frames might be passed through the groove, and so made to succeed each other rapidly, being prepared by one assistant and received and developed by another. It is probable, however, that dry plates would be found most convenient when the observer has no assistant.

By the arrangement I have thus described, instead of retarding the sensitiveness of the plate by chemical means as is now done, we have the power mechanically of diminishing the light, and at the same time arriving at our results by a shorter path. Thus we may diminish the light and also spherical aberration by using a smaller stop, while, with the aperture remaining the same, we may enlarge the image at the point of impression, and so reduce the energy of the light by diffusion. At present the image obtained on the negative plate is afterwards enlarged by optical means, thus making two operations: by my proposed arrangement the image would be obtained of an increased size by one operation.

The exposure being comparatively instantaneous, no mechanism would be necessary for keeping the instrument moving with the sun; and, as an illustration of the rapidity of action, I may mention that with a lens of eighteen inches focus, producing an image of the sun's disc rather less than a quarter of an inch in diameter, and having a stop of one-sixteenth of an inch, it was difficult to expose for a sufficiently short time to avoid solarisation, even with an acid bath.

An instrument of this kind can only be constructed by those who undertand some little of astronomy, optics, and photography; and as many of your readers have the mechanical facilities for effecting the corrections required, I take the liberty of forwarding the above suggestions for insertion in your Journal.

ON PANORAMIC AND PLANE PERSPECTIVE.

By Thomas Sutton.

[Read at the Meeting of the London Photographic Society, 3rd April, 1860.]

In plane perspective, when a wide field of view is included, the objects at the sides of the picture appear misshapen and disproportionately large. They appear misshapen because the pyramids of visual rays of which the eye is the vertex are cut by a plane inclined to those rays at an angle of *great* obliquity; and they appear disproportionately large for a reason which will be explained by the following illustration:—

Suppose two men of equal height to be standing—one, which we will call A, opposite to the eye of a spectator—the other, B, at a distance greatly to the right, but the latter quite close to the plane of the picture, the former at a distance from it. Now, in this case, the man at B will be drawn life-size upon the picture, while the man at A will be drawn less than life-size; that is to say, the man who is farthest from the spectator will be represented as larger than the man who is nearest to him. This shows the absurdity of plane perspective when the field of view embraces a wide angle. The absurdity would not, however, be apparent if, when viewing the picture, the eye were confined strictly to the proper point of sight, and the side objects viewed very obliquely; but that is not the way in which pictures are looked at. In order to get distinct vision of the whole picture, the spectator takes a position about twice the breadth of the picture from it, and, in order to inspect more closely the separate points, he walks up to them, and brings the eye directly opposite to the part which he is examining. No one would ever dream of walking close up to the middle of a very wide picture, and looking at the ends of it obliquely from that station. It follows, therefore, that plane perspective will not do for views which contain a very wide angle. Even in correct drawings in plane perspective which include the moderate angle of 45°, there is something strange, unintelligible, and inartistic about the shape and size of the marginal objects.

It is evident, therefore, that if we wish to take a picture including a wide field of view, we must give up the idea of taking it upon a flat surface. If it were possible to construct a lens which should include a field of 120° upon a flat surface, the picture would be a hideous caricature.

The proper kind of perspective for a wide angle of view is panoramic perspective, and the proper surface for taking a panoramic picture upon is a vertical cylinder, with the eye at the centre.

But, in viewing a cylindrical panoramic picture from the centre, we can see only one part at a time. The eye is not a panoramic lens with a diaphragm in the centre, so that everything can be seen distinctly at once, but a lens with the diaphragm or pupil in front, and it only gives distinct vision of one object at a time. Watch any one reading a large folio volume of old and faded type: how his head moves from one end of a line to the other, and back again, so as to bring the eye opposite to each word in succession, in order that he may see it most distinctly! But it matters not whether, keeping the eye at the centre of the cylinder, we turn its axis round to the different parts of the picture in succession, or whether we flatten out the cylindrical picture, and view its separate parts, by giving the eye a motion of translation along it, so as to bring its axis opposite and perpendicular to the different objects in succession. It matters not whether we perform a pirouette upon our heel in the centre of one of Mr. Burford's panoramic views—or whether we spread the picture out flat, and view it while walking upon a stage parallel to it—or whether, while we stand still, a small portion of it at a time is brought into view by being unwound from one vertical cylinder and wound upon another. All these plans are right in principle, and involve no absurdity; because, in all panoramic pictures, the farther a thing is off the smaller it is represented, and the common sense of the spectator is not outraged or his wits puzzled by unintelligible freaks of perspective at the sides of the picture.

If a panoramic picture is spread out flat, and the eye placed at such a distance from it that the whole can be included at one glance, the spectator might be puzzled, did he not, by comparing the small height of the picture with its length, and the multiplicity of objects included in that length, become aware at once that it was not in ordinary plane perspective, and, consequently, not intended to be viewed in that way. Nevertheless, from the graceful axis of the vanishing lines, the long flowing lines of the composition, and the absence of all misshapen, distorted, and unintelligible representations of things, panoramic pictures flattened out are not only vastly more interesting than common views, but infinitely more artistic.

If a crescent of equal and similar houses were taken by a panoramic lens placed at the centre of the crescent, the picture when flattened out would be the same as if the houses had been placed in a straight row, and taken upon a flat picture parallel to them. One could not, therefore, tell how such a picture had been taken unless a description were appended to it. But this would not constitute a special objection to the panoramic picture, because it would cut both ways. Tell us what lens the picture was taken by and then we know all about it.

Towards the close of the Crimean war Mr. Robertson, of Constantinople, took from the same station three views of Sebastopol, so as to form, when mounted side by side, a sort of panoramic picture, including an angle of about 100°. Although it possessed extraordinary interest, one could not help regretting the defects occasioned by the joinings of the prints, which being better in definition and more strongly lighted in the centre than at the edges, the three patches of light and two dark joinings did not look well. But when the panoramic lens is employed, and the whole picture taken at once, the definition is equally good along the whole horizontal line, and the light equally distributed.

It is evident, from what has been said, that plane perspective is wrong in theory for pictures which include a wide angle, and panoramic or cylindrical perspective quite correct.

When the axes of all the pencils pass straight through the centre of a panoramic lens without suffering deviation, the image upon the cylinder is geometrically correct, and absolutely free from distortion.

ON PHOTOGRAPHIC PRINTING UPON PAPER.

By W. T. Mabley.

[Read at the Meeting of the Manchester Photographic Society, April 4, 1860.]

In the early days of photography—indeed until very recently—printing from a negative was considered to require but very little care or experience; it was looked upon as one of those things that anybody could do, and men of science thought it beneath their investigation. The fading of prints, however, aroused them from this dream, and in endeavouring to overcome that evil, results have been arrived at which give us, so far as we can at present judge, the thing we sought, and, in addition to that, an artistic effect which was not contemplated. If now, therefore, it should happen that we have the means of producing permanent prints, their having faded has been a most fortunate occurrence, and we must look upon it as having been a blessing in disguise; for who is now satisfied with that dirty yellow which so often disfigures a print fixed and toned after the old method? But although printing has now received considerable attention, it has appeared to me that several matters which might or might not be of importance have never been practically and sytematically examined. The condition of the nitrate bath, for instance, which, as we all know, can in negative photography affect the results immensely, might, it appeared, be also of great importance in printing upon paper, not only in reference to sensitiveness, but in imparting facilities for pleasing and economical effects in tone. On taking up this subject I determined, therefore, to examine separately the several divisions, and to determine, if possible, what might and what might not be done, and to establish, if possible, the conditions necessary for producing the best results.

Before I give you the results of my experiments, I think it necessary to explain the method I adopted in conducting them. I wish particularly to do this, because there is, as we all know, a great disposition among photographers to jump at hasty conclusions, and to enunciate as facts things that rest upon very slight investigation. This conduct cannot, I think, be too highly censured; it brings discredit upon the art, and wastes the time and money of those who have not yet learned, from bitter experience, how little dependence is to be placed upon the so-called facts which are lavishly given to the world. I say this, feeling that I myself may be found wanting in some things; but I shall, at any rate, place before you results which you can see, together with a minute account of the means that were adopted for producing them; and you will therefore be in a position to judge of the value which may be placed upon my statements.

Many of the examples of which I shall have to speak are founded upon comparative experiments, and these could not have been properly carried out by negatives I had by me; because it would have been impossible to select, even out of a large number, three or four which would produce the same character of print, or require the same exposure. I therefore determined to make negatives for the purpose, with regular gradations of light and shade over the entire surface; and the method, after several trials, which I found to answer best, was to cause the light to pass through strips of paper of different degrees of transparency. Having obtained a negative in this way, I could, by placing separate pieces of paper, prepared in different ways, upon it, obtain as many pictures by simultaneous exposure, each one being acted upon by exactly the same amount of light, and representing the same gradations of light and shade. The results of the experiments so conducted I will now lay before you; but they must be considered only as a commencement made, and as hints which point out the direction in which future examinations must be carried on.

So much more time has been required than I expected or than I could spare from my own profession, and I have been so perplexed by uncertain weather, that I must omit much I had intended to have included in the present paper.

The first thing to which I directed my attention was the sensitiveness of prepared papers as affected by various conditions of the nitrate bath. There has been a general idea that this bath must be strong, but of what particular strength it should be it has been uncertain; it has also, so far as I know, been doubtful whether it should be acid or alkaline, or whether impurities arising from a mixture of organic matters, or other such substances, affected it. In reference to the strength of the bath, it is well known that it must depend upon the quantity of salt employed in the first preparation. Chloride of silver will darken with a small excess of free nitrate, but it requires a considerable excess to afford a brilliant picture. The chemical action which gives rise to the substance constituting the picture is a matter of dispute with the learned; but it appears to me that the most reasonable explanation which has been given is, that the layer of chloride of silver becomes decomposed, giving off chlorine, which unites with a quantity of the free nitrate, so as to form another film of chloride, and so on. But whatever the chemistry may be, it is certain that a considerable excess of free nitrate is required: and here our first difficulty comes upon us, for we buy our albumenised paper, and are in total ignorance as to the quantity of salt used in the albumen. It should be remarked, too, that the equivalents of the salts used vary: between that of ammonium and sodium the difference is not very great, ten of the former being equal to eleven of the latter, but it requires twice as much chloride of barium. It is therefore greatly to be desired that makers of albumenised papers would stamp each sheet with the name of the salt used, and with the number of grains to each ounce of albumen.

The paper I employed for the purpose of my experiments was salted with ten grains of chloride of ammonium to the ounce of albumen, unless otherwise mentioned, and I adopted a sixty-grain nitrate bath as the standard by which to compare others. All the baths I shall mention were made for the purpose from crystallised nitrate of silver. The standard bath of sixty grains gave, as is usual, a faint acid reaction to test paper, so that there was a small quantity of free nitric acid present.

The various pieces of paper were floated on the baths for exactly the same time, viz., six minutes, and were dried in a warm room without being held near to the fire, and, for the present purpose, that is the comparison of sensitiveness. The prints were fixed, without toning, in fresh hyposulphite of soda, in which they remained exactly the same time, and were then quickly washed. I adopted this plan because the action of toning might in some cases have masked the degree of sensitiveness. The first trial was a comparison of paper prepared with a sixty-grain and ninety-grain nitrate bath. Here is the result, two samples being given, and I think you will hardly be able to detect any difference: there is, perhaps, a slightly increased bronzing of the darkest shade due to the ninety-grain bath—it is, however, but slight. The next trial was a comparison with a bath which, with additions at times of nitrate of silver, has been in use for about two years, there having been at times old negative baths added to it, so that it must contain a considerable quantity of substances which were not intended to be there, not only from that source, but from the chlorides with which the papers were salted, and from gelatine and other matters used in sizing by the maker, and in preparing papers for plain printing; but on examining the prints you will scarcely perceive any difference as regards the sensitiveness of the paper. The next bath employed was neutralised, and a further quantity of alkali added so as to give it a faint alkaline reaction to test paper: here is the result, and you will perceive again that there is not any difference of consequence in the sensitiveness. Here are examples of a comparison between the standard bath and another in which were two drops of nitric acid to the ounce, and still the sensitiveness remains nearly the same; the standard bath has, however, the advantage slightly. The next experiment was with paper floated for different lengths of time—one being allowed to remain in the bath for half an hour, and the other for the standard time of six minutes. Here is the result, and the sensitiveness is still unaffected: here are two prints, the one being on paper prepared with ten grains of chloride of ammonium to the ounce of albumen, and the other on paper prepared with fifteen grains to the ounce, both floated on a nitrate bath of ninety grains to the ounce: here is a most marked difference—it is not preceived so much in the lighter shades, but in the darker the paper prepared with fifteen grains of chloride is much more bronzed, and the whole tone of the print is more intense.

Now looking at sensitiveness alone it does not appear from the foregoing experiments that the condition of the nitrate bath is of that importance which might have been imagined; but it does appear that the quantity of chloride of silver formed upon the paper influences the sensitiveness considerably; and the general aspect of the print would give promise of an exalted toning quality. But the consideration of that is left for the next division; at present I merely refer to sensitising.

It must be left for future trials to determine the most suitable strength of nitrate bath for paper salted in this manner; but taking it at ninety grains it certainly gives results superior to ten grains salted paper floated upon the same bath.

There is another matter connected with sensitiveness which I am enabled to illustrate in a striking manner. Mr. Pyne has favoured me with a piece of paper, which has been kept sensitised for six months in one of Messrs. Marion's cases. On removing it yesterday

I found it but very slightly discoloured, not so much so as paper frequently becomes by being kept in a room for twenty-four hours. I expected, however, to find that its sensitiveness was materially weakened; but, to my astonishment, on printing upon it, together with another piece freshly prepared and from the same negative, I found it to be more sensitive. This, however, must not be taken as an experiment which shows that paper improves by keeping; for it must be borne in mind that I was unacquainted with the mode in which it was prepared, and that some makes of paper are more sensitive than others. I think, however, that taking it as an average sample, we may fairly assume that positive paper does not suffer in sensitiveness by long keeping. I received another piece of this paper for my inspection, and a third I printed upon for toning, the result of which I shall presently show you.

There is one more matter connected with sensitiveness which I have experimented upon: it is the quantity of light obstructed by the thick glass used in printing frames. Here is a print from a negative covered with the usual thick glass, and here is another printed without that covering. The two negatives are cut out of the middle of a large plate, after a negative of that size was taken to secure the same printing qualities, and the two pieces of paper were cut from the same sheet after it was sensitised.

You will perceive that the difference in the prints is very great, printed even as they were in bright sunshine: on a dull day we should, I expect, find a far greater contrast.

It is difficult to estimate the extra printing which the thick glass renders necessary, because the light may not continue the same while the last is being finished; but I believe, from observations I have made, that in dull weather the difference would amount to twenty or thirty per cent. It will be obvious that, when many copies from a negative are wanted, this is an important matter, and when that is not the case it is still of advantage to the amateur, who has but few hours to devote to photography.

(To be concluded in our next.)

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 2.

The art of commenting upon the sayings and doings of others is not a secret in the possession of one person only, but is understood more or less by us all. Of this the author of these letters has lately experienced a proof; for, whilst he was examining, in a critical manner, the statements and analyses of our friends on the other side of the channel, the same process was, without his consent, being applied to himself much nearer home. The proceedings which took place at the last meeting of the Blackheath Photographic Society have been fully reported in the journals, and the reading portion of the photographic public are doubtless familiar with them. Mr Heisch is the exponent of the views of that society, and it is certain that he has stated everything which was necessary to make a strong case.

The writer of this letter declined, in the first instance, becoming a member of the Collodion Committee; but, inasmuch as his interests were not likely to be affected by the Report in the way which Mr. Heisch supposes, there appeared no impropriety in his attending the meetings of the committee from time to time, and even in his being present when the Report was agreed upon: thus he understands the opinions and experiments of the committee, and is in a position to reply to the arguments of Mr. Heisch.

An impartial observer, taking a cursory glance at the proceedings of the Blackheath Society, would perhaps be struck with the observations of the speakers, and wonder equally with them how a number of gentlemen could commence their Report by stating the defects of a collodion, and end it by recommending the society to adopt that formula. The difficulty, however, ceases when it has been explained that the committee found other collodions which they had used previously, and were using simultaneously, to be in the same predicament. Like optical lenses, collodion seems to lose in one direction what it gains in another; and, therefore, all that can be done is to reduce the errors to a minimum, and to select that formula which appears to offer the most advantages. Consider, also, the difficulty of comparing collodions with each other in so complete a manner as to satisfy all. It has been said, "Try them under similar circumstances, and the result will be conclusive!" but this inference is an unfounded one, as may be proved by the experiments of the Collodion Committee themselves; for, whereas one member states that he tried another collodion, and found it to give the picture in one-half of the time, a second member says that he also tried that same collodion, and proved it to be inferior in sensitiveness to the collodion supplied to the committee. It is probable that there were differences of manipulation not taken into account, or that one collodion was more prone to drying and consequent loss of sensitiveness than the other. Neither does it appear impossible that the constitution of the developer may have influenced the result, for there exists a state of film in which, after passing through the bath, nitric acid is present, due to traces of iodine in the collodion; and when such is the case, it is presumed that the same quantity of acid cannot be tolerated in the developer. In another sample of collodion intended for comparison with the first, the reaction of the iodide of silver, on leaving the bath, may be alkaline, perhaps from a minute quantity of ammonia left after washing the pyroxyline, and, if so, a stronger acid in the reducing agent would restore the balance. These ideas are not merely theoretical, but strictly practical as well; for who has not noticed, when using a colourless collodion free from iodine, that, in a strong light, the image develops with great rapidity and detail, but that there is over-action in the sky. On looking at the plate, the photographer exclaims at once—"The collodion is alkaline; I shall get a better picture by adding citric acid to the developer, or by dropping tincture of iodine into the collodion itself until it becomes yellow!" This question, indeed, appeared so interesting, that the author of these letters, on seeing Mr. Morgan's report, in which he complained of a want of sensitiveness, was induced to write to him at once, and inquire whether there could have been any mistake. He received, however, a reply, saying that the facts were certainly such as had been stated, and that there was no mistake. In another part of his letter Mr. Morgan went on to describe what he considered as the characteristics of the committee collodion, and spoke of it as a good and useful preparation, not sensitive, but producing clean and well-defined pictures, the image sometimes rather intense than otherwise, but with no tendency at all to solarisation, even after a long exposure. The other member of the committee, whose evidence on this particular point was opposed to that of Mr. Morgan, spoke of the sensitiveness as something quite remarkable, but the image a trifle too weak, and with a little tendency to fogging, unless the collodion had been kept for a time in the iodised state. Now, all those who know Mr. Morgan, and also Mr. Hughes (for it is better to mention his name), will have confidence that the facts were such as they have described. How, then, did it happen that four pints of collodion, taken from the same bottle, gave such different results? The cause may perhaps have been due to a more acid condition of the film during development in the one case, and a less acid state in the other. Mr. Morgan praises the collodion for not solarising; but in my own practice I have been sometimes annoyed with solarisation, and, when the light has been very strong, have worked more to my satisfaction, either with collodion made from a softer quality of pyroxyline, or with the same collodion, after the addition of a bromide. An addition of citric acid to the developer, however, remedies the defect of over-action of light, although it renders necessary a longer exposure in the camera.

ON A NEW DRY COLLODION PROCESS,

Being the substance of a Paper read at the Chorlton Photographic Society, April 11, 1860.

By William Griffiths.

I shall make no apology for introducing to your notice this evening a subject in which I presume all of us are more or less interested, namely, that of a good yet simple dry collodion process.

I should probably have displayed more prudence if I had delayed calling your attention to it until I could have spoken of it with the confidence of an operator who had worked it successfully for a whole season. But although I have not as yet tried more than a dozen plates, I am certain from their behaviour, as well as for the chemical reasons which first led me to try it, that it is destined to become no mean rival of the Fothergill or even the collodio-albumen process. Those of you who are invariably successful with the two last-named processes will not be easily persuaded to give them up whilst that success continues; but those who are not so fortunate (and I am persuaded there are many) will do well to give a fair trial at least to the method I will now lay before you.

The great elements of success in any dry collodion process are, in my opinion, the employment of perfectly clean plates, non-contractile, or what is generally termed powdery, collodion, and thoroughly washing after the sensitising bath.

There is no necessity for my troubling you with any lengthened

description of the manipulation required, as it is neither more nor less, up to a certain point, than that of the ordinary wet process.

Take care the plates are as nearly as possible chemically clean, and perfectly dry previous to coating them with collodion. This latter should be of the kind before mentioned; but if any difficulty be experienced in obtaining it, any other will do, though perhaps not quite so well, if the precaution is taken of running a camel-hair brush, dipped in spirit varnish, all round the edge of the plate previous to developing it, otherwise the film will most likely split up when it comes to be dried.

With contractile collodion this is sure to occur when this latter precaution is not taken. Let the film set well before immersing the plate in the nitrate bath, and when the sensitising process is complete put it into a dish of clean filtered water, which should be changed several times. I prefer a wooden trough, inclined at an angle, and so arranged that a gentle stream of water flows in at the upper part over the plate or plates, and out at the lower. While this washing is going on, you of course proceed with the preparation of other plates; and when you have, say half a dozen, in the wash dish or trough, you take out the first one put in, drain for about a minute on blotting paper, then pour over it, as you would do albumen in the Fothergill process, ordinary fresh milk—if after the cream has been taken from it all the better, so that it is perfectly free from acidity. Let it remain on for about a minute, then wash it well off under a gentle stream of water or in the washing bath; drain on blotting paper, and let it dry spontaneously; or, what is still better and more convenient, put the plates when well drained into an air and light-tight box, in which is a saucer, or other convenient vessel, containing an ounce or two of chloride of calcium. By this means the plates are more effectually dried, and are at the same time preserved from the noxious vapours generally floating in the atmosphere of the dark room.

The exposure required, as far as I can judge from the limited experience I have had of them, is about the same as the two processes before named.

The development is the same as in the Fothergill process, but is if anything more rapid. An extremely small quantity of silver is required, say three or four drops of a thirty-grain solution for a stereoscopic plate.

There does not appear to be the slightest tendency to stains or fogging during development, if perfect cleanliness is observed; and in this respect it has a great advantage over the other two processes.

I prefer fixing with a weak solution of cyanide of potassium.

The keeping properties of the plates can only be determined by experience; but I do not see any reason why that should not be equal, and even superior, looking at it from a chemical point of view, to that of the others.

All processes in which albumen forms a constituent of the sensitive surface are of necessity slowly acted on by actinic influence, besides being extremely liable to a species of spontaneous decomposition when kept for any length of time, especially at that season of the year when their services are more particularly required.

The action of the milk on the sensitive surface I conceive to be this:—The phosphates and chlorides which it contains, on coming in contact with the minute portion of free nitrate of silver which is retained mechanically by the particles of iodide in the film, however much it is washed, becomes converted into phosphate and chloride of silver; at the same time a small portion of casein, rendered insoluble, is precipitated in the pores of the film.

I am not sure also whether the sugar of milk is not retained to a small extent, and is useful in accelerating the development.

On some future occasion, after a more lengthened investigation and experience, I may perhaps be allowed to enter more fully into what I believe to be the chemistry of the subject, as well as that of the dry processes generally.

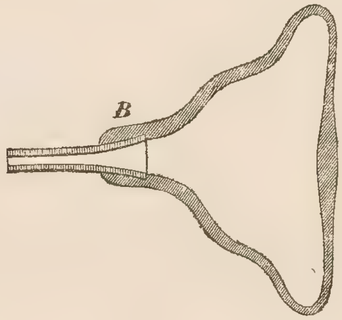
ON VARIOUS KINDS OF GLASS, WITH REFERENCE TO THEIR APPLICATION TO PHOTOGRAPHIC PURPOSES.

By J. A. Forrest.

(Continued from page 64.)

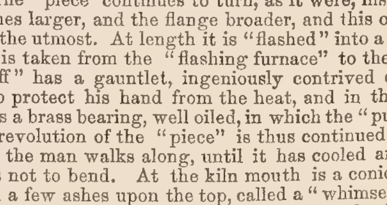
Having secured the pear shape and proportionate thickness, the "blower" re-heats it in the "Patteson hole," and on withdrawing it, it is blown out so as to still further enlarge the widest part. The pipe is supported on an iron "stake" with a broad notch at the top, and the point is pressed into a recess at the end of an iron rod, called the "bullion socket," and held by a lad in a low iron fork. The bullion socket cools and prevents the expansion of the little button at the end, and it also supports the end or "bottom" of the "piece" against the breadth, allowing the workman to complete the top or "shoulder" without making the "bottom" too thin. From the "bullion socket" the blower proceeds to the "bottoming hole"—a furnace similar to the Patteson hole, but of much larger dimensions. The piece is twice reheated in this furnace, and blown out each time, eventually taking the shape of a globe thinner at one pole than the other. A third heat is now taken, and the pipe being turned out rapidly, a well known result ensues—the globe is enlarged at the equator and flattened at the thin soft pole, and being immediately taken from the furnace, it has the shape of *Fig* 1. It is laid across a box containing soft ashes, and an iron rod or "punty" having been heated at the end, and the point dipped into some "glass," it is brought by an attendant and stuck

FIG. 1.



to the bullion at A, the hot metal and "piece" firmly uniting. A short iron rod dipped in water is applied to the neck at B, and causes various small cracks: a blow on the pipe with the wooden mallet breaks the "neck" at that spot, and separates the "piece" from the pipe, leaving an opening about two-and-a-half inches in diameter. The blower marks his number with chalk near the bullion—each man being paid for the number of good tables he makes—and his work upon the "piece" is ended. The "punty sticker" lifts it up by the "punty" and carries it to the "nose hole," a very small but intensely heated reverberatory furnace, with a small circular aperture. Here the "neck" broken from the pipe, and comparatively cold, is reheated, and then rolled upon a board to round off its sharp edges, and the "piece" is delivered to the "piece opener" at the "flashing furnace"—another reverberatory furnace of very large dimensions, very hot, and full of flaming fuel, with a large circular aperture at the side, through which the whole piece is reheated. It is now turned round more rapidly, the first effect of the centrifugal force thus acquired being to flatten the other pole of the former globe. The rotation being continued and increased, and the glass more softened by the heat, the hole expands, and at length turns outwards as in *Fig* 2. The turning

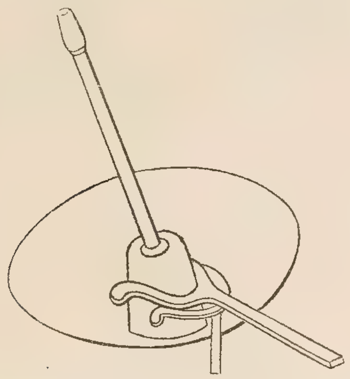
FIG. 2.



is now carefully managed and maintained, for the glass is nearly melting. The "piece" continues to turn, as it were, inside out; the hole becomes larger, and the flange broader, and this opening continuing to the utmost. At length it is "flashed" into a flat circular plate, and is taken from the "flashing furnace" to the kiln. The "carrier off" has a gauntlet, ingeniously contrived of sheet tin and felt, to protect his hand from the heat, and in the hollow or bend of it is a brass bearing, well oiled, in which the "punty" freely runs: the revolution of the "piece" is thus continued by its own impetus as the man walks along, until it has cooled and stiffened so much as not to bend. At the kiln mouth is a conical block of wood, with a few ashes upon the top, called a "whimsey." As the "carrier off" comes with the finished piece towards the kiln, the assistant, or "sister," as he is sometimes called, lays a large two-pronged fork or "horns" across the "whimsey." The "carrier off"

then rests the "bullion" upon it, the table being nearly horizontal, as in *Fig* 3; and the kilnman detaches the "punty" with a pair of

FIG. 3.



shears. The assistant immediately lifts up the "horns" with the "table" resting flat upon them, and passes them through a long narrow opening into the kiln, where it is reared and "piled" up upon its edge by the kilnman. There are two "piles" in the kiln, and the tables are "piled" alternately to each. The first rest against the back wall of the kiln; but after about twenty or thirty are together, a "drosser" is put up. This implement consists of an iron frame, with a projection at right angles from one end. It is reared up near the glass, but not touching it, and the projection passes over the top of the tables and rests against the wall. After another score or so of tables have been "piled," a fresh "drosser" is reared up, the projection also passing over the top of the "table" and resting against the first "drosser," and so on until the "pile" is completed and divided into five or six sections. Any accident happening between two "drossers" is confined to that division of the "pile," and further mischief is prevented. The kiln holds about 350 to 400 tables each.

The glass is allowed forty-eight to sixty hours for annealing: it is then taken from the kiln and cut in two, by a straight line, a few inches from the "bullion." The "half-tables" are either packed in crates for sale, or cut into squares to order; in either case the article itself, and the use of diamonds, are too well known to need comment.

In the process of annealing, crown glass acquires a slight bend, which unfits it for covering prints and photographs; this difficulty is overcome by taking the "small half" (without the "bullion") and placing it upon a perfectly flat stone in the kiln, and whenever it is seen to fall flat, the fire is removed, and it is allowed to re-anneal.

In the course of manufacture, should the coals be impregnated with sulphur, it will give to the glass a milky appearance, and if the photograph is taken upon that side it is sure to result in a foggy picture. The process of polishing lessens this liability, but not always. There is another difficulty in crown glass, arising from dust affixing itself to the outer surface while the piece is at the "nose hole:" this gives roughness to the surface, which the photographer can easily detect by passing the back of his hand over the plate before collodionising. Crown glass of the usual thickness is unsuited for photographic purposes, beyond the whole plate (8½ by 6½).

(To be continued.)

OUR PHOTOGRAPHIC PIC-NIC, AND HOW WE FARED.

It was arranged to take place in the holiday season just departed to the tomb of its predecessors. The ladies—bless 'em—said it was too early in the season, and their pretty lips pouted at the idea of *photography* in connection with a *pic-nic;* but the gentlemen, like bears, only prepared their dry plates or their dark tents, and discoursed learnedly upon the subject of processes and apparatus the while; and so the fair creatures gave their graceful shoulders the usual shrug of Christian-like resignation; and while pitying the bad taste that could prefer the glare of a photographic lens to the blink of their bonny eyes, determined to show the conceited creatures who fancied themselves so indispensable to make the day pass pleasantly to their fair companions, that the latter could do uncommonly well without them, and, with a merry peal of laughter, the affair was at once definitely settled.

Of course the usual knotty points—the relative advantages of pies, tarts, poultry, joints, &c.—were duly discussed, and finally disposed of.

There came a wet day, and one fair young creature, filled with the spirit of prophecy, said "it [the day in question] was *sure* to be wet." Then came a fine day, and "hope told a flattering tale," while fear was still whispering to the anxious ear, not all unheeded, for April weather was "*so* changeable."

The morn of Friday came — bedrooms were ominously dark. Those eager pleasure-seekers who peeped out saw a sky of whitish drab, gloomily monotonous in its appearance, like some photographs we have seen—a small mist-like rain falling cheerlessly upon the few passengers and vehicles, and not a glimpse of sunlight anywhere.

All met at the appointed place of starting. "How unlucky!" said one. "*I* think it will be fine now!" cried a more hopeful son of the camera. "So do I," echoed another. But the fair prophet looked at the rain, and in a tone of regret, mingled perhaps with some *slight* feeling of pride in the versification of her words, said solemnly, "I told you so;—see what comes of neglect of us!"

We started. A patch of white light stole above the horizon, but our Jehu still expressed foreboding fears. The patch of white light strengthened, widened, lengthened. Into the centre of that pallid patch in the drab-coloured sky came gradually a circular patch more decidedly white: it was—it *was*—THE SUN!

As we travelled on the day brightened gloriously. Shoreditch—with its placarded minor theatres, its costermongers, children of "the peoplesh," penny-show-like photographic *emporiums*, and its varied odours—we left behind. The quietude of Hackney stole upon us, and in its turn gave place to scenes more rural; and soon "the forest" was reached.

We halted, then started off in search of the picturesque, and had not far to go. There were trees with curved and twisted branches, spreading out fantastically. Before was a large pond, with weeds and rushes upon its rippling surface. The long and prickly brambles twisted and twined and drooped about the seemingly dry and withered bushes. Foliage was certainly scarce enough, but the utmost variety of form and texture luxuriously abounded; and *pictures* were seen at every turn of the head, which were as worthy photographing as any the brighter summer or more gorgeous autumn could boast—perhaps more so.

We brought the ladies to the spot, unpacked our apparatus, pitched our tents (dark ones of course), and soon our three-legged, large, cyclopean round-eyed artists reared their bodiless shapes upon the charmingly uneven ground, and to work we went. In a short time numerous plates, both wet and dry, were exposed; of the dry ones nothing can yet be said, but the wet ones all turned out very excellent negatives, as the members of the South London Society will acknowledge, when prints from the same are produced at its next meeting.

We had with us amateur and professional photographers and artists; and when selecting our views or exposing the plates, we did not scruple to throw our individual opinions or experience into a heap, for any member of our little community to pick therefrom as much as he chose or needed. Jokes and fun abounded, although work progressed none the less steadily, until hunger brought both to a pause, and then the hampers were unpacked; and somebody (when taking out the crockery) rashly said something about exposing his plates, and, such is the force of a bad example, somebody else made a joke (?) about their being "dry plates;" while another (desperate offender!) ventured to suggest "coating our plates," and the dry process being a precursor to the wet process; while another culprit asked if champagne were a good *exciting* fluid? and then such a terrible shower of photographic puns fell upon the original offender, that I do think he must be in the agonies of repentance at this very hour.

Occasionally we discovered ourselves to be objects of interest to rustic natives, and some impertinent frogs, and to one timid little dog, the property of a "tired wayfarer;" but no intruders were at all offensive in their remarks or actions, and the meal came to a conclusion amid expressions of general satisfaction. Then we photographed the groups around our dinner cloth, and a charming little picture it has made; then we had more fun, and then we took more pictures. Nothing happened to mar our enjoyment, although we had one negative spoiled by a too—too curious rustic, who went up to a deserted camera in which a plate was undergoing exposure, and, peering in through the lenses, was not discovered until he exclaimed to his companions, in a tone of unqualified delight, "I sees

my hi;" and although one portable camera-stand would obstinately insist upon collapsing at the wrong time, and would not, without much coaxing, condescend to stand firmly; and although one lady of the party did, in her confusion, cross before the just opened lens of the horrified operator, in the fond idea that she was taking precisely the direction he was pointing out instead of that exactly opposite. We duly adjourned for tea, and counted our gains, gloated over our spoils, and reached home after one of the pleasantest day's excursions we have ever known,—the parting wish expressed by all being, "many happy returns of the day!"

Now, this remark (quite applicable, for it is hoped that this will be the birthday of a series of such excursions in connexion with the South London Society) has induced me to pen this brief description of our very pleasant photographic pic-nic, in the hope that I may earn the thanks of many of your readers by pointing out the possibility of so charmingly blending pleasure with purpose.

A. H. W.

[We have a strong suspicion that this is not the first time that cameras have been turned to account to cover a quiet flirtation or two.—Ed.]

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

(Continued from page 83.)

These observations lead to important results in their application to practical photography, as they point out the cause of the sulphurisation of the proofs. When we take a fresh solution of hypo and wash a print in it, it dissolves a certain quantity of the double hyposulphite of soda and silver; a fresh proof immersed, a fresh quantity of this salt is dissolved; and so on, until the point of saturation (with the double salt) is soon reached, which point is very rapidly attained when we use a solution of ten per cent. From this moment the bath will continue to fix, but being supersaturated with double salt it begins to decompose. If another proof charged with chloride or nitrate is immersed in the hypo, these will act as soluble salts, and will now exercise a slow but sure action on the dissolved double salt. The double salt will be deposited both in the bath and in the paper, then hyposulphite of silver, and finally sulphide of silver and sulphur. The hypo bath will still *fix*, and will do so even until all the sulphur of the hyposulphite has been converted into sulphide of silver; but from the moment it is saturated with the double salt it will produce, both in the bath and on the print, a deposit of sulphurised substances, which will inevitably lead to fading in the proof.

Therefore, without in any way prejudging the practical conditions of the fixing, which will form the subject of a special article, we may say now that the proof, on removal from the pressure-frame, ought, in the first place, to be washed in water, which, removing the free nitrate of silver that would otherwise go into the hypo bath, will thus economise it; also, that the washing of the print in salted water, to convert the nitrate into chloride, is superfluous, because it does not at all diminish the quantity of silver brought in contact with the hypo, and consequently does not delay its saturation; lastly, that the hypo bath ought not to be employed for more than a very limited number of proofs, the number of which will be determined by the strength of the bath, and consequent on the energy of its solvent action on the double salt. We shall recur to this subject when we lay down the practical conditions of a good fixing bath, merely remarking now that, according to our experiments, the double hyposulphite of soda and silver acquires great stability in presence of certain salts, such as nitrate of potash, common salt, &c., which justifies the practice recently proposed of saturating the hypo bath with chloride of sodium.

The second cause of the alteration of the fixing bath, and, as a consequence, of the proofs immersed in it, is due to the addition of certain acids to the bath—acetic acid, for instance. This practice, which was introduced some years ago, is very generally abandoned at present, and therefore calls for no special remark. A fixing bath so prepared according to the reaction—

$$\times\ (d)\quad C_4H_4O_4 + S_2O_2\,NaO = C_4H_3O_3\,NaO + SO_2 + HO + S,$$

necessarily causes a deposit of sulphur on the proofs. This deposit, which forms somewhat slowly, is more or less considerable, according to the quantity of acid added, and the simultaneous presence of sulphur and silver on the print necessarily leads to its fading sooner or later,—therefore this method ought on no account to be followed.

After examining whether the various fixing agents employed in photography left any substance in the proofs capable of influencing their permanence, we next proceeded to examine what action these same fixing agents exercise upon the coloured portions.

In a study of this nature a mere comparison between proofs of various hues is not sufficient; the appreciation is, in fact, too difficult, and rests upon differences too delicate to seize upon. Yet, in simply employing this mode of investigation, we observe certain facts which may furnish some clue.

For instance, we know that by leaving a proof in a strong solution of cyanide of potassium it disappears entirely, in consequence of the whole of the coloured portion being dissolved by the fixing agent. On the other hand, when a proof is immersed in solution of ammonia, we perceive, after it is fixed, that it increases rather than diminishes in intensity; and even if left a long time in contact with this fixing agent, we perceive the *whites* become very palpably tinted. Lastly, if the fixing agent employed be hyposulphite of soda, no apparent change is visible under ordinary circumstances. But these are only uncertain indications, and to throw light on this important question it must be studied from another point of view.

(To be continued.)

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

American Subjects.

E. Anthony, Broadway, New York.

We have been favoured with three specimens of much interest, but of unequal merit. Firstly, there is the Horse Shoe Fall of Niagara: this, though a subject of unparalleled grandeur, is not executed with anything like the skill evinced by Mr. Wilson, of Aberdeen, in the correct illustration of falling water, which in the specimen under consideration looks far too solid. Secondly and thirdly, we have Broadway from Stewart's, Looking South, and Broadway from the American Museum, Looking North. These are two instantaneous views, and here our Scotch friend is certainly distanced. They are bright, clear, and sharp as a needle: even the figures in the immediate foreground, though evidently in active motion, are not blurred in the slightest degree. Both of these specimens are admirable, but the last-named is truly a wonderful production, and no less pleasing than surprising. Hundreds of passengers in every variety of attitude are seen traversing the extensive thoroughfare, with numerous omnibuses, cabs, and other vehicles, in the full blaze of a cloudless sun: the very gait of the pedestrians is distinguishable, and were the individuals depicted personally known to the observer, we have little doubt that they would be perfectly recognisable in the photograph. The whole of the street on the sunny side is lined with sun blinds over the shops, and on the right hand a grove of leafless trees adds to the effect, both by contrast and by the pleasing chequered light caused by the shadows of the branches. This is not a "bit of a picture," but a nearly perfect living reality. Few persons with this slide before them could resist the temptation to purchase, and we feel pretty safe in predicting an extensive demand for it.

NOTES OF A PHOTOGRAPHIC TOUR IN THE HOLY LAND.

No. XV.

We left Nazareth on Thursday morning. Our invalid had revived so much during the early part of the week that it became practicable to effect the removal she so much desired, and we arranged it as well as the rude means at our command would permit. We had to convey an invalid lady about twenty miles across a country in which roads are unknown, and a wheeled vehicle has not been seen since the days of the chariots of Herod.

The conveyance we contrived was a camel litter; but, as we had no camel, we placed it between a couple of donkeys. They are small and hardy, but have an easy gait; and their little feet scarcely rising two inches from the ground, made no jar of the vehicle, but it went even more smoothly than a railway carriage.

We formed a mournful procession too — all on horseback except our invalid. I say *our*. Alas! she is ours now; she belongs to all of us, as all the sainted dead belong to us — dust of our dust, and sharers of our immortality. We rode slowly across the valley, followed by the dark and tender eyes of the Nazareth women, who had learned to love the beautiful Christian girl from far lands, as they had often gazed in on her white face as she lay with the tent curtain thrown back.

Over the wild rocky hills east of Nazareth, covered with a growth of genuine oak, apparently a fine variety of timber, though not large—through wastes on which lilies grow in splendid profusion, down by the western base of Tabor, which is in fact a spur of the last decline of Lebanon, rising into a segment of a circle on

the plain of Esdraelon—then slowly crossing the magnificent upland plain of Galilee, where once the fields of corn grew luxuriant, in which the disciples of the Lord made their Sabbath morning meal, we advanced slowly till sunset, resting frequently. Once a large party of Bedouins met us, but passed on respectfully and in silence when they learned our sad burden. So the evening came upon us, and with it that view which blesses human eyes as no other view of all the scenes this side heaven can bless. The sea of Galilee lay before us, in calm and glorious beauty, far down in its basin of emerald hills.

That night we slept in peace, for the voice of Him who spoke peace to those waters was still sounding over them. Believe me, there is no spot on earth where that voice lingers with such sublime calm as here. All things remember it. The skies re-echo it; the murmur of the waves repeats it; the crumbling walls of old Tiberias seem to hear it. And when the stars are on the sea, and the voice of the winds is hushed, and the low murmur of the ripple forever whispering "Peace! peace!" is the only earthly sound on land or in the air. At such a moment, I say, believe me, there is no other spot of earth so near heaven; no place so fit to die in—so fit to go from into the green fields of the upper country—to pass over to the banks of the still waters.

On Saturday night our invalid began to fail rapidly. None of us slept. It was a warm night—not hot; but a delicious air stole over the sea. The tent door was thrown open, and the side curtains turned back, so that the entire eastern side of her tent was open to the sea. The water of the lake rippled within twenty feet of the canvas, and the old moon, some days past the full, rose at midnight over the hills of Bethulia, shedding a new lustre on the surface of the sea.

To stand on the shores of Genesareth and see one like her depart from the land of His weary footprints into the land of His glory; to witness the accomplishment of the blessing on the pure in heart, uttered by His lips on one of those hill sides, as we saw one of the pure go forth to see God; to see an angel winning at last her wings of light—a seraph gaining at last the perfect tones of the songs of seraphim; to hear again, in tones of melody hitherto but imagined, the voice that sounded of old on the sea of Galilee, "Come unto me and I will give you rest;" to see the sea of life, troubled and sorrowfully clouded, grow calm, as the "Peace, be still!" of His command was audible again above it: all this was ours, but it cannot be yours who read these lines.

When she heard that voice at length bidding her come, there was a radiance on her countenance that made it tenfold more holy than it had always been. She looked out on the sea, and spoke in a few words of her delight at reaching this place to die; and then whispering in her mother's ear words that were meant for no other—words that hum immortal music and comfort to a mother's heart—she turned to all of us and said, "Good bye," as quietly as if she were but going across the water for a day. Then she folded her hands and prayed; and then her lips uttered, in low notes, the words of a hymn we had sung a few days ago: and then she was silent a brief space—and then—and then——

What was it then, oh doubtful, faithless man! who neither in thought nor in the flesh hast followed the footsteps of the Lord—what then? Think you it was a dream, a fancy, a phantasy, that, as we stood there silent and breathless around her couch—father, mother, friends, and servants—we heard a voice from heaven saying, "Blessed are the dead that die in the Lord," and yet another voice, "Blessed are they that mourn, for they shall be comforted."

She lies in the tent yonder, a statue of exceeding beauty. To-morrow we will bury her. The people of the town of Tiberias—Jews, Christians, and Turks—have been very kind, and have offered all the attention their poverty enables them to do. The Jewish Rabbi-in-chief proffered a burial-place among the dead of his kindred; and the Greek priest came after him to say that his people would not object that this our beautiful clay should lie among dust that rested in their faith. But we have chosen a spot on the hill side above the sea, where she can lie and moulder in the dust, for she expressly forbade her parents to move her from holy soil; and here, in the resurrection, among the dead of ancient days, who heard not the voice of the Master when He spoke in earthly tone, reproaching with her holy face the men of Bethsaida and Capernaum, our child will stand up an angel.

I close this my last letter from the East in the saddest yet the holiest evening I ever experienced. I have no heart to pursue my pilgrimage any farther. Bowed down with the weight of grief, I feel the solemn truth of the words of the Preacher, "Vanity of vanities: all is vanity." To-morrow for England and home!

D. T.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary general meeting of this society was held on Tuesday, the 3rd inst.,—Roger Fenton, Esq., M.A., in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Malone remarked upon the unexpected conclusion at the last meeting of the discussion upon the collodion report and Mr. Hardwich's paper.

The Chairman suggested that Mr. Malone could give notice of motion to re-open the discussion; and later in the evening the following resolution was moved by Mr. Mayall, seconded by Mr. Malone, and duly put and carried:—"That this meeting recommend the council to re-open the discussion on the Report of the Collodion Committee, and on Mr. Hardwich's paper on collodion, at the next meeting in May, 1860."

Messrs. A. Marion & Co. exhibited two cases for keeping paper a long time after it had been sensitised.

Mr. Shadbolt exhibited an effective arrangement, adapted to one of Melhuish's metal cameras, for exposing and closing two or four lenses simultaneously in the shortest possible time, for instantaneous pictures. He went through a description of the apparatus, which, though simple and easily described with the apparatus in hand, would require diagrams to make our report effective.

The Secretary then proceeded to read Mr. Sutton's

Description of the Panoramic Lens.

I regret that I cannot be present at the discussion on the panoramic lens, but Mr. Cox will show you some apparatus, and explain how to use it.

The No. 2 lens and camera for pictures 7 × 3 can be carried in the coat pocket. The little pictures taken with this instrument and printed upon albumenised paper are very pretty, and the details very fine and elaborate. It is suitable for taking most interesting little views of skies and waves instantaneously with the large stop. Artists who travel for the illustrated journals would find it convenient to use this camera, and take their pictures upon dry collodionised sheets of mica, a hundred of which would occupy but little space in their pocket. I cannot promise that the negatives would be so perfect as those upon glass, but they would be of great use to wood engravers.

The No. 4 apparatus for pictures 15 × 6 is very suitable for amateurs who work with the wet collodion process in a narrow tent. As the curved glasses are expensive, I should advise not to take more than six for an ordinary trip. All negatives which are not absolutely first-rate may be removed from the glass by the following simple process:—Dry and varnish the negative with spirit varnish, then apply to the film a damped sheet of gummed paper. Let this get dry spontaneously, then put it into water and peel it off the glass. In this way you have a paper negative of the subject you wish to preserve, and a clean glass for another attempt. I fancy no one would dream of transposing a first-rate negative.

The best lens for paper pictures is that which I call No. 6. This is 4 inches diameter, and 13 inches focal length. The focus being so long in proportion to its diameter, it will not work so quick as the other lenses. This lens will cover half a sheet of Canson-paper, or even 25 × 10 inches, if the paper is large enough. With a ½-inch central stop it admits a ⅜th-inch pencil upon the front lens. With a high-view lens, 12 inches focus and ⅜ths stop, a paper negative can be taken in full sunshine in three minutes, or less. The time of exposure being the same with the No. 6 panoramic lens, it follows that paper negatives 25 × 10 can be taken in three minutes; that is, in the same time as ordinary paper negatives 8 × 6.

I strongly recommend the No. 6 lens and the paper processes to the notice of amateurs. Hitherto the collodionists have had the laugh against the paper men, but now the paper men can turn the tables upon the collodionists, which the latter are afraid of venturing; even upon a No. 4 panoramic, and contenting themselves with 9 × 7 flat pictures, and an angle of 35°, the paper operators can produce grand panoramic pictures, accounts of which would fill the newspapers next year, while the 9 × 7 bits of collodion would be treated as mere repetitions of what has been done before equally well. The panoramic lens is a grand opportunity for paper work, and it introduces no new difficulties whatever; in fact, the time of exposure is reduced.

In definition and perfect achromatism the panoramic lens is unsurpassed. All along the horizontal line of a view embracing 120° the definition is as good as it is in the centre of the best flat picture. If in any case it should fail at the sides of the picture, that could only be attributed either to an inaccuracy in the radius of the curved glasses or in the centering or mounting of the lens. Such an accident ought never to occur now that we have got things into good working order.

No focussing is required. All objects upon the horizontal line are in focus which are situated between a certain distance from the lens and an infinite distance from it. That certain distance depends upon the focal length of the lens and the size of the stop. If we call that distance the "focal depth of the lens," then the focal depth of the No. 4 lens with a small stop is about 30 feet, and the focal depth of the No. 2 lens 15 feet.

The shorter the focus the greater the focal depth. I have never found the use of focussing in any view-lens, and I worked for two years almost daily without altering the focus of my lens. The smallest stop was the remedy for all optical as well as for some chemical difficulties. If every one agreed with me, and had thought the matter over as much as I have, we should hear no more of the double-bodied sliding and folding view-cameras, or of any of the complicated contrivances for focussing; nothing would be seen out of doors but the single folding camera, which came out soon after the discovery of photography, and the panoramic camera which we are now discussing. My advice is to focus for an extremely distant object in the centre of the picture, and fix the lens at that. If any very near object is refractory, humour it with the smallest stop. An object must be very close indeed if that does not make it sharp with a short-focus lens.

The mode of coating a curved glass 15 × 6 is as follows:—

You hold the glass with its convex side towards you, and begin by pouring the collodion upon one end.

You then gradually elevate the coated end and lower the other, letting the pool of collodion flow towards the middle, until half the plate is coated.

You continue in this way until the whole of the plate is coated, and then you pour off the surplus collodion into the bottle.

In developing the picture you pour on the developer in exactly the same way, only rather quicker, and you let the developer flow backwards and forwards from one end of the glass to the other, until all the details are fully out, and the proper intensity obtained. The left hand should be protected from stains by wearing an india-rubber gauntlet, and a sheet of thin gutta percha should be tied over the sleeve of the left arm.

Any collodion will do in cold weather; but I have no doubt that, when the hot weather comes, alcoholic collodion will be indispensable to success.

In sun-printing the pressure-frame must be turned twice during the exposure, and it is the trouble of doing this which constitutes the chief and, in fact, *only* drawback to panoramic photography. I foresee that, with many persons, this will be a fatal objection, although others may make light of it. He who can get a good negative will probably make little difficulty of the printing.

It is scarcely necessary to say that no one should attempt to work with collodion upon curved glasses unless he is sure that his chemicals are in good order. The object is not to experiment, but to take pictures. Flat plates are better for experiments, because if they get broken there is less harm done. Anxious as I am to see the panoramic lens come into general use, I do not desire to see it at first in any other hands than the most experienced. Until a few first-rate photographers have tried the lens, and expressed their opinion of it and exhibited specimens, I do not care much to see it in the hands of the inexperienced. Better make sure work, and go on slowly at first. But panoramic photography is a new field, in which those who first succeed will carry off the highest prizes.

The Secretary then read a paper from Mr. Sutton *On Panoramic and Plane Perspective*. [See page 109.]

The Chairman called upon Mr. Cox to explain the construction of the camera.

Mr. Cox stated that he had not the slightest idea that he should have been called upon; and although he found that Mr. Sutton had forwarded an intimation to the Society that he (Mr. Cox) would explain the details of the apparatus, he had not forwarded a like intimation to him. He therefore hoped to be excused if his description was not so full and clear as it would have been had he been prepared. He then explained the use of an instrument for holding the bent glass, which was a clamp adapted to the bent form of plate. There was the dark slide of the camera just like an ordinary glass slide, excepting that it was curved in the form of the segment of a circle. There was a pressure-frame which required to be turned occasionally partly round towards the sunlight, but not when printing with diffused light. The camera, with regard to the focussing, was rather in contradiction to the terms of Mr. Sutton's communication. There was a slight focussing arrangement, but which was only a simple convenience to the manufacturer. He found that it was impossible to make a camera so exact that the focus should be true without there was some means of adjusting it. No mechanic could work so closely as to get the correct focus in the first instance, but once obtained, it served for ever. Mr. Cox proceeded to coat one of the bent plates by holding one end of the segment much below the other end, which he held by the left-hand corner; he then poured the collodion along the edge of the lower end, and afterwards gradually reversed the position of the ends, allowing the collodion by its gravitation to flow over the whole plate, until it run off at the other end of the plate, which had thus become the lowest end. He then stated that, after immersion in the curved bath and exposure in the camera, the development would be conducted in precisely the same manner. He then proceeded to describe the camera and lens, and said the focus was seven inches and an eighth, for which the glass was curved. As for an object at 150 feet, he did not find at a distance of 150 feet (and that was as far as in the London atmosphere he had been enabled to obtain a focus) that, with a half-inch aperture, there was any perceptible difference in the focus. Using the three-quarter inch aperture, he did not find any perceptible difference in three-quarters of a mile. He had a lens with a stop giving an aperture of half an inch, and that he found would give a sharp definition at a distance of forty feet, and at a distance of a quarter of a mile. With a half inch stop and $7\frac{1}{8}$-inch focus from forty feet to a quarter of a mile, there was no difference in the focus of the lens. There were two fans placed in front of the central aperture, and the object was to shut out the oblique rays from the central aperture; thus when the light was directly in front of the lens it passed straight through, but when the light was at the side of the lens it went through the side, the fan cutting it off from the centre. If it were merely a circular hole the centre of the picture would receive much more light, and would be solarised before the edge. By using the fan-like stop, whether the principle be right or wrong, the object would be effected.

Mr. Mayall said, they had had a comic English grammar, a comic History of England, and now the photographic world was to be treated with a comic camera — a camera constructed upon principles which utterly ignored all focussing. He did not know whether Mr. Cox's explanation elucidated the subject. At all events, it was but the reproduction of a very old camera, produced in Paris by M. Martin in 1845, and made by Messrs. Schiertz. The difference between M. Martin's camera and the camera of Mr. Sutton was, that M. Martin's was made with an achromatic lens, to be focussed, though not on the usual flat plate. However, M. Martin did succeed tolerably well; and it might be remembered that at that time they had only daguerreotype plates to deal with. He attempted, and in some measure successfully, to make curved plate-holders, to counteract the aberration of his lens. His lens turned on an axis, so as to present the strongest portion of the light to the plate at the different parts; however, it never ended in anything more than some preliminary experiments, worked out by a camera something like the one before the meeting. There was no doubt that for some purposes that camera might be of considerable use, but for the working of collodion on glass it appeared to him to be of very little use to the photographic world, as he did not imagine any extraordinary definition could be obtained with that form of lens. He had not been able quite to follow the Secretary in reading the paper, and he did not know exactly the principle upon which it was founded. At all events, they ought not to ignore the labours of previous discoverers, who had considerably aided the present workers. He saw Mr. Malone was present, and he had no doubt that he might recollect M. Martin's camera. From about 1845 to 1850 M. Martin was engaged with his panoramic camera, and Messrs. Schiertz made it. It was worth while to have *that fact* recorded. Then they had the liquid lenses made by Mr. Archer; and he thought he had had the pleasure of seeing Dr. Diamond working with one, and therefore *that part* of the subject was not new. All that was new was the calculation of curves. He (Mr. Mayall) came to the meeting expecting another kind of subject to be upon the *tapis*, which seemed to be quashed. It appeared to him that there had arisen in this country, as well as in others, since 1851, a system of reproducing the ideas of others; and, while upon the subject, he would mention that there was an invention which went by the name of Woodward's camera. In 1843, while he (Mr. Mayall) was in New York, Mr. Johnson, who was known in this country as a very clever daguerreotypist, bought and sold a reflecting camera, and had at that time a camera almost entirely in construction the same as the Woodward solar camera. He (Mr. Mayall) rose with the desire that some of the early men should not be forgotten in these reproductions; and he thought that the Society should not lend its countenance and influence in putting forward inventions that had been more effectively done years ago.

Mr. Malone was glad Mr. Mayall had spoken first, and he would state that M. Martin's camera gave better results than the one produced to the meeting. Mr. Malone had looked with anxiety at the specimens, because he had noticed the self-sufficient style of the papers put forth by the inventor of the lens, which photographers had better disclaim; for, unless the results produced were better than the present, he could not expect that the Society, or any amateurs of distinction or otherwise, would take up an instrument which, by the results shown, yielded inferior productions. As Mr. Mayall had said, the lens in M. Martin's camera was corrected and arranged for focussing, and here there was no focus. In M. Martin's camera there was a distinct focus to be obtained; and the traversing lens had a peculiar diaphragm arranged behind in the form of a slit, so that as the lens was turned towards one part of the view the image passed through a slit and fell upon that part of the plate which was opposite the slit; then, as the lens turned round, the light impinged upon other parts of the plate, and the first parts were covered up, so that these very ingenious arrangements gave them the means of getting a sharp picture, which certainly appeared to be impossible by Mr. Sutton's arrangement. There is a little ingenuity in Mr. Sutton's arrangement; but the final result is inferior to that obtained by the other method, and for that reason, as practical men, the meeting could not for a moment entertain Mr. Sutton's camera, which was merely an ingenious contrivance that would have been applauded in the first days of photography, but which did not deserve any praise at present — at all events, not that flattering account which the author gave of it.

Mr. Shadbolt came forward in a new character, *i.e.* as a defender of Mr. Sutton—how he might have deserved it was another question. Mr. Shadbolt came forward as defender, because he thought there were quite enough objections inherent in the apparatus before them without attribu-

ting objectionable matters to him which he did not claim. With regard to the matters put forward by Mr. Mayall and Mr. Malone, they were really so extremely prolific in that direction, that it would be difficult to answer them in one evening, therefore he would speak of the lens before them. He regretted especially that so many assertions had been made without any proofs being given. First of all, he took a memorandum of Mr. Sutton's statement, to the effect that focussing with his lens was not necessary. He (Mr. Shadbolt) believed that any one who had paid the slightest attention to optical matters would at once see that the statement of focussing, not being necessary, translated into plain language, meant that he could not focus at all. With regard to Mr. Mayall's observation that no novelty was produced, he thought that was an error into which Mr. Mayall had fallen, from not having examined the lens. It was dependent upon this principle that a sphere of glass containing a sphere of distilled water should be so arranged that the two combined should be achromatised, and that, consequently, for a spherical surface, and for a spherical surface only, it would have a focus for a distant object—an absolute solar focus for objects at a long distance. Now, unfortunately, as the bulk of objects photographers had to delineate did not stand at so long a distance, the bulk of terrestial objects were absolutely out of focus. But, again, it must be remarked that they had not in Mr. Sutton's case a sphere but part of a cylinder to work upon. The remarks made about ignoring focussing altogether resolved themselves into the self-evident fact, that the camera was not adapted for it. He very much regretted that the matter had not been made more tangible than it appeared, for he confessed that, two years since, he believed a panoramic camera a possibility, in consequence of having seen that very camera of M. Martin's. The gentlemen stated that it was owing to the perfection of the lens that M. Martin was enabled to get a comparatively sharp picture; but he (Mr. Shadbolt) thought that that was an error, and that Mr. Sutton's camera would produce a picture as sharp as that of M. Martin's, provided the plate was arranged in the same way. M. Martin's did not describe a part of a circle, though a curve, but had an adjustment by which he could accommodate the daguerreotype plate to the focus of the object immediately under inspection at the moment: he had a means of arrangement by which a part of the plate should be a little nearer or distant from the lens, and it was in consequence of that that he was enabled to get a something approximating to a sharp picture all over. He (Mr. Shadbolt) took some pains to examine the negative from which the picture before the meeting was produced. The negative was in Mr. Cox's shop.

Mr. Cox explained that that was another negative of the same subject.

Mr. Shadbolt stated that, on examining that negative, he was prepared, and expected, and hoped to be able to admit that it afforded a tolerably sharp picture; but, so far from that being the case, he only found about one-third tolerably sharp, and two sides of the picture absolutely out of focus. There was absolutely no correction for spherical aberration, with the single exception of reducing the aperture. The stop which had been exhibited was both a novelty and highly ingenious, and did certainly so adjust the light that the oblique rays were equal to the direct rays. Although Mr. Mayall had stated that there was nothing new, that was something which had really never before been brought before the public; and he thought that Mr. Mayall would, upon examination, absolutely admit that the lens was new. But then the question was not only as to its novelty, but also as to its applicability. With regard to some of the objections to the camera, they must not criticise too closely the assertions made by Mr. Sutton, who evidently was not a man who looked with an eye too unfavourably towards his own project; and although he did occasionally, and perhaps unconsciously, use hyperbolical language, and said that pictures delineated upon flat surfaces produced hideous caricatures, and then went on to argue that, to take a panoramic perspective, you must take it upon a curved surface, yet how did he prove that? He says that, on taking a row of houses exactly identical with each other, but in the form of a crescent—taking them in his camera, afterwards printing them, and spreading the print out flat, it would be mistaken for a straight-built row of houses. Now, *entre eux*, he (Mr. Shadbolt) believed Mr. Sutton had actually found that out from an article in The British Journal of Photography, written by Mr. Grubb, in which he pointed that out, and more than that, viz., that in taking a picture of a long row of flat houses, by means of a panoramic lens, you would have a plate, when opened out, with all the horizontal lines curved towards the extremities. It was quite clear that if they observed horizontal buildings they did not see curved lines, but absolutely straight ones—that could not be questioned; so, under the circumstances, Mr. Sutton said that before he could tell what he had got he wanted to inquire what lens it was taken by, which reminded him (Mr. Shadbolt) of the schoolboy who delineated something upon his slate, and wrote beneath that something "this is a house." With regard to the objections to the use of the lens, he thought the curved glass was its greatest drawback, as it could not always be obtained with the exact curve. With regard to the manipulatory details they might be more troublesome, but if they produced better results there were plenty of resolute men who would successfully grapple with all manipulatory difficulties. He thought it did not succeed so well as the ordinary camera, especially in the focussing.

Mr. Malone thought Mr. Shadbolt was as facetious as the author of the paper, and that he gave up the points which he rose to defend. M. Martin's camera had at the back of the plate-holder a series of screws by which he could adjust, almost at will, the daguerreotype plate, and focussing with a slip of glass, and then putting the screws against the glass in such a manner that he was sure he had got the focus of one portion of the segment, he then went on to the next segment, and so he insured a focus which Mr. Sutton's utterly failed to get. He admitted the novelty in the diaphragm, and gave great praise to it, but Martin's arrangement was better.

Mr. Heath stated that he had but a very few remarks to make, simply because he so completely and entirely coincided with the opinions expressed by the previous speakers. With Mr. Shadbolt himself he entirely agreed, not only in his present remarks, but in those expressed in the March number of the British Journal of Photography. He could not help acknowledging the impartial manner in which Mr. Shadbolt had discussed this question, and he (Mr. Heath) only wished that every one present would be equally judicious. Mr. Shadbolt was an old member of the society, and his opinions were very much esteemed. With respect to the camera he (Mr. Heath) really did not see any advantage at all; and, looking at the curved glasses for the image, the curved printing frame, and he was "going" to say the roundabout way of accomplishing that which was best accomplished in the straightforward way (and which was the better way in all matters of life), he had looked at all these matters as decided disadvantages. Looking at the pictures exhibited, looking at the negative at the last meeting, and recollecting Mr. Sutton's trumpet notes heralding his production, he (Mr. Heath) was much struck with the complete want of definition. That Mr. Sutton had produced an ingenious thing was beyond all question, but no person could venture for a moment to compare it for efficiency with the ordinary productions.

Mr. Hughes observed that there was one peculiarity of the camera which appeared to have escaped the notice of the gentlemen who had spoken of it. In testing its capabilities one should put it through the various positions in which it was likely to be used. Landscapes were not invariably taken with a view to lateral effect, and lateral effect was the sole point for which Mr. Sutton intended the large angle of vision; but in practice there was as much vertical as lateral effect requisite, and how was he to treat that camera with reference to vertical effect? If Mr. Sutton had abandoned the portion of a cylinder, and made his plate hemispherical, he would have been consistent. Supposing he had to take a church with a spire, probably the camera would be turned up at right angles to its usual position, then what sort of a picture would be obtained? and yet without that, which was the only way of getting over the difficulty, the spire would be *in nubibus*. Mr. Shadbolt had stated that if the results were superior to those usually produced, the manipulatory details would be got over; but looking at the pictures produced he (Mr. Hughes) thought it very difficult to come to the conclusion that they ever could be superior—at present they were decidedly inferior. There was none of that two-eyed effect, having a large angle of vision. Purposely waiving the point as to the superior definition altogether, he remarked that they had had the curiosities of literature, the curiosities of science, and when the curiosities of photography came to be considered, that camera must occupy a very distinguished place.

Mr. Le Neve Foster had looked at the pictures and ascertained the remarkable want of definition, although Mr. Sutton appeared to think that there was a great deal of definition. He (Mr. Le Neve Foster) found Mr. Sutton writing in his paper these words:—"*I have never found the use of focussing in any view lens*"—which passage was incomprehensible. Mr. Sutton also said, "and I have worked for two years almost daily without altering the focus of my view lens."

Mr. Sebastian Davis thought Mr. Sutton must have meant his own lens. As far as focussing went his lens would not admit of focussing, for it was supposed to take a picture from a mathematical point in the centre of his view, and to describe a circle round; and it was quite clear if he (Mr. S. Davis) took a given point as a centre, and described a circle around it, focussing would be out of the question, as also if Mr. Hughes's idea of the adoption of a plate of a hemispherical form were to be carried out.

Mr. Mayall believed Sir William Newton was not present, but that picture entirely coincided with Sir William's conditions. He (Mr. Mayall) had not a doubt that, artistically speaking, apart from photography altogether, the picture exhibited was extremely artistic, the lens appeared to be an imitation of the human eye as far as he could see at the present moment; but the discussion about the lens had not put it in any better position. It would only serve the conditions of those artists who said that there was nothing artistic in photography; and let such an artist purchase one of those pictures, and he would find that he had his ideas wrought out. If they fixed their eye on any single object in the room, that object would be seen with distinctness, but every object around would gradually shade off; therefore all the value of the camera was to gratify those gentlemen who, up to the present time, did not admire sharp pictures, but who, like their distinguished member, Sir William Newton, were very fond of having only the central point sharp.

Mr. Eliot did not know whether Mr. Sutton's other lens was in the room, the triplet, which was experimented upon by Messrs. Ross some years ago, and proved by them to be a total failure.

Mr. Cox thought there was some misunderstanding when gentlemen stated that there was no focus at all; for it would be remembered that be had stated that at a distance of about thirty or forty feet to about a quarter-of-a-mile there was no preceptible difference in the focus, and it could not be denied, if they took the cottage in a picture he then produced, that

that cottage was sharp, and the distant object was sharp, or he did not know what sharpness meant. It would be understood that the picture was a developed print—not an albumenised picture. If they altered the focus of the lens nothing would be sharp, because it acted upon the principle that from the centre of the lens to the centre of the plate must be a given distance. The pictures then in the hands of the Chairman proved what the lens would do. The first one was taken in Christmas week, which was not precisely the weather for photography.

Mr. Malone stated that it was not usual to reply upon the final speaker to a question, but when he produced another picture and argued upon it, he must ask to see it, and after seeing it he must be permitted to state that there was a point in it of greater sharpness in the centre than the others; but he maintained that the greater part of the picture was absolutely without definition, and the real question was, not whether any one point was defined, but whether the whole picture was good? The consequence was that the picture, taken as a whole, was a failure, and a decided failure as compared with Martin's productions.

The Secretary then read a paper by Mr. J. Wyard, *On the Production of Photographic Pictures on Glass or Porcelain, by enabling them to be burned in*—of which we give the following abstract:—The author effects his object by covering the porcelain or glass plate, first slightly warmed, with a solution of gelatine, gum arabic, and bichromate of potash, to which are added a few drops of honey syrup. The film is dried by the fire, and exposed to the light under a positive photograph for a few minutes in good sunshine. The ceramic colour, finely ground, is then applied to the surface of the film by means of a cotton pad, when it will be found that colour will adhere only to the unsunned parts of the film, forming on it a positive representation of the photograph to be copied. The film is then washed with alcohol, to which a small quantity of dilute nitric acid has been added, and when the brown colour of the changed or sunned portion of the bichromate film disappears, the plate is washed with pure alcohol and dried rapidly. A flux is then applied as follows:—A solution of Canada balsam in spirits of turpentine is poured over the plate, which is then dried by heat, and the flux, consisting of borax and glass, or borax, glass, and lead ground fine with water on a slab and dried, is applied evenly by means of a cotton pad tied up in very soft and flexible leather. The plate should be glazed prior to the application of the film.*

Mr. Mayall thought he could add some information upon the subject, having been engaged in about 1850 upon the subject of transfer. After the collodion was invented he went to see his friend Dr. Diamond, who was at that time developing his pictures with the protonitrate of iron producing great metallic lustre, and the idea struck him (Mr. Mayall) that if they could be transferred to cameos in some simple manner they would be extremely valuable. He set to work to try to transfer them to porcelain or glass. He took some twelve or fourteen portraits of various sizes; he washed over the surface of the collodion with a weak solution of gum, and then pressed down the enamelled glass upon the gum, and let them stay in contact for a short time He then dragged the two apart, and in that way transferred the collodion to the piece of glass which had been made expressly for the purpose, so that with a very slight heating in the muffle-furnace it would melt in. He then placed a very thin film of microscopical glass upon it, and passed it into the muffle-furnace: sometimes it melted the whole thing down into the glass, and sometimes he lost the image entirely, but when the process was carefully done the image of the photograph was melted in between the very thin glass over it and the very soft ductile glass under it, and was thus rendered impervious to the atmosphere and to scratching. He knew that there were now in the possession of Her Majesty a number of pictures that he did at that time. Then a M. Andrew Bulot having heard that he had done a number of things, came over from Paris and waited upon him (Mr. Mayall), who had been trying experiments with collodion excited by the iodide and bromide of cadmium. He (Mr. Mayall) also had an interview in London with Mr. Minton, of the Potteries, on the subject, with the intention of transferring copies of the old masters to vases, and to plates, and a number of things of that kind: however they were very busy, and he (Mr. Mayall) was similarly situated, and it came to nothing. He believed M. Andrew Bulot took out a patent for a process which he introduced into this country, but he was obliged to make some arrangement with him (Mr. Mayall), as he had done the same thing before, and he was to have had some benefit; but he knew that, after he had advanced a considerable sum of money, the party disappeared and the process with it, and there was an end of the matter. It was quite as well that it should be known that processes of that kind were to be done, and it was astonishing what an extraordinary heat even positive collodion would stand in the ordinary muffle-furnace, and if it were covered with a thin glass, containing a large amount of lead, an ordinary photograph would produce almost the appearance of enamel. He was quite sure there was great value in the process, and hoped some gentleman would carry it out. He thought M. Bulot's patent was dated in 1851 or 1852. If he had been aware of the paper being read he would have brought a handful of specimens.

M. Joubert had listened with great pleasure. He was now engaged upon a patent process for burning photographs in glass and china in colours. Mr. Mayall's statements were interesting, but they only related to one colour. M. Bulot's patent could not come to any good, because he had not found out the means of applying different colours, which of course could only be obtained by processes different from the collodion process. His own process was only recently patented, and not specified, therefore he would be excused if he did not divulge it; but he would say that he did not use any collodion at all—it was a very different mode altogether: it was, as it were, grafted upon another process. He was under a promise to the society which, he regretted to say, had not yet been fulfilled, of presenting to the society a number of specimens. There had been some difficulty in the mechanical part of the manipulation which had been kindly alluded to in the last number of the Journal; but he had done some even that very day, and had been engaged upon it constantly. He had been in great hopes that they would have been presented in April, but he would confidently say that they should be presented in May. He (M. Joubert) then exhibited two specimens of his new process, which were very beautifully burned in without any glass above the surface.

Mr. Mayall had forgotten to say, that not only did he produce them with a variety of colours, but with a variety of backgrounds. An ordinary photograph fixed upon a rich ruby glass gave a very beautiful effect. He ground some specimens of twelve or fourteen kinds of coloured glass into impalpable powder; and with the impalpable colour they coloured the portraits, and then put the thin film upon them, and passed them into the furnace. Very extraordinary results were obtained; for in some cases where the cheeks were put in red they came out green, and in other cases blue, by some strange property in the silicate. It was extremely uncertain whether a lady painted in most beautifully did not come out a greenamoor or a blackamoor, though it did sometimes happen that the ground glass came out the same colours as were put in. If any gentleman of sufficient standing as a scientific man would seriously take up the subject, he (Mr. Mayall) would give him a drawerfull of results to assist him. There was something more in it than was at present fancied, and there was no doubt the silicates of some of the metals must be used in the shape of pigments, and perhaps they ought to be slightly more fusible than the glass itself. Without knowing anything of M. Joubert's process, he would suggest the use of the more easily fused silicates for the higher lights, the less fusible for the middle tints, and still less fusible for shadows. He was very glad that something had come before the society. Gentlemen must be very careful in steering clear of a patent already in existence, although he (Mr. Mayall) thought M. Bulot's had about expired. By using silicates for pigments a variety of colours would be produced, highly interesting to ceramic art.

Mr. Malone asked Mr. Mayall to pardon him for reminding that gentleman that he (Mr. Malone) was the first person that ever attempted to burn photographs into materials.

Mr. Mayall begged Mr. Malone's pardon, and recollected seeing his specification.

Mr. Malone stated, with regard to heating a picture, that it was found that silver pictures, when in contact with substances with which they combined, gave a faint or feeble picture. It was also very clear that, if chromium, and things of that kind, were used, instead of silver, there would be no difficulty in procuring an intense picture. His object had been to make negatives upon porcelain; and it would be seen that, if it could be done upon porcelain, it could be done more easily upon glass, because in that there was a silicate of potash, more easily combined. If a salt of chromium were used, instead of a salt of silver, a red picture would be produced; but nobody would look at their portrait entirely in red: moreover, the portraits of chromium did not yield equal delicacy with that of the silver process. Long since pictures by means of chromium salts had been produced in Paris. His experiments were interrupted by not being able to get porcelain in thin slabs. He spent some days at Mr. Minton's, vainly endeavouring to get him to procure some thin slabs of porcelain by means of his hydraulic pressing apparatus. Mr. Minton was so busy at the time, making the compressed tiles, that he could not take the matter up, saying he did not think it was feasible, and endeavoured to discourage him; but he (Mr. Malone) did not give it up, but went, after the exhibition of 1851, to Sevres, and, strange enough, there met Mr. Minton, who recognised him. Mr. Minton, guessing the object of his visit, said:—"Oh! Mr. Malone wants to burn photographic portraits on porcelain, but it cannot be done." Mons. Ebelmen had previously privately said it could, and offered to place the Government establishment of Sevres at his disposal. He mentioned this to show that there was something to be done. If it were asked why it was not done, it would have to be remembered that about that time there were political changes in France, and that both Mons. Ebelmen and Mr. Minton had died since then, and that was the reason the experiments had ceased. The first thing was to procure the biscuit porcelain translucent, and yet retaining porosity, so that a metallic solution could penetrate it, destroy the albumen, or whatever else it was put in with, and then oxidate it. The silver picture was so faint, that recourse must be had to chromium and manganese, and then the picture was not so delicate; still it was quite clear that good pictures could be at once burnt into thin slabs of porcelain. His proposition was to take a solid slab of perfectly homogeneous porcelain, and then to saw that slab through. M. Ebelmen said *it was* practical, Mr. Minton said *it was not*—that it would be full of holes and other imperfections; and so it was—at least that which was made

* We would draw the attention of those of our readers who have an opportunity of visiting the rooms of the Society of Arts, Adelphi, London, to specimens of the processes of Mr. Wyard and M. Joubert, now on view at the society's exhibition, being numbers 144 and 143 in the catalogue. Judging from the large enamel of *The Head of Our Saviour*, we should say that M. Joubert was far in advance of Mr. Wyard in the perfection of his manipulation.—Ed.

in this country. As Mr. Mayall was anxious that merit should go where it was due, he (Mr. Malone), when seeking for a small share, could not be asking for too much.

M. Joubert remarked that what had been said by Mr. Mayall and Mr. Malone only showed that for a number of years attempts had been made to transfer photographs, but that no one had ever taken up the subject of treating them in different colours, except that which the medium on which the photograph was made could produce, and for the reason, that it was only recently that the means had been found of using any given colour, and in that was the very medium for which he had taken out his patent: it was for transferring them in any colour, or with two or three colours in any picture, which no photographer had attempted to do. The process which Mr. Mayall had described could only produce one colour, and that the colour of the photograph.

A Member: Mr. Malone said it was necessary to have tiles of that very complicated manufacture. He (the speaker) had had the pleasure of seeing lately very beautiful specimens of M. Joubert's burned into the common glazed Minton tile, quite perfect in form and colour, in red, yellow, brown, green, and indeed there was no limit to the colour, which was the great desideratum of the present day. The burning was perfectly genuine, and there was no attempt at putting a film upon it.

Mr. Malone said that he was then speaking of translucent tiles, while the last speaker was alluding only to opaque tiles.

The Chairman read a paper which had been placed in his hands, which stated that Mr. Davenport was the first who proposed the use of porcelain instead of paper, and for which he procured a premium in 1849 from the Society of Arts.

Mr. Davenport rose and stated that the circumstances under which it occurred would probably be brought to Mr. Malone's memory, by the fact that in about 1849 he was making experiments in the manufacture of paper—he believed at Maidstone—with a view to getting rid of the irregularities of the surface of the paper used for the Talbotype process. At that time Mr. Davenport and Mr. Malone frequently met at the Society of Arts, where were being held exhibitions of manufactured articles. Among the articles exhibited were a number of beautiful biscuit figures in china or porcelain. It occurred to Mr. Davenport that if the biscuit body could absorb a certain portion of chemicals, a perfectly flat surface would be obtained to print through; and Mr. Malone would remember that, conjointly with him, they drew up a paper, which was recorded at the Society of Arts. Mr. Davenport did not wish in any way to detract from Mr. Malone's experiments.

Mr. Malone said that, after the direct appeal to his memory, he must say that he had completely forgotten any such circumstance, though if Mr. Davenport's memory were correct, still he (Mr. Malone) was the first who attempted to carry it out. He by no means contradicted Mr. Davenport without looking at memoranda and dates, but there was the fact that no one had done anything of the sort, or proposed anything of the sort previously.

Mr. Manley exhibited an extraordinary expanding camera, which he called a telescopic camera, in consequence of the range and manner in which it could be extended by draw-tube compartments. It was intended for long or very short focus lenses, and for copying. The arrangement by which the various compartments were brought into action, and focussed by aid of an endless screw, was very ingenious. A novel feature, and of general applicability, was the disposition of the focussing screen. Instead of sliding into a vertical groove as usual, it was drawn forth from a horizontal receptacle in the roof of the camera, and then by a hinged motion lowered into its proper position, without being detached from the instrument, where it was fixed by a spring. When done with it was returned to its compartment, and was thus always out of the way and out of danger when not in use for focussing.

The thanks of the society were tendered to the several gentlemen who had brought papers or objects before the meeting; and the Chairman announced that the next meeting would be held at their new apartments in King's College, on which occasion it was expected the President would take the chair.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The usual meeting of this Society was held in George Street Hall, Edinburgh, on the evening of the 10th instant. Sir David Brewster, President of the Society, occupied the chair.

The minutes of former meeting having been read and approved of, the Viscount Strathallan, Strathallan Castle, Auchterarder, was admitted by ballot as an ordinary member of the Society.

The President then read a *Notice respecting the Invention of the Stereoscope in the Sixteenth Century, and of Binocular Drawings by Jacopo Chimenti, da Empoli, a Florentine Artist.*

Sir David having had occasion to inquire into the history of the Stereoscope, found that its fundamental principles were well known to Euclid, Galen, Baptista Porta, and others. B. Porta, in 1599, gave a complete drawing of two separate figures as seen by each eye, and of the combined picture placed between them. Hence not only the principle, but the construction of the stereoscope was here recognised. Still, however, there was no proof that any person had drawn a right and left eye picture of any object and united them either by the eyes or by an instrument; and it was scarcely to be expected that any such discovery could be made. Last summer, however, when Mr. Alexander Brown, with his brother Dr. John Brown, was visiting the Musée Wicar, at Lille, the former gentleman observed two water-coloured drawings placed side by side, and so perfectly similar that he could account for the fact only by supposing them to be binocular pictures, intended to be combined into relief either by squinting with the eyes or by an instrument. The size of these pictures was about twelve inches by eight and half inches. They were executed by Jacopo Chimenti, da Empoli, a painter of the Florentine School, who was born in 1554 and died in 1640. They represented the same object from a slightly different point of view. The subject was a young man sitting on a bank, and Mr. Brown saw it to most advantage at a distance of four or five yards. By the usual mode of looking at stereoscopic pictures without an instrument, Mr. Brown succeeded in getting the two pictures to coalesce, when they formed one picture in perfect relief.

Sir David concluded by stating that he had some correspondence with a view to getting photographs taken of these interesting pictures, but that at present there were some difficulties in the way of accomplishing this which might eventually be overcome.

The Chairman then read a letter which he had received from Mr. Skaife, respecting the "Pistolgrams" exhibited at the last meeting.

Mr. Tunny said that it would be in the recollection of those who were present at the last meeting, that his observations at that time had no reference to the merit of Mr. Skaife's invention. When Sir D. Brewster, on that occasion, presented Mr. Skaife's specimens to the members, Mr. Tunny understood him to have said that they were preserved from damp or other atmospheric influences by enamel, and, upon examining them, he (Mr. Tunny) had stated that the appearance of the specimens did not warrant him in supposing them to be protected by enamel or homogeneously combined, but that the two plates of glass rather seemed to be cemented together by some cement holding together the edges of the glass from which the collodion had been removed, and he had proved this at the time by separating the two glasses. Mr. Skaife had not relished the liberty Mr. Tunny took with his pistolgrams, and, as most present would be aware, had written (in anything but a good spirit) to one of the Edinburgh daily papers, the *Caledonian Mercury*, denying the correctness of Mr. Tunny's surmises. As he had made his observations at the last meeting he waited till the present meeting to reply to that letter, which he would do as follows:—Having procured from England some of Mr. Skaife's pictures he would immerse one of them for a short time in a small bottle of benzole, which he had brought with him, when he expected that in a few minutes he would be enabled to show them the glasses separated without having this time recourse to his knife.

[Later in the evening Mr. Tunny removed the specimen from the benzole, when the cement was so soft as to enable him to separate the glass cover from the picture, in which state it was handed round the room.]

A paper was then read from the Rev. T. M. Raven. It was designated, *On the Preparation of Paper for the Waxed-Paper Process, with some Remarks on the Effects Produced on Sensitised Positive Paper by Contact with Papers which have been Exposed to Light.*

The chief topics embraced by Mr. Raven's paper, in addition to the above, were gutta percha as a material for making baths, dishes, &c., for photographic purposes; lenses for views, &c.; although a variety of other subjects were introduced. He had been a good deal engaged in testing lenses for some time past, with a view to obtain one for his own use. He had a very good orthographic lens by Ross, which he had had corrected by Mr. Ross shortly before his death; but to beginners he would recommend a good lens of the ordinary meniscus form. He had for a few days last summer been trying collodion instead of waxed-paper, and used Smartt's tent, which he could recommend, as it was easily put up and taken down. A great deal more could be done with waxed-paper than was usually supposed, and for out-of-door purposes it had greater advantages than most other processes. In the waxed-paper process most operators used too much acetic acid. He detailed the mode of preparing paper and operating which he employed at present, the most important feature of which was that he found it expedient to discard the use of gutta percha baths in the whole of the operations connected with this process. In the common sheet gutta percha of the shops, small red spots might be seen. These Mr. Raven had often found transferred to the picture. He preferred *glass* dishes and baths. With respect to the exposure, he was understood to say that, in his experience, the farther he went south, the longer was the exposure required. It was his intention to publish a manual of the waxed-paper process; but those desirous of practising it would find ample directions in the back numbers of The British Journal of Photography. He concluded by some remarks on the new action of light recently noticed and commented on by Niépce de St. Victor, but on which nothing new was elicited.

Mr. Horatio Ross said that, when he was recently at Hythe, he had the good fortune to meet with Mr. Roger Fenton, and some conversation he had with him induced him at this time to make one or two remarks. He might begin by stating that Mr. Fenton was just as good a rifle-shot as he was a photographer, and that was saying a good deal. On telling Mr. Fenton that he found gutta percha discolour his nitrate of silver, he was told by him that he (Mr. Fenton) had kept his bath in gutta percha for five or six years; but it took him several weeks to prepare the gutta percha bath for this purpose. He had, first of all, kept it full of water for a fortnight; then he had filled it with a solution of cyanide of potassium;

then with nitric acid and water mixed, and, lastly, by a copious washing with water — and by this treatment he had kept his silver in good order for several years. Now and then he pours out his bath, and, by mixing whiting with it, makes it neutral; and then gives it the desirable faintly-acid tinge, by adding to it some fresh nitrate of silver. He had seen Mr. Fenton operate, and nothing could be neater.

Mr. Moffat had found glass baths for nitrate of silver to answer much better than gutta percha ones, although the latter, from their comparative lightness, might be better adapted for a travelling photographer.

Mr. Finlay Anderson remarked that Mr. Raven seemed to have changed his views, as it was not much above a year since he (Mr. Raven) had recommended to him a gutta-percha bath, with a piece of glass laid on the bottom.

Sheriff Moir and Mr. Taylor made some remarks on the greater length of time required to expose a photograph in Africa compared with this country; after which,

Mr. Finlay Anderson read a short paper *On Photographic Landscapes*. He complained that a disagreeable, ill-balanced effect was observable in many pictures of this class, owing to there being too much foreground and too little sky introduced. The remedy of this was very obvious. The sky line he thought should, in most cases, be a little below the centre of the picture.

Sir D. Brewster spoke of the advantages to the photographer of an erecting camera, in which the picture might be seen exactly as in nature, and not upside down, as in the ordinary camera.

After an intimation by Mr. Horatio Ross that he had a paper, written by Mr. Claudet, to read at the next meeting of the society, the meeting separated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this society was held on Wednesday, the 4th instant, at the rooms of the Literary and Philosophical Society, 36, George Street,—W. C. Williamson, Esq., presiding.

Mr. E. Mann, the Hon. Sec., called the attention of the members to the subject of the album which had been purchased for the purpose of inserting the portraits of the members of the society, and which it was thought would form a very important and interesting record, and said the council of the society regretted very much that the members were so slow in contributing portraits. He had, however, now the pleasure of stating that Mr. A. Brothers had contributed a very excellent portrait of the Lord Bishop, the president of the society, which was handed round to the members, and very much admired; and he hoped that, as a commencement was made, the members would have less hesitation in making their contributions to the album. The Secretary also handed to the members a stereoscopic instantaneous picture, which Mr. Brothers had brought to show to the meeting.

Mr. Brothers said he had purchased it because he considered it the most wonderful instantaneous picture he had seen. The subject was some steamers on an American river, taken whilst moving at great speed.

The Secretary mentioned that the proposed exchange club was progressing very favourably. He had now obtained fourteen names, and it was proposed as soon as the number amounted to twenty to form a committee to carry it out, and he should therefore be glad to receive further names.

Mr. W. T. Mabley then read a paper *On Photographic Printing upon Paper*. [See page 110.]

Mr. Wardley moved a vote of thanks to Mr. Mabley for the paper he had read, which was seconded by Mr. Parry. He (Mr. Wardley) said he thought the way in which Mr. Mabley had treated the subject was most excellent, and that the numerous experimental illustrations were most valuable.

The Chairman said he was sure the very best thanks of the society were due to Mr. Mabley for his paper. He considered Mr. Mabley had adopted the only true plan by investigating into the very foundation of the process; and that if the photographers of the society would conduct their experiments on a similar plan, the Manchester Photographic Society would be second to none.

The best thanks of the meeting were unanimously accorded to Mr. Mabley by acclamation.

Mr. Parry said he should be glad to suggest (if Mr. Mabley was willing) that he should present his experimental illustrations to the society's portfolio, as they would form a very valuable record.

Mr. Mabley said he would be very happy to accede to the request.

Mr. Offer said he should be delighted to hear a promise from Mr. Mabley that he would at some future meeting continue the subject of the printing process, which he had so ably commenced.

Mr. Mabley said such was his intention, and he should be most happy to do so. In preparing his paper he had found it quite impossible to deal with the whole subject in one evening; and he had first confined himself to the silver sensitising bath, and would treat of the gold toning bath on the next occasion.

Mr. Wardley remarked that he had not found that paper sensitised and kept some time was any more difficult to tone in consequence.

Mr. Brothers remarked that he was troubled with the removal of the albumen, by using the alkaline gold for toning.

Several of the members thought that if the silver was strong enough such would not be the case.

Mr. Brothers said Mr. Mabley had mentioned a printing frame which he had used, having no plate glass before the negative, and asked to see it. It was handed to him by Mr. Mabley; but it was thought to be unsuitable for large negatives, as sufficient pressure could not be used.

Mr. Mabley said he always used a piece of thick flannel in the printing frame, and found it very excellent in producing an equal contact with the negative.

Mr. Wardley exhibited some excellent prints, taken by a bath four years old, and which had been in constant use for negatives, &c., and no doubt contained many impurities: this showed that almost any kind of bath containing sufficient silver would do for printing on paper.

Mr. Parry exhibited a remarkably compact stereoscopic camera, constructed by himself, which was thought to be the most portable thing the members had ever seen. It would go quite flat, was very light, and might be put into the pocket. He also exhibited a very convenient bag or hood for changing plates, having a small board at the bottom, forming a table on which to rest the plate-box, and which Mr. Parry said he found particularly useful.

After a vote of thanks to the Chairman, which was passed by acclamation, the meeting closed at a later hour than usual.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The annual meeting of the above Association was held at the Chorlton Town Hall, on the 11th instant,—Mr. John Fawcett in the chair.

After the minutes of the last meeting were read and confirmed, the following gentlemen were elected as officers for the present year:—

President—Professor Roscoe.
Vice-Presidents { Mr. J. H. Nicholson. / „ William Griffiths.
Treasurer—Mr. William Hooper.
Hon. Secretary—Mr. John Heywood.

Council.

Mr. John Rogerson,	Mr. John Fawcett,
„ Thos. S. Sheard,	„ E. Whaite,
„ G. Wardley,	„ C. Aden.

The Secretary then read the following Annual Report of the retiring council:—

ANNUAL REPORT.

In presenting their report of the third year's proceedings of the society as required by the rules, the council feel that few incidents have occurred during the past year that offer subjects for special comment. The general attendance at the meetings has been about equal to that of last year.

Papers have been contributed by —
Mr. Draffin — *On Comparative Experiments on several Dry Processes.*
Mr. Heywood — *On Toning Positive Prints.*
Mr. Hooper —*On the Camphine Waxed-Paper Process.*
Mr. Griffiths — *On Enlarging Glass Negatives.*

The paper of the first-named gentleman, formerly secretary to the society, but now residing at a distance, was accompanied by several specimens, which he kindly allowed to be disposed of for the benefit of the society. All the papers gave rise to interesting discussions, which, it is hoped, would not be without profit to the members.

The number of papers read during the past year have not been numerous. The council lament that such contributions to the common fund of instruction and entertainment should be confined to a very few of their members; and they would urge on those who have hitherto hidden their light under a bushel, to lend their aid, as far as possible, in making the society a useful centre for the diffusion of photographic knowledge.

No very scientific and learned theories or investigations are asked for or expected; but if members would make a note of any of those unlooked-for results which are constantly occurring in the practice of our art, and communicate them to the society, they would add much to the interest of the meetings, and often be the means of leading others to institute experiments which might lead to important results.

In the chief end, however, which the society has in view, the council confidently trust that their association is fulfilling its mission, and rendering itself worthy of support: as offering facilities for interchange of opinion — of mutual help — of social intercourse, and the formation of friendships, cemented by an ardent devotion to a fascinating and refining pursuit.

It was carried unanimously, that the report now read be received, and entered in the minute book.

A vote of thanks was passed unanimously to the President, Vice-President, Treasurer, Secretary, and the Council, for their attention and devotedness to the interests of the Society.

The Chairman, in putting this, remarked that, from the very small subscription—only five shillings per annum—there must be economy used to bring the financial affairs of the Society to the present position. He noticed the treasurer had a small balance in hand, which he had not expected.

Mr. Pershouse and Mr. Nimmo were elected members of the Society.

Mr. W. Griffiths then read a paper *On a New Dry Collodion Process*. [See page 111.]

Mr. Hooper exhibited a waxed-paper negative, prepared by a gentleman who had no other means of working than the published accounts: he had never seen a waxed-paper prepared by any other person, and yet the result was above the average of production. He merely brought this before the meeting to show the simplicity of the waxed-paper process. Whilst speaking, he wished to remark that the paper read by Mr. Griffiths was entitled to the consideration of the Society. He believed it was quite new, and Mr. Griffiths deserved the best thanks of the meeting for bringing it at once before the Society, and, through them, to the public. He believed it was chemically correct, and hoped the members would try it, and report to the next meeting their success. Since last meeting Mr. Keene had published a modification of the Fothergill process, which was

very good; and he found it as quick as the two-dram washing, without the liability to stains.

Mr. Heywood said that it was quite true that the new modification was as quick as the old Fothergill process, and the absence of stains was an improvement; but the greatest drawback, he feared, was blisters rising, which had already occurred with him: he believed it was caused by using the albumen too thick.

A vote of thanks was then passed to Mr. Griffiths, the Chairman remarking, in putting it that he had read all the published dry formulæ, and had himself tried nearly all kinds of preservative substances, but the application of Mr. Griffiths's was, he believed, quite novel.

The thanks of the meeting to the Chairman concluded the business.

New members will be received at the next meeting of the Society, which is to take place on the 9th May.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

PRACTICE.

The recommendation of colouring from the life has been given with a good purpose, as you will see if you glance from the photograph to your sitter: and just listen to me for a few minutes.

Look first at the more luminous flesh tints of nature, and then at your photograph. With nothing but transparent colours, and upon nothing less brilliant than pure white, can these be imitated: of this be sure. The next luminous tints being harmoniously associated with the first, are still brilliant; but unless the tints indicating these in your photograph be of a very faint and not too cold a tone, your representation cannot approach the truth of nature. The exquisitely delicate and pearly demi-tints seen in the retiring and other portions of the face can never be obtained upon sooty grounds, if such happen to be the character of their photographic representatives: of this also be sure; and also that cold, opaque, and intensely black patches can never be made to represent the warm and transparent appearance of shadows. You will see, therefore, the importance of obtaining a properly printed proof. But the best photograph you can obtain for colouring will always degrade the character of your flesh tints more or less, especially those applied to shadows; and to overcome this difficulty one of two methods must be adopted, viz., the use of opaque colours, which absolutely destroy the photographic shadows altogether; or of the more powerful transparent and semi-transparent pigments, which only "kill" their objectionable qualities. Hence, too, you will easily understand that a scale of tints, colours, and shades will be required for photographic colouring entirely differing from those used in ordinary painting on ivory or cardboard.*

As you are about to begin by painting flesh, it is but fair that you should first study its character. So you look very earnestly upon your model.

The fair young creature cannot sustain your thoughtful but continued gaze, and down go her silken eyelashes, while up flushes the rosy blush. There is lesson No. 1 for you, viz., the transparency of the material. Now, do you think this transparent surface, so beautifully pencilled with the tender tracery of veins, and so eloquent of the flowing blood beneath, can ever be obtained by the use of pigments mixed with white? which, as Barnard justly says, would give you the appearance of "a woman who uses a cosmetic, and dusts her face all over with it, producing a mealy whiteness, which will never bear a close scrutiny." For this reason again I use transparent colours. But the lady, your model, feeling it ridiculous to blush under the gaze of an art-student examining her simply as he would a beautiful flower, an evening sky, or any other such charming piece of nature's handiwork, is now seized with a desire to laugh, and, raising her fan, presses it upon her lips to restrain the same, although the bright eyes (saucily asserting their independence of the mouth) are full of arch merriment none the less: and here is lesson No. 2 for you, viz., the solidity of the material.

The appearance of partial transparency and that of due solidity must therefore be properly blended, if you desire to obtain the real quality of flesh in your colouring.—[See Maxims 42, 39, 47, and 46.]

Observe, in the next place, the glossy surface of the skin, as evidence of its smoothness, and be sure you preserve this characteristic. Unless the lady be a sweetheart or wife, you must take the softness of this exquisite surface on faith only, otherwise an application of the essence of tulips would, as an old joke says, prove its existence.

* An otherwise excellent little work on miniature painting, recently published, falls into the error of recommending one process for both coloured drawings and photographs.

Turning again to your model, observe that where the bones are most visible under the skin the lights are whitest, but with somewhat of a pale yellowish tinge; that the delicate carnation of the cheek is not a smooth, even tint, but is full of inequalities and beautiful variety. Above all, note the effect given by the scarcely apparent down covering the skin, modifying the tones of the demi-tints, blending and harmonising the local colours, giving a peculiar softness to the outlines, and a bluish tinge to the retreating surfaces, which is very apparent. This down being so nearly white in a fair person, has much to do with the great delicacy of the face. You will perceive that where the pinky hue of the cheek nears the jaw this tint is broken with peach-like hues, violaceous and bluish greys, and greenish and warm demi-tints, melting into and emerging from one another with the same imperceptible gradations.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

A Grateful Pupil.—Yes.

Everard.—See reply to "An Impatient One," and that to "N. S." Lessons in the use of oil colours will be given.

Ann Page.—In consequence of the many applications which have reached me I am making arrangements to receive pupils, and when prepared to do so will announce the fact in the advertising portion of this Journal; at present I have not the necessary time. Your proposition of a class is a novel one.

A Dry Colourist.—Your coloured specimen puzzled me greatly; how you could have followed my instructions and produced such results I cannot guess. Begin again and be more careful, both in reading the instructions and carrying them out practically; and if you find the tints so difficult to mix obtain them already prepared.

J. Hope, Fendstone.—The flesh is too yellow; the blues too cold and pure; you have destroyed the folds of your drapery; the hair is a daub of opaque colour, owing to the destruction of the shadows. Why use the gold shell?—refer to my remarks on the subject. Never despair, though bad; many, with better opportunities, have done much worse.

An Impatient One.—I quite understand the difficulties you and others must experience in pursuing your studies from such small instalments given at comparatively long intervals; but the matter is not within my control, and doubtless our good friend, the Editor, makes such arrangements as he can to please the various tastes and fulfil all the wants and wishes of his numerous readers, although, for my own sake, perhaps it were better otherwise. Like most men, I am not insensible to praise, but am not prepared to swallow a compliment so palpably flattering as that in the contemporary to which you refer.

N. S., Brixton.—For professional purposes I would advise you to take courage and study water or oil painting. M. Mansion is the only really artistic colourist who produces satisfactory effects on paper with dry colours; and if you still desire to practise this branch, you could have no better teacher than this gentleman would prove. I do not think the powder colours are more easily mastered than water or oil. A *little* may be done with nearly equal ease in the one or the other, but to do more than simple tinting will, in either style, be found equally difficult. The remainder of your note I will answer privately.

G. Elder.—Verily there *is* room for improvement: certainly had I not read your note I never could have imagined "a professional *artist* desirous of improving his style" had coloured the specimen now before me. *Honestly* advising you, I say you had better throw aside your past experience altogether, take up the wholesome humility of a beginner, and choose a new road which *may* lead to something better, and cannot, at any rate, lead you to a much worse result. The specimens you have seen are mine, but I do not think so highly of them as you seem to do; and, by way of excuse for admitting thus much, must add that they were painted in great haste and under very disadvantageous circumstances by another gentleman and myself, and that I have not yet had an opportunity of putting better in their place.

G., Daintree.—I am much gratified to hear of your success, and must thank you for your kindly expressions. The unnatural prejudice in favour of foreign talent certainly does still exist among *photographers* in this country, but I think it is decaying. The peculiarity has been remarkable in England throughout the whole history of her art. In our earliest chronicles we find foreign artists high in court favour, while their superiors and equals, because "*English born*," were the victims of neglect and all its attendant miseries and bitterness. The origin of the defect you describe is either in varnishing before the colours were thoroughly hard, or in painting a second time before some of the pigments used in the first were dry enough. Wash the parts to be glazed with alcohol in warm water, and the glazings will then lie properly.

Calcium.—A new mode of preparing calcium consists in submitting a mixture of sodium, zinc, and chloride of calcium to a strong heat. The sodium combines with the chlorine, forming chloride of sodium, and the zinc remains mixed with the calcium. But as the zinc is volatised while the calcium remains fixed, they are separated by raising the temperature still higher, when the zinc passes off, leaving the calcium isolated. By this method specimens of calcium weighing twelve ounces and upwards have been obtained. It is probable that analogous metals, such as strontium, barium, &c., may be obtained by similar means.

Foreign Correspondence.

Paris, April 11, 1860.

The spontaneous decomposition of gun-cotton has been the cause of frequent accidents, some of them serious. To trace the causes of this decomposition, the attention of many chemists have been at various times directed. I recently noticed a communication from Mr. Hardwich, in which he gave it as his opinion that, among

the causes which change the constitution of gun-cotton, we must include even diffused light.

M. Davanne, the eminent chemist, disputes this conclusion of Mr. Hardwich's. He states that he has kept gun-gotton both in glass jars and lying open in paper on the shelf of his laboratory, in strong diffused light, for upwards of two years, without its undergoing any change whatever, still less a decomposition: it has even been submitted to a temperature of 100° Fahrenheit, and upwards, without any apparent alteration. From my own experience, I may venture to say that whenever gun-cotton has undergone decomposition in my keeping it has arisen from imperfect washing; if the pyroxyline was in the least degree acid, decomposition has generally supervened. I obviate this risk by the addition of a small quantity of bi-borate of soda, previous to the last washings, and I make the water flow into the washing vessel at the bottom, and overflow at the top; and after the cotton is drained, I take it while wet and squeeze out the remaining water into a measure, and test it for the presence of acid. Gun-cotton so treated I have kept five years, without its undergoing any apparent changes.

I regret very much to see by the report, in your last number, of the meeting of the North London Photographic Society, that MM. Davanne and Girard's researches on Positive Printing were decried. When we consider the vast amount of labour, skill, and patient research these accomplished chemists have given to perhaps the most important feature in photography — the permanence of positive pictures — it is but courtesy to receive whatever they put forth with some degree of consideration. But in the discussion at the North London Photographic Society's meeting, the objections made to certain statements put forth by MM. Davanne and Girard were taken on a wrong basis altogether — objections were made to statements which those chemists never put forth. While they fully admit the great solvent powers of hyposulphite of soda for chloride and nitrate of silver, they say that the double salt, hyposulphite of soda and silver, formed very soon saturates the hypo with that *double* salt, and, when so saturated, the hypo is no longer a *safe* fixing agent. There can be no disputing this — the evidence abounds on every side. Our portfolios teem with evidences of sulphur "fixing," which have a very suspicious, jaundiced aspect, due to questionable toning; and, instead of contradicting *the facts* those chemists have put forth, to the manifest benefit of photographic science, *I* think we ought to receive them gratefully.

At first sight there will, no doubt, be some reluctance on the part of photographers to accept so lavish a consumption of hypo as MM. Davanne and Girard's assertion would require; but it must not be overlooked that they also state that, when the hypo bath is saturated with chloride of sodium, the *double salt*, hyposulphite of soda and silver, becomes more stable, and the bath may be used with safety. Saturation with other salts, such as nitrate of potassa, phosphate of soda, bi-borate of soda, also induce greater stability in the hypo solution.

The importance of this "fixing" question cannot be overestimated, seeing that the permanence of positive proofs is the keystone of the whole photographic edifice. Experiments conducted by the light of science can alone lead us to safe practice: empiricism already abounds *ad nauseam*. J. P.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

IRON AND SYRUP FOR DEVELOPING.

To the Editor.

Sir,—I have been trying to develop wet plates with iron and a little honey syrup (made with honey in alcohol), thinking that as you suggest it for the dry process it might be the means of developing wet plates, and give sufficient intensity without using pyrogallic afterwards. I have, however, failed. Can I use the same iron developing bath twice or oftener without injuring the plates? Will bromo-iodised collodion retain its sensitiveness as long as cadmium collodion? Trusting you will excuse this string of questions.—I am, yours, &c.

R. GORDON.

[The amount of intensity obtainable by the proper use of a developer of iron and syrup is much greater than it appears to the eye. A bath should not be employed for wet plates, but a small quantity of the developer poured on to the plate, using a sufficient quantity of alcohol to make it flow readily without any pause in its course. The surplus may be poured off at once, and a small portion allowed to remain on to develop the picture. The same mixture is not fit for use a second time.

Bromo-iodised collodion can be made to keep sensitive for a very long time if judiciously prepared.—Ed.]

ALABASTRINE PHOTOGRAPHS.

To the Editor.

Sir,—I have made frequent attempts to manipulate the alabastrine process, but have generally been unsuccessful.

Although I have no difficulty in getting the pictures a good colour, as soon as I varnish them they invariably go quite black.

I have several bottles sold by Messrs. Squire & Co. for that purpose, and some made by myself from the formula given in the Journal, but each sample after the first use acts the same, and the varnish itself is quite black.

Will you be kind enough to inform me the cause of this in your next? I should be obliged if at the same time you could give me a good formula for printing glass transparencies.—I am, yours, &c. E. C.

April 4th, 1860.

[There must be some serious error in your manipulation which is not indicated in your communication; for though varnishing always detracts somewhat from the brilliancy of the pictures, there is no cause for blackening, unless indeed you omit to wash your proofs after using the re-developing solution, as it is called.

For printing glass transparencies there is perhaps no better plan than to use Fothergill plates, and print by direct contact.—Ed.]

CONJUGATE FOCI AND THE OPTICAL CENTRE.

To the Editor.

Sir,—Being desirous thoroughly to understand the valuable papers by Mr. Grubb in your few recent numbers, I had to refer to the best treatise at hand,—the "Useful Knowledge Society's" works on Optics and Optical Instruments.

Here I find the following rules:—

Rule 1. To find the conjugate focal distance: Multiply the focal distance of the lens by the distance of the object, and divide that product by the difference of those numbers.

On page 75 of your Journal, a case is assumed in which the conjugate foci are to be 8 (u) and 16 (v), and it is required to determine the focus (f) of a suitable lens. By the above rule we have $\frac{u \times f}{u - f} = v$, whence $uf = v(u - f) = vu - vf$, transposing and dividing, $f = \frac{vu}{v + u} = 5\frac{1}{3}$, as Mr. Grubb has given it.

Call $\frac{v}{u} = e$, the ratio of the foci, and which will also represent the amount of enlargement an image at the distance u would receive at v, we have $\frac{u \times f}{u - f} = eu$, whence $uf = eu^2 - euf$, or $eu^2 = (e + 1)\,uf$. Wherefore $u = \frac{e + 1}{e} \times f$; also as $v = eu$, $v = (e + 1) \times f$, which are Mr. Martin's formulæ, at page 65.

Rule 2. When two lenses are not in contact the compound focus is found thus:—Divide the product of the principal foci of the glasses by the sum minus the distance.

That is, the new focus or power $= \frac{F \times f}{F + f - d}$ Now the reciprocal of this is $\frac{1}{P} = \frac{F + f - d}{F \times f} = \frac{F}{Ff} + \frac{f - d}{Ff}$, whence in case (B), page 46, where $F = f$, we have Mr. Grubb's formula—

$$\frac{1}{P} = \frac{1}{f} + \frac{f - d}{f^2} = \frac{1}{f} + \left(\frac{1}{f} \times \frac{f - d}{f}\right)$$

Should Mr. Grubb, or any of your able correspondents, now supply a simple derivation of the above rules, and their application to case F, page 46, the whole subject would be thoroughly intelligible, I may say, to all your readers.—I am, yours, &c. C. L.

Leeds, April 6, 1860.

PHOTOGRAPHERS' HALF-HOLIDAY.

To the Editor.

Sir,—Perceiving that you are an advocate for the half-holiday, I beg your insertion of this note.

After reading in The British Journal of Photography your correspondent's letter, and your admirable remarks thereon, I decided that for two Saturday afternoons I would traverse the city and be my own witness as to whether any of the photographers had carried out your suggestion, when, what did I behold? Why, that the only establishment that was

closed (photographic I mean, as of course all the warehouses were closed) was that of a noted firm in Gracechurch Street, whose pictures few equal, and none surpass (I think that augurs favourably for the half-holiday); and I firmly believe that house suffers no pecuniary loss through its generosity to those in their employ. Your correspondent, while pleading for the half-holiday, remarks on the non-production of artistic pictures, in which he and I entirely agree, for, in my humble opinion, artistic photographs are conspicuous by their absence (if that is logical). Judging from this state of things, it leads one to think that what photography requires is either the importation of men with better talent and more artistic skill, or else that those who are at present practising it should have the opportunity of cultivating that love for artistic arrangement which is so essential for the production of artistic photographs. I prefer the latter course: let them have the opportunity to view the pictures of our great artists, and remark how beautifully the subjects are disposed. If they then make reference to their libraries, they will see that those artists did not obtain their grand ideas by remaining in-doors all the week, as it appears the photographic operator is expected to do, but that it was in foreign climes, and generally in sunny Italy, that those artists imbued their minds with the grand ideas which have enabled them to delineate, with such miraculous touches of the brush, those beautiful pictures which, had they never visited those foreign shores, would not have been there to gladden and enrapture our eyes. Now the operative photographer does not want three or four years in another clime to enable him to produce artistic photographs; all he requires is, that four or five hours on a Saturday should be awarded to him by his employers for the purpose of visiting those places of instruction and amusement which have been raised by his countrymen. I differ from you as to the day being of no consequence, as there are many places open on Saturdays which are not open on other days, or else there is an admittance fee. I would suggest that, as there is always in any place worth calling a photographer's, an operator and printer, that they might take it alternately where the means of the firm will not admit of closing, and I have no doubt that they would find that the men who enjoyed this privilege—that were in the habit of coming on Monday morning with a half-sluggish air—would then go to work with greater freshness and energy than they did when for six days, without cessation, their minds were depressed through constantly inhaling into their systems the fumes of injurious chemicals. I would ask any one who constantly works at photography, whether he does not suffer from headache and general debility, and loses that strength of mind which he possesses on a Monday morning, before the Saturday arrives, and if he does not look upon his profession as a living tomb? Of course it is a blank question for an operative photographer to think of a week's holiday. Instead of these dull thoughts haunting their minds, they would renew business with a stronger intellectual capacity and fresh ideas as to whether they could not, in their pictures, resemble this or that work of art which they had seen in their half-holiday rambles; and when a man thinks, the next thing he does is to act, and knowing this, I believe that the holiday would be productive of the most beneficial results to photography.

I hope to remain the trumpeter to a happy and pleasant season for photographers.—I am, yours, &c. J. HART.

COLLODION POSITIVES.

To the Editor.

Sir,—To bring our honourable art to perfection, it may, I think, be deemed necessary to unite three distinct accessories: chemical science, artistic taste, and expertness of manipulation. Of the first and second it is not my design at present to treat. But having had nearly six years' constant practice as a successful photographer, my experience may be of use to some of your amateur shadow-catching subscribers.

In my conversations with many photographers, and in the perusal of photographic publications, I have observed that the tendency has generally leaned to the chemical and artistic departments, and that aids have been sought from those which belonged almost entirely to the manipulatory. Bad collodion, disordered baths, and suspected developers have been, and still are, the general scapegoats of erroneous manipulation. I have frequently known the various chemicals denounced as unfit for use that were everything that could be desired; indeed, for my own part, I am so fortunate as never to meet with any bad chemicals; and though I attribute general failures to imperfect manipulation, and have often redeemed the character of condemned chemicals by using them in a proper manner, my own mode of manipulation to the chemical fraternity may perhaps be deemed execrable; nevertheless, it is successful, and that is the clenching argument.

I have observed an almost incredible amount of failures caused by the imperfect cleaning of the glass, which, in my practice, is an exceedingly simple and infallible process. It is this:—I make a saturated solution of common washing soda with boiling water, and while it is hot put in the glass, rub each plate with a rag, and let it remain there till wanted; then I wash off the soda, and rub it over with diluted nitric acid, about four parts water, wipe dry with a towel washed in soda without soap, and polish with a wash leather.

It appears to me that a great deal of nonsense is talked and written about the silver bath. My plan is this:—I make a thirty-grain solution either with distilled water or tap water, in the latter of which I previously put about two drops of nitric acid to the quart. It appears to be immaterial which is used, for I find them to answer equally well. And I may observe, for the over-exact in chemistry, that water and nitrate of silver are its only constituents; I use no iodising, or neutralising, or acidifying, or modifying process whatever, nor do I find any required. I often see it stated, too, that the bath gets weaker with use, and that it is necessary to restore it by adding silver, or replenishing with a stronger solution. But whatever theorists may say, I do not find this perceptible in practice. I am now working with a bath upwards of two years old, that is, I have not had an entire new one for that length of time, but have uniformly replenished, as waste required, with a thirty-grain solution; I have taken thousands of pictures with it, and I can assure you it is still faultless. All that I do with it is to filter when muddy, which occurs perhaps once in two or three weeks. I keep it in an open bath-trough in my dark room, without any particular protection either from light or dust.

I am often amused when I read or hear of the endless kinds and qualities and comparative merits and stages of change of collodion. Let it be only of ordinary make, without regard to any peculiar quality, or of any age, and it will do for me. I can take with it pictures either foggy or transparent, yellow or white, perfect in half-tone or imperfect, flat or prominent, dingy or brilliant, metallic or soft, merely by varying the manipulation. And as for the notion that collodion is best when fresh made, I am satisfied it is false. I seldom use any new; I keep a stock-bottle half full or upwards, into which I mix all fresh supplies, and pour off as required. It is deep in colour, almost like treacle. I put in all residues, and collodion of anybody's make, and whether positive or negative, all goes to one pot. And it will also answer for thick films to be transferred to leather, &c., as well as if made for the purpose. I have even had phials of collodion that have had the stoppers out, and been neglected for months together, till all the liquid had evaporated, leaving behind a hard solid mass, and yet it would be perfectly workable when added to the stock-bottle, and thinned with ether. And I never have any either wasted or of inferior quality.

My developer is a twelve-grain solution of protosulphate of iron, with four ounces of spirit to the gallon, and two ounces of dilute nitric acid, made by putting four ounces of the acid into a twenty-ounce bottle, and filling up with water. I put the acid solution into the water some hours *before the iron*, which appears to have a beneficial effect upon the developer. I keep it in unstopped bottles in all weathers, and develop with a glass measure, crusted thick both inside and out with sediment, &c., not washing it perhaps for three months together; and although it is said that iron developers will not keep, I have found by experience that the one I use will keep for six months, without any signs of deterioration. While I now write a photographer from a neighbouring town has dropped in, and expresses his sorrow that he cannot make an iron developer to keep.

I "fix" in an upright trough with a saturated solution of hyposulphite of soda, and filter when necessary. I never change it wholly, but replenish by adding new to the old.

You will thus see that my method is the most simple, the quickest, the least expensive, and requires the least care possible, and I may also add, that it is so certain in its results that I seldom have a failure from any cause, except in misjudging of the light. O that somebody could invent an actinometer! I can prescribe but few general rules, but I would say—

1. Keep the chemicals clean.
2. Do not mix any of the chemicals by carelessness.
3. Let the plate remain in the bath till thoroughly iodised, but no longer.
4. Learn to judge when a picture has been properly lighted.
5. Ascertain the maximum and minimum power of the developer, and *develop by time*, for I find that time is of as much importance in developing as in the camera.
6. Keep the temperature above 50°.
7. Let the whole process be gone through as quickly as possible, and it must be remembered that what delivery is in oratory, so is manipulation in photography.

No doubt some of your scientific readers will demur to this unscientific letter, but I would remind them that a process must be judged by its results, and that the public have pronounced their judgment in favour of the method here submitted.

I don't know whether I am more fortunate than other photographers in procuring pure chemicals, but I have always been supplied by the firm of Harvey, Reynolds, and Fowler, of Leeds, one article excepted. For the last eighteen months or so, I have mostly used Hanson's collodion, on account of the lowness of the price, being the cheapest I have met with, and answers the purpose quite as well as the dearest.

Having written a longer letter than I intended, I will now conclude with the remark, that it is my impression that more careful attention to manipulation will generally prevent the failures attributed to bad chemicals.—I am, yours, &c.

March 7, 1860. ISRAEL HOLDSWORTH.

[We like exceedingly to look at all sides of a question, and are at all times happy to afford correspondents an opportunity of expressing their opinions upon matters photographic, hence the insertion of the preceding letter. We may, however, be permitted to repudiate anything like concurrence in the views therein expressed. Any further comment we shall leave to our correspondents.—Ed.]

THE CENTRAL SPOT.—THOROUGH WASHING.

To the Editor.

Sir,—Allow me to offer you another explanation of the cause of the "foggy-looking spot" in the centre of negatives, which you speak of in your last leader. I was at one time very much annoyed by this defect when taking views with the front lens of a portrait combination, and was for some time unable to find out the cause. At last I discovered that it was produced by the reflection of light from the interior surface of the lens tube, which though blackened, as usual, was still capable, from its smoothness, of reflecting a considerable amount of light. I therefore lined the tube with black paper, quite free from glaze, which completely obviated the difficulty, so that I was never troubled with the spot again.

With all due deference to your judgment, I cannot help thinking your explanation very unsatisfactory. I cannot at all see how the external shade can be the cause, and the admission of the oblique rays by its removal could only aggravate the defect, if indeed it did not also produce fogging over the whole picture.

I am obliged to Mr. Hardwich for his remarks on my last communication. The object of washing the plates in a *measured* quantity of water was to obtain uniformity in sensitiveness, by leaving a definite proportion of free nitrate of silver in the film. The degree of sensitiveness seems to depend to a great extent upon the quantity of free nitrate remaining. Pure iodide of silver is totally insensible to the influence of light; for iodised calotype paper may be exposed to the direct rays of the sun for hours without injury, and a collodion plate would be equally insensitive if the nitrate were *entirely* removed. I believe, however, that it is impossible to remove the free nitrate *completely* from a collodion film by any ordinary amount of washing, and that the most thoroughly washed plate still owes its sensibility to the small quantity of nitrate still remaining, and perhaps also to a portion of chloride which will be formed if common water be used for the washing. It seems now to be considered that free nitrate may be replaced by chloride or other insoluble salt of silver, without impairing the sensitiveness of the plate. I must own I was somewhat incredulous as to the truth of this statement when it first appeared, and have not yet had an opportunity of satisfying myself by experiment, but it seems now to be generally admitted as a fact. If this substitution should prove practicable, it will probably increase the keeping capabilities of the prepared plates. As soon as I am able to resume my photographic pursuits I shall give Mr. Hardwich's suggestions a fair trial.—I am, yours, &c.

April 5th, 1860. R. W. FORSTER.

[It is clear that our correspondent has quite misunderstood our remarks. If he will refer to the article he will perceive that our allusion was to a *double* combination with a *central* stop; moreover, we also used the following words:—"The only precaution to observe would be, to be quite certain that the interior of the tube is properly coated with *a dead black substance of an appropriate kind.*" The external shade, if too long, or of too small a diameter, cuts off a part of the effective aperture for oblique rays, and thus causes the edges of the picture to be less intense than the centre: he has only to try the experiment to be convinced of this fact. If the interior of the tube be non-reflective no inconvenience from the absence of a shade will be found.

We are by no means satisfied of the correctness of the oft-repeated assertion, that "pure iodide of silver is totally insensible to the influence of light." The case cited proves nothing of the kind, but simply that calotype paper exposed to sunlight can, *by subsequent treatment*, be rendered effective for receiving an impression. We have good reason to believe that pure iodide of silver *is* sensitive to light. We are certain that the presence of free nitrate of silver is not an essential condition to the existence of this quality, and we do not admit that there is any question as to the practicability of substituting for the nitrate a chloride or other insoluble salt of silver. This is a *fact* which we have personally verified repeatedly, and, what is more, the practice is pretty commonly followed at the present time.—Ed.]

INTENSIFYING A NEGATIVE.

To the Editor.

Sir,—Will you favour me by replying, through the medium of your valuable Journal, to the following questions?

I am now developing my negatives with iron, but I cannot intensify them enough to get good positive prints from them. The iron developer I use is composed of fifteen grains protosulphate of iron, fifteen minims glacial acetic acid, and four ounces of water. I then clean them off with cyanide of potassium, &c., and try to intensify with the following: six grains of pyrogallic acid, thirty minims of glacial acetic acid, thirty minims of alcohol, and eight ounces of water: I make this quantity for convenience. The result—*fog.*

Should the negative be cleaned off with cyanide before intensifying, or merely washed well with water, then intensified, and, last of all, cyanided in the usual way?—I am, yours, &c. LYON.

[Your iron developer is too weak to "flash out" your picture in a few seconds of time, and by keeping it on too long, of course, the result is—*fog.* Use *one* ounce of *distilled* water instead of the four at present employed; keep it (the iron developer) on the plate as short a time as possible, then proceed as before, but omit the alcohol with the pyrogallic developer, with which, however, you must of course use a few drops of nitrate of silver solution. You may intensify either after or before clearing, but we prefer after. A thin fluid collodion is not so well adapted for use this way as one thas has more body.—Ed.]

A REAL BLESSING TO MOTHERS!—PURPLE VELVET AND PURE CALOMEL.

To the Editor.

Sir,—Hoping you are well as this leaves us at present I takes up my pen in hopes you will exquse the libarty I takes in addressin of you unbenone to you as I am. But a fond mother's feelinks must have went. I am a pore widow letting lodgings and a large family seven living and two berried thanks be at a small watering place. My eldest boy plows the briny wave as he sings when he comes home and my youngest is a golding aired angle of six come fust of May. It is of these two that the mother's 'art must speak. When last my boy was at home he went to a "portraitist" "a poor professional" "who has talent and patience" the two pair back's brother who helps him on Sundays and had his likeness took in a splendid frame with the mole on his cheek and his turnup nose with a little ring to hang it up by quite natral for a shilling. "Mother" says he "this aint a common sixpenny touch but a Albastrine Photograph" readin from a label on the back quite proud like. "Well my boy" says I "it is a good likeness and I vally it whatever they calls it." Thinks I to myself "Alabastrine indeed" "that's a bit of Bunkum" as my diseased husband used to say. To make a long story short last Sunday my youngest who is sometimes a ailin' as youngests of nine often does as other mothers as well as me can testerfy, well Sir as I was sayin she had been up in the two pair back's bedroom a lookin at the ships when down she comes with a paper in her hand. "Polly" says I "you norty child how dare you touch the lodgers things." "Taint no use mother" says she "I found it in the grate." Well thinks I it cant be of much use then. With that I takes it out of her hand and begins to read it thinking it might be "Reynoldses" or somethink that way. So I reads "Photographic Quæries" By Thomas Epsom BA of Alderney. Oh thinks I you are all about acids and vitrol and stuff for the two pair back's shirts is stained awful with the vitrol he uses and I was just agoin to shove it under the kittle to make it bile when the words "Alabastrine Process" kitches my I. Ah thinks I more Bunkum and I read and on all about "portraitists" and "shimmer" and "purple velvet" and "calomel." Only to think that the shadders of my boy's coat was purple velvet and that the mole on his cheek and his turnup nose was "pure calomel." I quite larfed I did indeed. Three hours later when all the shops was shet and I had nobody to send if they wasnt for the others had gone to Sunday School and I was alone with my golding aired dear. I had kep her at home as she fell porely and sickish like. Well Sir she got wus and wus till she was that bad that I thought she would prespire in my arms. Oh thinks I if I only had some calomel—calomel's the only thing for you and there's nobody to send and the shops is shet if there was. I kast my ise around in disparc when kitching site of my boy's likeness it flashed across me and I come all over like. "The lights is pure calomel!" It was done in the twinkling of a bed-post though I felt like Isaac sakrifijing his son Abel—my golding aired darling had swallered her brother's 'ed fase shirt front one of his 'ands and the pillar and curting. The effex was magik. In half an hour it had acted—you are a father Sir no doubt and I need not explain—it acted and by the time the others had come she was a sleepin the sleep of the innercent in her little bed and the frame was 'anging again on its nail with only my boy's neeze, one 'and, and the legs of the cheer showin'. But what odds the rest of the picture is purple velvet. "Can anything be more beautiful?" "If it can, take away the velvet and put it there instead." This last and a good deal more is agstracted from the "Quæries," so if there is any bad spellin or anythink you can't understand it is Mr. Epsomses fault not mine.

Aksin your parding for being so gossipin like.—I am, yours, &c.

PENELOPE ANN SPRIGGINS.

ANSWERS TO CORRESPONDENTS.

Mercator.—A little more citric acid is all that you require.

A. N. Scott.—The stereographs have at length come to hand.

A. Y. V.—H. B. C.—R. T. Dick—An Amateur: answers to these in our next.

J. L. Fysh.—The index and title page to our last volume was issued, as promised, with the number published on the 15th January last. We cannot understand how it is possible for you not to have received it.

F. Fordham.—We know of nothing so convenient for your purpose as the washing tray, or rather *slop* tray, introduced by Messrs Murray and Heath for use in Smartt's tent. It consists of a waterproof material, kept in form by a light wooden frame, which takes to pieces and allows of the tray being rolled up; a flexible tube from one corner carries away the washings, &c., into any vessel placed to receive it. You may, with one of these trays, readily develop negatives on glass in the hotel bedroom without running any risk of having to pay for spoilt table covers, &c.—that is, unless you are very clumsy.

Received.—C. B., H. E. Roscoe, with thanks.

☞ Notwithstanding the increased size of the present number, several communications already in type are unavoidably postponed.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 117, Vol. VII.—MAY 1, 1860.

It is not a little amusing, as well as instructive, to take an occasional retrospective glance at the state of our art, in its various ramifications, as it existed some few years back. It is not only that we become aware of the enormous rapidity of its development by so doing, but we cannot fail to be struck with the vast amount of change, both in opinion and practice, that has occurred in a comparatively short space of time. What, for instance, can be more different in its present and past conditions than the process of printing positives upon paper? How simple in its early days! — how complex in its present manipulations! Then, we were content, it is true, with a sketchy affair, of a vile brick-red hue, as if "knocked off" in a hasty way with a piece of red chalk; now we are particular, and must have our rich purple or black tones, with every gradation of half-tone preserved in the utmost perfection. The trouble of producing the former was next to nothing — which is about the value of such a print—while the latter is not to be acquired without a considerable amount of labour; but then it is really worth something. As the mansion is a development of the original mud hovel, so is the positive printing of to-day the natural sequence of that of yesterday. The present condition of things has not been arrived at, however, by mere empiricism, but depends upon the results of careful and well-directed investigations; often entered upon, it may be, from some chance observation, but entered upon designedly, and in order to clear up what has appeared anomalous or obscure.

We have been led to these remarks after perusing a paper upon this subject, read at a recent meeting of the Manchester Photographic Society, by Mr. W. T. Mabley (a portion of which appeared in our last issue, the remainder being given in the present number); and, as it is one of interest to every photographer, we propose drawing attention to a few of the points specially treated of in the communication to which we have alluded.

We think it but an act of justice to remark, *en passant*, that there is perhaps no photographic society — certainly no provincial one — that exhibits a greater amount of active vitality than that at Manchester; and the chairman who presided on the occasion when the paper by Mr. Mabley was read, was altogether too modest in his estimate when he remarked upon its position as being *likely* to be second to none — a position he might at the time have justly claimed for it.

In perusing Mr. Mabley's paper, the first thing that strikes us is the probability that this gentleman is unacquainted with the researches of MM. Davanne and Girard upon the subject of positive printing, as he states that it has appeared to him "that several matters which might or might not be of importance have never been practically and systematically examined," and then cites the condition of the nitrate bath as an instance. Now, a very systematic investigation has been executed by the gentlemen named; but we are of opinion that similar researches by a competent and independent experimentalist are imperatively called for, as there are several conclusions at which our French brethren have arrived which appear to us not necessarily to follow from data furnished by their own experiments. It is not altogether improbable that investigations under somewhat altered conditions may lead to different results as a foundation for theorising.

We are convinced, from the earnest manner in which Mr. Mabley has entered into what is evidently a labour of love, that he will not regard our comments in any other light than as an attempt to elucidate one or two points, by drawing his attention to some obscurities in his communication — obscurities that probably did not exist to those who were present at the reading of the paper. He states that the negatives employed in his experiments were made by causing "light to pass through strips of paper of different degrees of transparency." Query—Did he use paper negatives? or were the slips of paper used wherewith to produce a glass negative?

We next notice that the attention of the author was directed towards the *sensitiveness* of prepared papers; but, on reading further, we are by no means assured that he means thereby what is generally understood by sensitiveness—that is, aptitude to receive an impression *rapidly*, and not the capability of darkening by a sufficient exposure to any required degree of intensity, which is what we gather from the paper as being Mr. Mabley's meaning of the term. It is, of course, but of trifling importance which definition he employs, but highly necessary that we should understand in which sense it is used; and we trust that Mr. Mabley will in his next communication indicate the same. If we have wrongly interpreted the meaning attached by him to the term, then his experience somewhat differs from that of the French operators, who found that either an acid or an alkali added to the neutral nitrate of silver bath retarded the darkening action of light upon chloride paper, in which albumen was absent; but these may possibly not be opposed conclusions, the presence or absence of the organic body varying the primary conditions of the experiment.

It is suggested that albumenised paper should be stamped by the makers, so as to indicate the quantity and kind of chloride used in its preparation — a very useful hint to follow out: there is, however, already one firm which supplies the information, though not in the manner above named.

Mr. Mabley tried the difference of effect produced by printing through a piece of thick plate-glass, and also by omitting the same, and estimates the retardation of the former at about twenty to thirty per cent. in time — a much greater difference than we were prepared to expect, though we do not attach so much importance to it as the author of the paper himself does.

There is one experiment in particular which has a very useful practical bearing: it shows that papers prepared upon a faintly acid (nitric) bath tone more rapidly than those from neutral or alkaline ones, and that we thus have a probable means of overcoming the difficulty of toning which some papers possess. But this is not all. It is well known that albumenised paper, sensitised upon an acid bath, will "keep" in ordinary circumstances much longer without becoming discoloured than if prepared upon a neutral bath, so that two important advantages are attained by the same proceeding.

A piece of sensitised paper, kept for six months in one of M. Marion's preservative cases, was not found, although highly sensitive and but little discoloured, to tone properly; but we do not think any satisfactory conclusion can be drawn from this experiment, because neither the amount of chloride employed nor the condition of the sensitising bath were known to the operator.

Our object in making the preceding observations has been, not for the purpose of opposing the conclusions arrived at, but solely with a view to directing attention more pointedly to them, and to eliciting, if possible, from the author of the paper a few explanatory words relative to some passages which we consider are at present open to misconception.

We shall look forward with considerable interest to the continuation of the subject as promised.

A CALUMNY REFUTED.

[As a rule we are averse to admitting anything like personal controversy into our columns: it is, however, generally admitted that there are exceptions to every rule, and certainly this is one of them. Mr. Grubb has been assailed in consequence of his contributions to this Journal; we therefore consider that he has a right to claim the insertion of the following correspondence.—Ed.]

To the Editor.

Sir,—It is matter of no surprise that the projector of the new panoramic lens should feel excessively galled at the result of the late discussion in London (as published in all the Photographic Journals but his own) on that production, which, in his eyes, was destined to eclipse all other lenses in photography. But, I am by no means content, nor shall I quietly submit, to be constituted the "scape-goat" on which the disappointed projector shall unscrupulously wreak his resentment or vent his spleen. I have contributed but a very small share towards the general condemnation of the lens. I only showed what kind of projection it would give, leaving it to others to approve or disapprove of the same; and no one has need to be more dissatisfied with that projection than the aforesaid projector, inasmuch as he has for a long time past been crying out against using a lens having (or giving) any distortion at all, while *his panoramic lens produces a picture which, when flattened out, trebles the distortion created by any previous lens extant.* It will be within the recollection of, perhaps, not a few of your readers, that, some years since, I was placed in the unpleasant position of having to defend myself from a very impertinent and groundless attack of the projector of the panoramic lens, and who, subsequently to the time alluded to, became editor of a photographic serial. The pages of the *Journal of the Photographic Society* are evidence as to whether I conducted my defence in a becoming manner. There are, however, persons who, once discomfited, will carry their resentment down to the grave. A considerable time (I think about two years) passed, during which I purposely and studiously avoided everything which could in any way interrupt a return to good feeling, but which time, I regret to say, was employed in an opposite way by the said editor. I avoided looking into his publication until repeatedly urged to do so. At length, seeing that it contained matter against me of a libellous character, I wrote a note to the editor, and received a characteristic reply. In addition to which I have lately received another letter of the same stamp from the same party, which he has published nearly *verbatim* in his journal of the 15th January. This last production I am not alone in considering at once impertinent and threatening. Its impertinence is beneath my notice, and *its threat I meet* by requesting you to publish those letters which the said editor insinuates that I would desire not to have published. If I had any such desire, it was on his account, not on my own. The correspondence is as follows:—

[Copy.]

No. 1.—Mr. Grubb to Mr. Sutton.

No. 15, *Leinster Square, Rathmines, Dublin, Oct.* 27, 1859.

Sir,—A friend of mine having lately sent me a number of your publication, dated August 15, 1859, I find at page 204 of same the following words:—"Every one knows, except Mr. Grubb, of Dublin," &c. Now, sir, I feel fully justified in calling upon you as the editor of said *Photographic Notes*, to inform me, firstly, whether I am, or am not, *the* Mr. Grubb alluded to in the above-quoted passage? And, if I be, then, secondly, on what grounds you have, after a perfectly unnecessary mention of my name, held me up to public view in your publication, in a manner libellous in itself, and which, if true, would make me unfitted for the responsible situation I hold as Engineer to the Bank of Ireland.

I enclose a stamp, and shall make such use of your reply or silence (as the case may be) as I think fitting.

I am, Sir,

(Signed) Thomas Grubb.

To Mr. Thomas Sutton, St. Brelade, Jersey.

No. 2.—Mr. Sutton to Mr. Grubb.

St. Brelade, Jersey, Oct. 29, 1859.

Mr. Thomas Grubb,

Sir,—I hasten to reply to your note of Oct. 27th.

1st, *You* are the Mr. Grubb to whom I alluded in my *Notes* of August 15th.

2nd, The grounds on which I have "held you up," &c., are these:—I said, in *Notes* of August 15th, "Everybody knows (except Mr. Grubb, of Dublin) that a large single view lens, with a stop in front, gives more distortion of the marginal objects of the picture than any other optical arrangement which could be devised." And I now repeat that everybody, except yourself, knows this; for you say in your advertisement that "the aplanatic lens gives far less distortion of the image than the ordinary view lens;" while everybody knows that your aplanatic lens is in its external form, size, and position of the stop, identical with an ordinary single achromatic view lens, and that the distortion which it gives is precisely the same. Everybody, I say, must know this, except yourself apparently.

If you require *proof* that your aplanatic lens gives considerable distortion of the image, here it is:—

First, Your lens was tried by a committee of the Photographic Society of Scotland, and in their report they state that the vertical lines on the margin of the picture are bent inwards at their extremities.

Secondly, I inclose you a print which I received a day or two ago, from a negative taken by a distinguished professional photographer, whose name and address are written upon the back, and in reply to my query, addressed to him, as to what lens he used to produce so much curvature of the column at the left hand side of the picture, he said, "These views of ——, where the pillars are crooked, were taken with a pair of Grubb's aplanatic lenses, and I was very much disappointed with their working." I quote from his letter, which is now before me.

The above statements take the question out of the region of interminable talk into that of fact.

But I don't see how all this affects your position as Engineer to the Bank of Ireland. If you patent a lens, and advertise it, and sell it, and a professional photographer buys it, and takes pictures with it, and sells them, and expresses an unfavourable opinion of the lens, he has a right to do so; and if the editor of a journal, or a lens committee, describes your patented lens, and discusses its theory, and pronounces it faulty,—all that is perfectly fair and lawful; but I do not see how it affects your position as Engineer to the Bank of Ireland. I advise you to take a less serious view of the matter. Surely the directors of that bank could not think less highly of your engineering abilities from your having made a slip in optics. Take comfort, then. Your tenure of the responsible and no doubt arduous office which you hold as Engineer to the Bank, cannot surely depend on your knowledge of optics.

Pray make any use you please of this letter, as I shall do of yours. And if you think my statements contain anything libellous I inclose you the address of my solicitor.—I am, Sir, your obedient servant,

THOMAS SUTTON.

P.S.—Since the professional photographer whose print I inclose takes quite as high a standing in photography as Mr. Bedford, you will no doubt think it only fair to the public to add his remarks on the working of your lens to the other statements contained in your advertisement.

Be good enough to observe that you have provoked this reply from me by your absurd letter.

The address of my solicitor is—Mr. Evans, English Solicitor, King Street, St. Helier's, Jersey.

In conclusion, I have merely to add that, having shown the above correspondence to several persons, they have agreed with me in considering my note as a straightforward letter of business, with which there is, under the circumstances, no fault to be found, and the letter I received in reply, to be an addition of impertinence, if not of insult, to injury; while that which the said editor, in his lately-published production, is pleased to call his "good-natured forbearance"(!)—(subsisting, it should be observed, under a threat)—is esteemed by myself and others as a crowning cap of *unwarrantable effrontery.*—I am, &c.

THOMAS GRUBB.

Dublin, April 24, 1860.

ON THE REACTION OF CHLORIDE OF SILVER UPON THE HYPOSULPHITE OF SODA.

By George Dawson.

[Read at the Meeting of the North London Photographic Society, April 25, 1860.]

At our last meeting I hastily (and, I fear, rather imperfectly) reported the result of an experiment I had undertaken for the purpose of disproving a statement respecting the solvent powers of hypo upon Ag. Cl. I had not, at the time of my making that communication to you, been able to obtain a report of the *modus operandi* by which MM. Davanne and Girard had arrived at their rather startling conclusions. It was in the hope—vain as it turned out to be — of my obtaining this report that I deferred the experiment, already before you, to the last moment. Such as it was, it dealt directly with the question at issue, and, as you are now aware, was strikingly in accordance with the views of one of the most eminent chemists of the present day,— Mr. Hardwich.

Having now carefully perused the, in some respects, valuable paper of MM. Davanne and Girard, and tested their experiments, I venture to submit that their conclusions are not warranted by the facts of the case. They assert that "if we take a quart of a solution of hypo, of the strength of ten per cent., and stir into it forty grains of freshly-precipitated chloride of silver, the latter will be dissolved, and form the normally saturated solution spoken of above."

Further, as to the practical bearing of this, they remark:—"Now, we know that a whole sheet of paper contains, after sensitising, about twenty-seven grains Ag. Cl. only; therefore, when a sheet and a-half, previously freed from nitrate by washing in water, is passed into a bath containing a quart of hypo solution of the strength of 10 per 100, the bath will be saturated with this double salt."

In support of this assertion they adduce the following experiment, and this only. I go on to quote:—"In placing a solution of hyposulphite of soda of 10 per 100 in contact with a great excess of recently-precipitated chloride of silver, filtering the liquor and abandoning it to repose, we recognise at the expiration of a very short time that a strong proportion of double salt is deposited in the crystalline state, very pure and white. If we then seek to determine the richness of this liquor, which does not alter when exposed to the air, and which must be considered as corresponding to the saturation of the hyposulphite by the double salt, we recognise with astonishment that this solution does not contain at 60° F. more than 27 grains of silver in every litre (35 ounces), which corresponds to 36 grains of chloride of silver to 25 drachms of new hyposulphite."

They have selected a rather weak solution of hypo, viz., ten per cent. This, however, is not of much importance in the present inquiry, inasmuch as I could scarcely find any appreciable difference in the relative quantity of Ag. Cl. taken up by a ten per cent. and a forty per cent. solution to reach the point of supersaturation,— the only difference being greater rapidity of action on the part of the stronger solution; but in both an increase of temperature in the operating-room increased in a corresponding degree the rapidity of their action.

I may as well note here some facts which will save me the trouble of considerable repetition hereafter. During the progress of the following experiments the temperature of the room varied from 40° to 65° F. In every solution test paper was placed, and when any acid reaction showed itself the fact will be mentioned. The Ag. Cl. was freshly precipitated by Na. Cl., washed, dried, and added to the hypo in small quantities. Both the hypo and the Ag. No_5 were of good but not pure quality — the solvent for the former being ordinary spring water.

Having made, then, several solutions of ten per cent. hypo, I dissolved in one set of these Ag. Cl. in the proportion of one by weight to three hypo crystals. This class, for want of a better name, I shall call Test Solution No. 1.

In another set I dissolved rather more than ½ Ag. Cl. Test Solution No. 2.

In a third set Ag. Cl. was added till the white crystalline precipitate fell abundantly.

This was probably Herschell's second salt, consisting of one equivalent of hyposulphite of silver with one of hyposulphite of soda. $Ag\,O, S_2\,O_2 + Na\,O, S_2\,O_2$. Test Solution No. 3.

The behaviour of these sets of solutions, under the tests to which I subjected them, was as follows:—

Test Solution No. 1 (*a*) by evaporation yielded a crop of brilliant, clean, cut crystals, very soluble in water, in fresh hypo, and also in a portion of its own liquor removed before evaporation.

(*b*) In another portion of No. 1, no precipitate of any kind showed itself at the expiration of three weeks, although exposed to the air. I then fixed with it a positive stereograph on paper, which certainly bears all the characteristics of perfect fixation, and stands a severe test for the presence of sulphur and sulphides, by not giving off the unmistakeable smell of sulphurous acid when heated.

Test Solution No. 2 on evaporation yielded the same sort of crystals as No. 1; a little more defined and brilliant (perhaps an accidental circumstance), also soluble in water, and in other respects comporting itself in a manner precisely similar to No. 1.

Test Solution No. 3, (*a*) the precipitate insoluble in water, but perfectly soluble in its white state in fresh hypo; this new solution again on evaporation yielding crystals similar to Nos. 1 and 2, soluble in water. (*b*) The precipitate on a sand bath at about 180° Fah., quickly resolved itself into sulphide of silver, going through the regular gradations from white to yellow (at which stage it ceases to be soluble in hypo), brown, and black. (*c*) The instability of No. 3 manifested itself when exposed along with its supernatant liquor for a few days to the air. Symptoms of acidity at the end of that time showed themselves, the $Ag\,O, S_2\,O_2$ being gradually decomposed into $Ag\,S + S\,O_3$; but this solution was standing in a warm position. On the other hand, another similar solution has remained without any symptoms of decomposition, in a pretty even temperature under 60° more than a fortnight.

I shall not trouble you with listening to further details. Those already stated are only a small portion of what I have collected, all tending to the same end. Enough has been mentioned to show that Ag. Cl. in hyposulphite of soda exhibits no tendency to crystalise nor to decompose, until one part by weight of the former has been added to two of the latter salt: a broad enough margin will be left for impure materials if we say one to three. You will observe I have carefully kept out of view the influence of Ag. Cl. decomposed by light, of the organic and argento-organic compounds, all which in practice may, and probably do, modify the results. Other causes, we know, greatly affect the stability of a hypo bath in *any* stage of its progress towards saturation, such as the presence of acids, nitrate of silver, and so forth. Any one who tolerates the presence of this latter class where they have no business to be, will be amply repaid in faded proofs and much vexation. It is not my intention nor object at the present time to enter into the conditions of a stable bath, and discuss its disturbing causes. These have nothing to do with the question at issue between MM. Davanne and Girard and ourselves. They make a clear and distinct statement, and found it entirely on what I consider a fallacious experiment. They throw in a large excess of Ag. Cl. into a ten per cent. solution of hypo and filter the liquid, in which they find only a very few grains of silver. I have not yet finished my repetition of this experiment; but I have gone far enough in their direction and in my own to induce me to believe that I have found out the source of their fallacy. The facts I have as yet ascertained are these:—

I saturated a ten per cent. solution of hypo with Ag. Cl., and continued adding the latter till hyposulphite of silver ceased to fall. Part of the liquor was boiled in a test tube, without the expected deposit of Ag. S. It then occurred to me that, if this body were absent, it might contain chloride of sodium only; and this surmise seems to be borne out by the few tests I have as yet had time to apply. They are as under:—

Nitrate of silver produced a copious precipitate of Ag. Cl., with all its characteristic properties.

Sulphuric acid — a slight milkiness.

Nitric acid — the same.

Hydrochloric acid — no effect.

On evaporation, a crystalline residue appeared in considerable quantity, of a saline taste, and quite soluble in water. A piece of paper dipped in it, dried, and floated on nitrate of silver, was very sensitive to light. [Print exhibited.]

Should these strong indications lead to the proof that my surmises are correct, it would not, I think, be great heresy to doubt the existence of Sir John Herschell's second salt as the highest combination of hyposulphite of soda with chloride of silver. The formula then would be, not $Ag.\,Cl. + Na\,O, S_2\,O_2 = Ag\,O, S_2\,O_2 + Na\,O, S_2\,O_2$, but $Ag.\,Cl. + Na\,O, S_2\,O_2 = Ag\,O, S_2\,O_2 +$ Na. Cl. left in solution. The existence of the first salt, also, viz., $Ag\,O, S_2\,O_2 + 2\,(Na\,O, S_2\,O_2)$, as a distinct body, would thus also be highly problematical, inasmuch as it would only represent a certain stage on the road towards the formation of the higher salt. Certainly it has no existence in the sense in which MM. Davanne and Girard describe it, viz., as a salt prone to crystallise and decompose in the presence of hypo and water.

According, then, to this supposition, had MM. Davanne and Girard thrown in a little more Ag. Cl. into their ten per cent. solution of hypo, the probability is, the result of their analysis would have shown a still smaller per centage of silver remaining in the liquor—in truth, only the small quantity dissolved by the Na. Cl. in solution.

I have thrown out these remarks merely as suggestions, naturally arising from the unexpected phenomena of my concluding experiment. It is to be hoped some able chemist will take up the subject, and thoroughly investigate and settle this important and difficult question.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 3.

On re-perusing my last letter, in which an attempt was made to reconcile certain discrepancies in the reports of Messrs. Hughes and Morgan, members of the Collodion Committee, I find that I did not convey my meaning quite clearly. The fact of a difference in the strength of the developer, or in the amount of retarding acid, might indeed explain the conflicting statements regarding the sensitiveness of a given collodion; and I am still of opinion that a collodion must be used both with a powerful and also with a feeble developer before its capabilities of giving a rapid impression can be determined. If, for instance, a collodion, containing iodide simply, were compared with one containing both iodide and bromide, the former might yield a picture in one half of the time when the developer consisted of three quarters of a grain of pyrogallic acid to the ounce of water; but if the proportion of pyrogallic acid were increased to three grains to the ounce of water, then the bromised collodion would be nearly equal to the other as regards rapidity of action—the fact being that the presence of bromide increases the difficulty of bringing out the latent image.

The part of my last letter with which I am not quite pleased, on again looking it over, is that referring to the effect produced when a collodion film becomes surface dry, previous to its exposure in the camera. In all probability this has much to do with the want of agreement between the results obtained by landscape photographers. I will give an instance. Some time since two bottles of bromo-iodised collodion were sent to me, labelled No. 1 and No. 2, with an inquiry, why the intensity of the image was so much greater in No. 2 than in No. 1? On examining them it appeared to me that, so far from the intensity being greater in No. 2, No 1 had decidedly the advantage in that respect; and from what I was able to gather as to the mode in which the pyroxyline had been manufactured in each case, undoubtedly No. 1 seemed on theoretical grounds to be the better calculated for conferring intensity. The only difference in the conditions under which the two sets of experiments were made appeared to be, that whilst my own were conducted at a moderate temperature, in a large and airy developing room, the experiments of my friend had been carried on in a room of a small size, at the top of the house, and heated by the sun. Now, the film from one of these two collodions was of the parchment kind, tough and horny, whilst the other was of a more open and pappy description, although far from being what is termed powdery. At common temperatures the parchment film gave the most density, but at very high temperatures this film suffered more than the other from shrinking; it became in a measure impervious to liquids, and did not allow the developer to penetrate. The formula with excess of alcohol, which Mr. Sutton advocates, ought to relieve us partly from this difficulty of drying up; and when the hot weather returns it is my intention to try it with the parchmentised pyroxyline, and with a mixture of iodide and bromide in the iodiser. The strength of alcohol which I should prefer would be the spirit of ·805, and the proportions about five of alcohol to three of ether. With simply iodised collodion this formula, although not so sensitive as the ordinary one, appears to answer in other respects, but hitherto I have not fully tested it with bromide and iodide combined.

Mr. Fenton states that in using bromo-iodised collodion on large plates, and with lenses of long focus, he is able to obtain enough intensity in the winter, but experiences a greater difficulty in the summer. Is this difficulty occasioned by a drying up of the film, or has the employment of sulphate of iron as a developer to do with it? The general opinion with regard to sulphate of iron as a developer for simply iodised collodion, is that the plates lose intensity more by over-exposure, and that the image is flatter under such circumstances than when pyrogallic acid is used. It does not, however, follow that this observation should apply to a bromised collodion, since, with such a collodion, there is far less difference between the action of pyrogallic acid and that of sulphate of iron, as regards the blackness of the negatives which they respectively produce. Careful experiment can alone decide the point. At present the fact remains unexplained that it is difficult to use parchmentised collodion, when bromo-iodised, if the plates are large and the weather very hot, the collodion being developed with sulphate of iron, and the film rather over-exposed than otherwise: the defect complained of is not exactly solarisation of the sky, but a want of vigour at every part of the image.

ON PHOTOGRAPHIC PRINTING UPON PAPER.

By W. T. Mabley.

[Read at the Meeting of the Manchester Photographic Society, April 4, 1860.]

(Concluded from page 111.)

I now pass on to the subject of toning by alkaline solutions of gold, and to illustrate it in the same manner as I have done the sensitiveness:—the standard paper and nitrate bath being as before, the former salted with ten grains of chloride of ammonium to the ounce of albumen, and floated for six minutes upon a sixty-grain nitrate. In toning these prints, the two constituting a pair were treated simultaneously, so that each was submitted as nearly as possible to the same chemical action. The trials being for comparison, any toning preparation might be used. I may state, however, that I adopted chloride of gold, to which carbonate of soda was added. Here is the first experiment, one print being on paper sensitised with the sixty-grain bath, and the other with a ninety-grain bath. It is remarkable that the weaker bath gives the darker print. This may be accidental, by reason of some peculiarities in the pieces of paper, and must not, I think, be taken as positive evidence to establish a fact; but the prints are so near in tone that we may, I think, fairly assume that no great advantage is derived by using a ninety-grain bath instead of a sixty-grain, without increasing the amount of chloride. It may indeed happen that an excess of free nitrate beyond a certain point has an injurious effect when prints are toned with alkaline chloride of gold; but this is quite at variance with received notions of photographic printing; and I express no confident opinion, reserving it amongst those things to be more fully investigated.

The next example is a comparison of prints floated upon the sixty-grain standard bath, and the old bath I referred to when speaking of sensitiveness. Here we find no difference; in each case the tone is the same, and I think, therefore, that we may safely conclude that the impurities which accumulate in a printing bath neither impair the sensitiveness or the toning quality.

Here are prints prepared upon the sixty-grain standard bath. Compared with others sensitised upon a bath having a faint alkaline reaction, there is not much difference in tone, but the sixty-grain bath, which I have before stated was slightly acid, certainly has the advantage. I wish this to be particularly remarked, on account of the next experiment.

Here we have prints prepared on the standard sixty-grain bath, and on another of equal strength, to which two drops of nitric acid has been added to each ounce of solution. The contrast is most remarkable in both pairs of prints; but the one pair, not having been pushed so much as the other, does not show it so distinctly. There is, however, the same contrast: the prints from the nitric acid bath being in one case quite purple, as opposed to brown, and in the other a blue black, as opposed to purple. These nitric acid prints, therefore, have clearly toned much faster than the others, and it would therefore appear that we have a ready means of overcoming the difficulty of toning which some papers possess. The blue tone is certainly anything but agreeable; but the other pair of prints show that this may be modified by being stopped at an earlier stage. I am not fond of venturing upon explanations of things which happen in photography, but as I conceive that further experiments may encourage the use of nitric acid baths, I would invite discussion on the subject, by assuming that, as in the collodion process, a developer with nitric acid causes a deposit of silver in a more metallic state than one without; so in paper printing the salt of silver may be reduced in an analogous manner: if so, the gold would, I presume, be more readily and completely reduced. I requested the experiment before this to be borne in mind, and for this reason that that experiment was between faintly acid and faintly alkaline baths; and I showed that the former appeared to advantage, so that the evidence there was in the same direction as the subsequent experiment, where the nitric acid was present in still greater quantity.

Here are prints floated upon the standard bath, to which seven minims of glacial acetic acid were added for each ounce: the difference is not great, but those from the acid bath are of a redder tone.

I have now to speak of the toning quality of paper which has been kept sensitised for a considerable time, and this I illustrate by a part of the paper mentioned before as having been given me by Mr. Pyne. The sensitiveness, as I have stated, appeared, if not exalted, at any rate to be unimpaired; but the toning quality does not follow the same good example. Here is the illustration, by which you will see that the kept paper has hardly toned at all, while that which was freshly prepared (both having been in the solution for the same time) has arrived at a satisfactory colour. After removing them from the bath I was anxious to see whether the long-kept paper would tone by prolonged treatment; I therefore cut off a portion and replaced it in the bath, that portion in No. 3, and you will perceive that the brilliancy is completely destroyed: with but very little addition of colour, it has the pinky appearance of all prints which have remained in the toning bath too long.

Whether this experiment must be considered conclusive against long-kept papers is a matter for reasonable doubt; but I am inclined to believe that it must be so: for although, as I only had a quarter sheet, I could not repeat the experiment, I do not see how it would have affected the case had I been able to do so; and the only opinion to the contrary must be founded upon the supposition that it was one of those papers (and there are such) that will not tone. The time, however, that it was kept is far beyond that which would be required for any practical purpose; and if we admit, therefore, the loss of toning property we must not, without further trial, condemn an otherwise most useful assistant to the photographer. At our next meeting I hope to bring forward evidence that will settle this question.

When I offered this paper it was my intention to have carried it on through all the practical details of photographic printing, but since I have been engaged upon it I have found effects that ought to be satisfactorily determined before I proceeded to that length; and I have therefore resolved to wait until further experiments should enable me to speak confidently, not only on those heads which I have introduced this evening, but upon the equally important subject, the composition of the toning bath.

It would be useless for me to tell you simply that which has been published many times, and which you know. My desire is that the several branches of photographic printing should be thoroughly investigated. I have commenced with the nitrate bath in reference to the sensitiveness and toning quality it imparts; and although I do not now found any practical course upon my experiments, I have, perhaps, learned that which will enable me to do so at no distant period. I now give you the results of these experiments, incomplete as they may be, in the hope that they may be followed up by those who have the turn of mind, and that they may be brought to a satisfactory termination.

[The above paper was accompanied by more than fifty illustrative prints.]

THE FOTHERGILL PROCESS.

By Alfred Keene.

[Read at the Meeting of the Birmingham Photographic Society, April 24th, 1860.]

It is now about two years since the Rev. Mr. Law, when delivering an address to the members of your society, read a letter from myself detailing, as far as then known, the principles of a dry process just previously discovered by a gentleman staying in Leamington. This was the first public account of the one now popularly known as the Fothergill, so called after its discoverer.

Having recently published a pamphlet on the Fothergill process, on which I bestowed much labour, and expended information obtained by careful and diligent investigation, I will not tax your time and patience by repeating all the details there given; but, begging the acceptance by each member of a copy, I will pass its contents in review, accompanied with such remarks as have suggested themselves worthy of notice, and afterwards briefly enter upon the principles of the process, the effect on the sensitiveness by the use of different quantities of water for diluting the bath on the surface of the sensitised plate previous to the application of prepared albumen, the important influence a coating of albumen previous to that of collodion exercises, and a modification of the process suggested by the latter. This plan will, I think, enable me to bring within the limits of my paper an amount of information on the subject not previously presented in a collected form.

On referring to page 4 of the pamphlet, it will be observed that the operating room should be dry, free from dust, and have the temperature raised, if required, to not less than 54° F. The reason for the latter is mentioned, and the former I will give when treating of manipulation. The other remarks upon the operating room I will pass over, as also those relating to glass plates, collodion, bath solution, and prepared albumen—having nothing to add to the information there given—and proceed to manipulation.

It is on the manner in which manipulation is conducted that success or failure chiefly depends, whatever may be the plan adopted—a remark that holds good for every photographic process, on account of the essential tendency to a re-arrangement of chemical combinations; for, however carefully one part of the operation is performed, if the other is done carelessly, or the solutions, &c., necessary for various stages are allowed to come into contact at other times, failure is sure to be the result.

I would here direct your attention to the facilities the suspended shelf offers, not only in the preparation but also in the development of dry plates: by its use, the application of the solutions is much more under the control of the operator, and the necessity for so much handling of the plates during preparation is obviated, thus removing one rather prolific cause of stains. The only objection I can offer to it is a tendency of the wood, even when well seasoned, to warp after it has been some time in use. This would be obviated by substituting glass, roughed or painted, to prevent blocks, &c., slipping off.

Each modification of the process offers some peculiar advantage that the other does not possess, and very excellent results are to be obtained by any of those given; but my preference is still for No. 1, and particularly the method of applying the water, by holding the glass containing the requisite quantity near to the surface of the plate, commencing to pour on at the end nearest the operator, advancing as the wave proceeds to the opposite end (a gentle inclination being given to the plate for the purpose), that the water may fall on the deepest part of the wave only, and finishing as directed, by which risks of uneven sensitiveness is prevented. The water should be kept in motion fully the time mentioned, and finally made to flow over the edges the plate then drained for a few seconds only, and the prepared albumen applied as directed. If a longer time is given for draining, there will be some difficulty in making the albumen flow well up to the edges, which is an advisable operation, as it gives increased firmness to the film. All excess of the albumen must be washed away, or it forms a coating that prevents the action of the developer, and so practically injures the sensitiveness. The prepared albumen should always be filtered prior to use: when recently prepared, even if with two parts of water to one white of egg and the requisite quantity of ammonia, this is a somewhat tedious operation; but after it has been made a fortnight or three weeks, it readily passes through the circular filtering paper. Unless filtered, it is liable to produce small non-sensitive patches, somewhat similar to those from the use of collodion in which a portion of iodide is suspended, not completely dissolved.

The direction given to change the paper saturated with moisture on which the plates stand to drain, after about ten or fifteen minutes, and also that the latter be allowed to surface dry before it is film dried, should receive attention; for long-continued moisture favours a modification of the albumen and the silver compound with partial solution of the iodide of silver, which exhibits itself in various markings when the exposed plate is developed. The same or a similar change is also produced, but much more quickly, by the action of artificial heat on the moist prepared plate. This latter is easily illustrated by preparing a plate; but instead of placing it first to drain, putting it at once, collodion side uppermost, on a heated surface to dry. At that part where water last collected, one larger or several small transparent rings will be found, when dry, from which the yellow iodide has been completely dissolved. The necessity for these precautions applies most particularly to the cold and damp winter and early spring months. Mr. Standish, of Devonport, informs me that he suspends a piece of sea-weed in his room—a very good and simple plan for ascertaining whether the latter is in a fit state for preparing plates in: if the sea-weed remains very damp, it cannot be expected that evaporation will be sufficiently quick. The exposure and developing, I think, do not appear to call for any comment; and the same may be said of failures and their cause and remedy, which, with what has been already given, are fully treated of. I might mention one other remedy to prevent the film cracking and peeling off, viz., the passing along the extreme edge of the prepared plate, when dry, a little quick drying varnish. This completes the review of the pamphlet, and what we may term the Fothergill process proper.

(To be concluded in our next.)

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING PHOTOGRAPHIC COLLODION.

By T. F. Hardwich.

[Read at a meeting of the Blackheath Photographic Society, April 16, 1860.]

Although not a member of your Society, I have asked and obtained permission to read a paper this evening upon collodion, being fully convinced that the interests of the art require a better understanding of the modes used for preparing that substance, and also a more perfect agreement between the various formulæ. At present it is almost impossible to compare the experimental results of photographers, or to deduce any general principles from them, seeing that scarcely two can be found who agree in their mode of working. I propose, therefore, to lay before you for discussion an outline of what has been certainly ascertained as regards the manufacture of photographic collodion.

For a long time subsequent to the discovery of the collodion process by Archer the whole chemistry of the subject was imperfectly understood; and, even on the main question of the constitution of pyroxyline, opinions were divided. In 1854 Mr. Hadow published his researches, establishing beyond the possibility of a doubt the true nature of pyroxyline as a substitution compound, and proving the existence of at least four varieties of that substance, ranging from xyloidine up to gun-cotton; the lower compounds containing less, and the higher compounds more, of the peroxide of nitrogen. Besides these varieties, it was shown that the properties of photographic pyroxyline are much affected by the temperature at which it is prepared, and that the same acid gives a different result accordingly as it is used hot or cold.

Subsequent to this, Dr. Norris, of Birmingham, sent two communications—the one to the *Journal of the Photographic Society*, and the other to another photographic journal—in which he called attention to a point not before noticed, viz., the superior value in collodion of the substitution compound nearest to xyloidine, compared with that containing more peroxide of nitrogen, and approaching to gun-cotton in composition. This point may not, perhaps, at first appear of great importance, but, in reality, it is so; and any maker of collodion who chose to neglect it, would fail in producing a first-rate article.

Whilst these investigations were being carried on, many of the manufacturers of negative photographic collodion prepared pyroxyline from paper or linen, finding by experience that it was difficult, when using cotton wool, to secure that limpid character of collodion and intensity of image which the operator requires. The reasons why paper—described by chemical authorities as identical with cotton in its composition—should yet act differently in this process, need not engage much of our attention; it will be sufficient to state that the difference is probably due, in part, to the weakening which ensues when the nitric acid touches the outer portion of the fibre, and in part to the fact of paper being often made from cellulose in a semi-decomposed state, or from *linen*, which has been proved to yield a pyroxyline of different properties from that furnished by cotton.

My own experience, as a maker of collodion for three years, enables me to speak with confidence against the employment of any materials which give intensity to collodion in virtue of some principle of decomposition; for—to say nothing of the difficulty of obtaining these substances in a uniform state — it is certain that the stability of the collodion is lessened by their employment; just as nitroglucose, a product of the action of nitrosulphuric acid on sugar, is more unstable than pyroxyline, so is pyroxyline made out of old calico or linen more unstable than pyroxyline prepared, in the same acids, from cotton wool. Pictures of first-rate excellence have been taken with collodion from linen, but I cannot now recommend such collodion; for, on attempting to export it to distant climates, or subject it to great heat in our own country, it is apt to undergo a spontaneous decomposition, even when kept in the plain state in a dark place, and without any addition of iodiser. A knowledge of this uncertainty in some kinds of collodion is highly useful, because it prevents the maker from placing dependence on a formula which would eventually disappoint him. It is probable that photographers, trying such a formula, will be pleased with it; but let them send the plain collodion for a voyage round the world, and try to work with it again on its return, when they will probably find it in a gelatinous state, or in a state of semi-liquefaction, and so highly ozonised as to be useless for any purpose.

We are, therefore, bound to discard all unstable materials, and to return once more to the cotton wool, which must, by some means or other, be *coerced* into the proper state. That this could be done was, I believe, known many years ago to individuals; but, if so, it was not published. I have stated, on a previous occasion, that the process for making intense negative collodion from cotton wool was suggested to me, in the first instance, by the experiment of soaking paper in diluted sulphuric acid, and subsequently converting it into pyroxyline. The nature of the change produced by the sulphuric acid on the cellulose is not known; but it has the effect of increasing the intensity of collodion made from the resulting pyroxyline, and of imparting those qualities of negative which I have spoken of in connection with decomposed materials, like old cambric. Fortunately, the pyroxyline from the fibre parchmentised by oil of vitriol is more stable than that from linen, and has been proved to stand as well in collodion as most other kinds of pyroxyline which the photographer is accustomed to employ.

But, in addition to an action of the sulphuric acid in this process, I have lately succeeded in proving that a hot and weak nitric acid may also exert a very peculiar effect, and one which is almost exactly the reverse of that produced by the oil of vitriol. To show this action of weak nitric acid, three volumes of pure nitric acid of 1·45 may be mixed with a volume of oil of vitriol,* heated to 150°, and pyroxyline from the formula which I shall presently describe as No. 1, immersed in it for a few seconds. This treatment causes very little change in the appearance of the pyroxyline; but, when made into collodion, it is found to have lost its characteristic toughness, and to have become weak and rotten. Further than this, the negatives are no longer sharp and intense, but feeble and metallic in appearance.†

The above facts are of more importance, as regards the manufacture of photographic collodion, than would at first be supposed; for it can be proved that those actions which have just been attributed to sulphuric acid and weak nitric acid respectively, may be secured at will by modifying the composition of the nitrosulphuric acid. If a strongly-parchmentised product suitable for making intense collodion be desired, the bulk of diluted oil of vitriol in the mixture must be considerably greater than that of the diluted nitric acid; whilst, if it be required to prepare a porous collodion to remain a longer time without becoming surface-dry, and to yield an image with less violent contrast of light and shade, then the proportion of weak nitric acid may be increased. Observe, also, that these differences are not due to variations in the temperature, or in the degree of concentration of the nitrosulphuric acid, both of which are supposed to be the same.

The following table exhibits the composition of five different mixtures of sulphuric and nitric acid, in which an attempt has been made to graduate the proportion of water, so that the per-centage of peroxide of nitrogen imparted to immersed cotton fibre may be nearly the same in each. The table may not, perhaps, be absolutely correct, since it is very difficult to judge precisely of the strength of nitrosulphuric acid, on account of its solvent action on cotton varying not only with the temperature and quantity of water, but also with the quantity of diluted oil of vitriol present. The safest plan, therefore, appeared to be to neglect all theoretical calculations, and to construct the table by simple experiment, taking care in each case to work with the maximum quantity of water, and stopping the addition of water only when it was found that the product left a thick sediment on being dissolved in ether and alcohol. This plan will probably be found to answer for the three upper members of the series, and the two lower members are not of much practical importance.

COMPOSITION, BY VOLUME, OF NITROSULPHURIC ACID FOR PREPARING PHOTOGRAPHIC PYROXYLINE.

	Oil of Vitriol, 1·845 at 60 F.	Pure Nitric Acid, 1·45 at 60 F.	Water.
No. 1	3	1	$\frac{7}{8}$
No. 2	2	1	$\frac{5}{8}$
No. 3	1	1	$\frac{5}{16}$
No. 4	1	2	$\frac{5}{32}$
No. 5	1	3	0

* In attempting to produce this change by means of nitric acid alone, it will be found difficult to prevent the cotton from being dissolved. Pyroxyline is easily soluble in dilute nitric acid, but the addition of a little diluted sulphuric acid throws it down again, so that sulphuric acid in small quantity lessens the solvent action, independently of abstracting water.

† In addition to this modified pyroxyline produced by hot nitric acid mixed with a little sulphuric acid, I find that a remarkable change of properties may be produced by the pure nitric acid of 1·45 employed cold, and without any admixture of sulphuric acid. The pyroxyline gradually becomes opaque, and loses its solubility in ether and alcohol; eventually it dissolves in the cold nitric acid without any evolution of gas, and, if water be then added, opaque white flakes are thrown down, which, when treated with ether and alcohol, simply swell up without passing into solution.

The pyroxyline yielded by each of these five mixtures is soluble in glacial acetic acid, and also in boiling absolute alcohol; whilst in neither case does the resulting collodion produce an entirely opaque film. The substitution body formed is therefore a little above compound D or xyloidine, but not above compound C. A more careful examination, by immersing dry cotton at low temperatures, seems to indicate that if there be a difference, No. 1 is somewhat stronger than No. 5. The collodion, however, from No. 1 is more fluid than that from No. 5, thus showing that other causes, besides temperature and dilution of the mixture with water, have to do with flowing properties. A greater amount of fluidity than exists even in the collodion from No. 1 may be produced by dipping the pyroxyline first in No. 1, to secure the full action of the sulphuric acid, and afterwards in No. 5; the weak nitric acid will then act more decidedly than it would have done after a single immersion.

The temperature employed for the above table of acids may be 150° F.; and, in making the pyroxyline, we find that the lower numbers give a product which has an opaque appearance; whereas, the pyroxyline made by No. 1 and No. 2 exhibits no opacity. The five samples of collodion differ very much in the rapidity with which they set upon the glass, and also in their physical structure: the first setting rapidly and producing a horny film; the last scarcely possessing any power of setting. The only way of overcoming this, and putting them on something like a par, is by varying the proportions of ether and alcohol in the solvents, using more alcohol in the former, and more ether in the latter. These collodions also differ very materially as regards the intensity of the negative image, which increases as you ascend the scale.

These disjointed remarks have been thrown together, not with a view of exhausting the subject, but simply to assist in reconciling some of the extraordinary discrepancies in writings on collodion; for, whilst one author advises that at least three parts of alcohol be employed to one part of ether, another (a French author) says that the art of making good collodion is in reducing the alcohol to the lowest possible limits, and employing scarcely anything but ether. Others, again, have written as if all depended upon the iodising solution, and have distinguished between the quality of negative produced by iodide of potassium and iodide of ammonium, or between iodide of potassium simply, and the same compound containing iodide of silver dissolved. Not that I mean to affirm that the nature of the base is of no importance at all, because there are secondary reactions between the base and the pyroxyline, but simply that the particular iodide employed is of minor consequence as compared with the mode of making the pyroxyline.

The reasons which induced me to fix upon the formula for nitrosulphuric acid, marked No. 1 in the table, were principally as follow: I was assured by those who professed to be acquainted with the wants of the public, that a collodion was needed which would produce a dense negative in a rather dull light; for that the practitioners of the art in this country had to perform their work, as a rule, under great disadvantages in that respect, and it was comparatively easy to reduce the intensity when in excess, but more difficult to increase it when deficient. The highly-parchmentised pyroxyline appears to me to have an organic reaction towards the salts of silver somewhat greater than that of the other varieties, and I attribute the tendency to redness in the negatives to that cause. It has not been proved to be so, but the idea may be entertained, seeing that the action of diluted sulphuric acid is known to change cellulose into dextrine, and both dextrine and gum impart a red colour to a collodion negative when applied to the surface of the partially-washed film.

If we allow that great intensity of negative ought always to be at our command, yet there are other modes of obtaining it without purposely modifying the pyroxyline, and therefore the question becomes, which is the best? Glycyrrhizine was carefully tried, both in bath and collodion, but was condemned as delusive in the long run, although promising well in the beginning. Neither could confidence be placed in ether containing organic impurities, although I have heard it said that the cheaper and more highly-methylated qualities of ether, as they were made some years back, gave better and more intense negatives than pure ether. Rejecting both of these expedients as being uncertain, and also fatal to the integrity of the nitrate bath, it seemed preferable to produce the effect by modifying the pyroxyline, since this mode is found to injure the bath scarcely or not at all. Having adopted an intense pyroxyline, it is of the utmost importance to secure a pure ether; because, when the pyroxyline is of the organic kind, the ether must be free from organic impurity, or the collodion will be less sensitive, and the negative either too intense or highly solarised.

Granting for the moment that the question of pyroxyline is definitely settled,* there remains still an important matter to be considered in relation to photographic collodion. Are we to work with iodide only, or with mixed iodide and bromide? It seems certain that if bromide could be invariably used, we should at once emerge from many of those difficulties which now surround us; for the invisible image on the bromised collodion is of a comparatively stable kind, and is less affected in its development by those small disturbing causes which often upset, so to speak, the latent picture upon the simply iodised collodion, and cause it to present itself either with spots or comets, or a total reversed gradation of light and shade. During the past summer it was my endeavour, as far as possible, to encourage the trial of bromised collodions, and in most cases where the light was strong the result proved satisfactory. When, however, the image of the camera was imperfectly illuminated, the experiments were, with some few exceptions, reported as unsuccessful, and the pictures pronounced weak and ineffective, unless the negatives had been artificially strengthened by bichloride of mercury, or some analogous process.

In conclusion, I would venture to ask the members of the Blackheath Society to lend their aid in settling this important matter. The present time is the best, because the interest of photographers has been aroused, and an opportunity seems to offer of establishing the manufacture of collodion upon a secure and well-understood basis.

A FEW REMARKS ON AMATEUR PHOTOGRAPHY.

By F. Howard.

[Read at a Meeting of the South London Photographic Society, April 19, 1860.]

This subject has been placed before the photographic, and would-be photographic, public in a multiplicity of forms, as exhibited in the one shilling, three and sixpenny, and more expensive works; in highly polished mahogany and cabinet work; in the opticians' windows, and in some score of advertisements every week, all tending to show how easy one may commence the study, and how portable the apparatus is, and what a never-failing source of enjoyment the amateur may possess at the cost of a few pounds and a few lessons; how he can take portraits of friends, views of the charming scenes he may visit when holiday-making, as illustrated by specimens in the warehouse of the photographic chemist or apparatus-maker. But the only specimens produced by amateurs, in a majority of cases, are black fingers and spotted linen. Instructions as to how to proceed have been given so successfully that I am afraid no remarks of mine can point out the road more truly, or give a brighter picture of how to succeed, than can be obtained from the perusal of publications of moderate price. There will be little then said by me about the manipulating or processes, as indeed they have, and will, I hope, continue to form subjects for many papers amongst us; but what I am desirous of drawing the attention of amateurs and beginners to is, that there is another side to this picture, and that, in commencing photography, if you really intend to produce pictures, you must make up your mind for some hard work and vigorous study, and that it is not the easy pursuit some imagine to produce a good photograph. I will beg the favour of your attention for a moment, and ask you to reflect on the great attention which photography has received at the hands of amateurs. The many advertisements commencing "to amateur photographers"—the many distressed correspondents to the four Journals devoted to photography—show how much it is practised. Persons of leisure and scientific research have often followed such subjects as chemistry, electrotyping, magnetism, and sundry other delightful pursuits, and have added greatly to the store of knowledge now possessed on these subjects; but they bear no comparison to the number of amateur photographers. This cannot be from any greater ease or facility with which it is acquired, because I think there are few of those pursuits which cannot be mastered much easier than photography. It may seem strange that, though the successful pursuit of photography is attended with much greater difficulties than the various pursuits I have named, still it numbers many more followers. One would imagine the reverse to be the case; but the

* There are some points relating to the theory of pyroxyline for photography which it has been deemed advisable to omit on the present occasion, through fear of complicating the subject. For instance, an intense collodion may be made from pyroxyline prepared without any excess of sulphuric acid, if the amount of water be diminished, and the temperature raised sufficiently to disintegrate the fibre (a little chlorine in the nitric acid will assist in this disintegration). This material, however, appears less stable than the other, and, when examined, is found to contain a bitter product of decomposition in some quantity. Probably the acids convert a portion of the cellulose into grape sugar, which, when acted on by nitric acid of a certain strength, forms nitroglucose. The experience of the author is unfavourable to the employment of this pyroxyline in photography.

great secret is that the results, when arrived at, are much more pleasing; they offer enjoyment not only to the amateur who, wrapt up in any pursuit, is delighted at the results, but to friends, acquaintances, and everybody who inspects them. You arrive at results which the most accomplished artist could never produce, and you find yourself in possession of a source of infinite amusement and instruction, with which can be combined healthful exercise with close study and research; and from the multiplicity and varied features of its application, a never-failing source of employment for the leisure hour. But with all these incentives, the successful pursuit necessitates a constant attention to the subject; because I consider him no true amateur who does not follow his art closely, watching every change and improvement, and ready to avail himself of them, and to increase his knowledge on the subject. This involves, for the amateur, far more attention and painstaking than, I am afraid, many feel disposed to give. I think we should see much better photographs than are now sometimes seen as amateur productions, if they were not satisfied with average results. That the most successful results can be arrived at I am certain. It does not do to be satisfied with average results, and plead that you are only an amateur: if determined to produce pictures, do insure their being creditable. The reminiscence of a tour in the country, the portrait of a friend, the copy of a print, will be much deteriorated in value if compelled to be prefaced by the apology, "I am only an amateur," instead of trying again for a better. It has been said that if we would only see our faults, we are in a fair way of correcting them; and I would especially encourage and recommend amateurs to compare their productions with those of the best professional photographers—to say to themselves candidly, "This is a bad photograph, I must try again," instead of putting it among their collection, and saying, "It is pretty well for an amateur." Besides, amateurs seem likely from their number to form a large proportion of the public, whose admiration is alike an incentive to the exertions of first-class photographers and a corrective to the inferior productions of which, alas! we see so many. I think that amateurs can do much in this matter; and a higher standard will be demanded, if amateurs, by ignoring their indifferent productions, place before their friends good specimens, and show them that photography can produce something to admire.

Gentlemen of leisure I would advise to make themselves masters of the art theoretically and practically: they have a chance of becoming something more than successful operators, as has been facetiously observed in alluding to the mass of photographers. If experimentalists, persons of leisure may achieve great success, and confer great boons on their less fortunate brethren; for I do not think there is a wider field than that open to the experimental amateur photographer. There is much to be discovered and improved upon, always remembering that they are themselves greatly indebted to what may be called the fathers of the art, for their liberality in giving their discoveries to the world.

And as regards the successful operators, there is a wide field for them also. By-the-by, an amateur may think himself very fortunate if he can be classed with the successful operators. It is no easy thing to accomplish this successful operation; for though you may not make your own collodion (which Mr. Seely, the American, says is a capital receipt for spoiling a suit of clothes), and may not be so well up in the chemistry of the art as you may desire, you must have a deal of perseverance to become even an operator; and I contend you are none the less a photographer, as I have observed, I think, in this room before, that it does not detract from the artist's talent, or make him less an artist, because he does not compound his own colours. A good operator is likewise absolutely necessary for good chemicals to be appreciated. It may be all very well for the photographic chemist or manufacturer of collodion to tell you this or that will answer admirably: I would rather have the opinion of a good operator as to its merits.

Pardon a little digression. What the distinction is between photographer or photographist and operator I cannot understand; but a distinction is made I believe. The person who prepares the plate, sensitises and develops, is called the operator, and the person who exposes is called the photographer, and calls himself artist—a misnomer evidently. My interpretation of artist does not apply to any photographer: it is impossible to apply to that which is produced by a careful attention to certain chemical laws the same title as you would to the production of the hand and brain of a clever man, and to call the producer of either an artist indiscriminately, and sell both productions by the square inch. I merely allude to this vexed question because I think there ought to be no distinction in the term photographer, except as photographic chemist, apparatus maker, experimentalist, and working photographer. If there is any claim to the title of artist from the exposing portion of the work, I think all amateurs ought to claim the title at once, as having not only to expose, but excite, develop, and perform all the disagreeable adjuncts of plate-cleaning, &c.

(To be concluded in our next.)

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

(Continued from page 114.)

Our previous experiments have already established that, after a suitable fixing, the proof is formed of two different substances, mixed in variable proportions—metallic silver and the argento-organic compounds. It is these, and these only, that constitute the coloured parts of the proof; therefore it is upon them that the ordinary re-agents, after having fixed the proof, can exercise a subsequent destructive action.

Setting out from this fact, we propose to examine whether, independently of every accessory circumstance, the fixing agents can exercise a dissolving action upon these two substances. With this object we have, on the one hand, prepared some metallic silver by reducing the chloride by light alone; and, on the other, some argento-organic matter, by placing in similar circumstances a solution of starch containing chloride of silver in suspension. After the action of the light the precipitates thus obtained were fixed. Thus fixed, they were placed in solution of cyanide of potassium, of two per cent. strength, in concentrated ammonia solution, and in hypo of ten per cent.; then, after the lapse of various periods of time, we have examined the supernatant solutions for the presence of silver. Operating in this manner, we observed very important differences in their mode of action.

First, as to cyanide of potassium. This re-agent attacks and dissolves metallic silver as well as the argento-organic compound, but it acts much quicker upon the first than upon the second. After one day's contact, the solution covering the metallic silver already contained notable quantities of this metal; the solution that covered the argento-organic compound also contained some of it, but in a smaller quantity, and only at the end of two or three days did the result obtained with this latter equal that furnished by the first. These facts, observed under clear and precise conditions, lead us to understand why we cannot employ the energetic solvent properties of cyanide of potassium in positive printing. This agent fixes rapidly and well, but its action upon the coloured portions requires too much care and precaution,—it is in fact a dangerous re-agent.

The action exercised by ammonia is entirely different. We have already remarked upon the peculiar colouration which, by a dyeing phenomenon, this re-agent communicates to the argento-organic compound; but there is another point of view, extremely important in practice, to which we must call attention. When we leave silver, the argento-organic compound for instance, in contact with strong ammonia, we perceive, even after eight days of contact, that the ammonia has not removed the slightest traces of silver from either, by which we may conclude that ammonia does not dissolve the coloured portions of the proof; but, at the same time, a curious phenomenon exhibits itself, for whatever the care taken, the ammonia solution above the two precipitates does not become clear, but remains constantly opaline, and appears to hold in suspension an almost imperceptible yellow precipitate, as if dissolving at first a small quantity of silver, the ammonia immediately deposited it in a state of ammoniacal combination. From this follows the explanation of the influence that fixing by ammonia exercises upon the whites of the proof, in communicating a light yellow tint to them. We may, in fact, attribute it to the formation of this yellow precipitate which we have constantly observed in the supernatant ammoniacal solution, both of metallic silver and the argento-organic compound. At the moment when the proof is plunged into the ammonia, the iron-coloured parts are rapidly dissolved; but if the sojourn be prolonged, an action is set up between the coloured film and the alkali, an action which is shown by the formation of a precipitate which is deposited equally all over the proof.

As for the fresh hyposulphite of soda, it acts upon the coloured parts of the proof, not like ammonia, but in the same manner as cyanide of potassium. Put in contact, in a state of solution, with the silver and the argento-organic matter, it ultimately attacks and partially dissolves both, only, as the daily experience of photographers proves, it acts with much less energy than diluted cyanide. Still its action is very evident, and indicates, *a priori*, for every fixing compound, the necessity of not leaving the proofs

too long in the fixing bath. We shall take care, in a subsequent chapter, to state approximatively the time necessary for fixing with solutions of hypo, of various degrees of strength.

To sum up what has been stated, we say, that cyanide of potassium, even when diluted, rapidly removes the coloured portions of the proof. Ammonia does not dissolve them, but, at the end of a certain time, this alkali, by means of a silver compound, tints the white of the proofs yellow: the hyposulphite of soda attacks the coloured parts of the proof, but only after the lapse of considerable time.

Such are the chief facts which we have been able to recognise by means of our researches upon the action of the fixing agent upon the proof. We shall next group them together, and endeavour to deduce results by which a surer and more rational method of fixing may be established.

(To be continued.)

DOUBLE CHLORIDES OF GOLD AND POTASSIUM AND GOLD AND SODIUM.

By M. Fordos.

In a mixture of one hundred parts of nitric acid and four hundred parts of hydrochloric acid dissolve one hundred parts of pure gold. Evaporate the solution so as to obtain hydrochlorate of the chloride; then add fifty-one parts of bicarbonate of potassa in distilled water, and evaporate to dryness; then expose to a gentle heat, to drive off the excess of acid, and dissolve the dried product in distilled water. Filter the solution through asbestos or powdered glass, and evaporate the liquid to obtain crystals. These consist of one equivalent of perchloride of gold, one equivalent of chloride of potassium, and five equivalents of water—

$$Au\,Cl_3,\,K\,Cl + 5\,H\,O.$$

Chloride of gold and sodium is prepared in the same manner, substituting ninety-three parts of carbonate of soda for the fifty-one parts of bicarbonate of potassa. Its formula is —

$$Au\,Cl_3,\,Na\,Cl + 4\,H\,O.$$

NOTICES OF RECENTLY PUBLISHED STEREOGRAPHS.

Fountains Abbey.

W. Woodward, Nottingham.

There are but few people who do not feel some sort of interest in connexion with the ruined edifices of former days, even if they are nothing more than mere heaps of rubbish. To what speculations do they not give rise! What an array of pleasant associations do they not leave in our memories! But if instead of mere shapeless heaps we have arches and towers, buttresses and mullions, sculpture and tracery in sufficient abundance just to indicate the glories that have been, without too clearly defining what may possibly have been wanting, while the rugged features, traced by the destroying hand of time, are clothed with a graceful veil of verdant ivy and modest creepers, then indeed we fairly slacken the reins of imagination, and let it revel in unshackled freedom.

Perhaps one of the peculiar charms attendant on a visit to some celebrated monument of antiquity may be found in noticing its effect upon our companions — how one is engrossed by the archæological features, another has an eye solely to the picturesque, a third poetises and peoples the now vacant tenement with phantoms of its fancied former occupants; then there are the pleasant ramble and scramble, with the thousand little surprises, the bright sunshine and murmuring breeze — (who would visit a ruin in bad weather?) — the high spirits, and, perchance, the ringing laughter of musical voices. To how many such "green spots in memory's waste" may not a visit to Fountains Abbey have given rise! We have never been fortunate enough to tread the mossy turf of that charming spot, yet we have wandered there in spirit by the aid of those twin-sister fairies, named respectively Camera and Stereoscope, and perhaps we have been enabled to carry away a more vivid recollection of the local beauties than some who have visited them in the body: who knows? But, be that so or not, of this we are quite sure, that those who have been visitors will certainly be delighted to possess the pleasing series of transcripts before us to brighten up their impressions, while those who have not been so favoured will be equally glad to have a chance of becoming acquainted with the charms of this renowned spot.

Mr. Woodward has laid before us Fountains Abbey in many aspects — views from east, west, north, and south, near and distant, in sunshine and in shade, nave, choir, gateway, aisle, turret—all are here, and all are charming, though as photographs some are certainly better than others.—In the Nave and Choir (No. 118), the effect is marred, to some extent, by the distortion arising from the lens employed; but in No. 116, the Gateway of the Eleemosynary Chapel, and No. 122, The Bridge leading to the same, no such defect is apparent, and both are highly pleasing subjects, apart even from any association, and are treated in an artistic manner.—The Bridge over the Skell (No. 121), which forms a part of the series, is also a beautifully-executed production.— Of the remainder we will mention No. 111, South-east View from De Grey's Walk, as presenting perhaps the most pleasing general view of the ruin, and No. 110, A South View from the same spot. Of this last we have two specimens, the point of view in each differing but a few yards from the other, yet the aspect is wonderfully different. The fact is, that by a little careful inspection we perceive that one copy must have been taken in the morning and the other in the afternoon, and consequently the shadows are thrown totally in opposite directions. Both specimens are good, but that taken in the afternoon is decidedly the most pleasing, not only on account of the direction of the shadows, but the slight variation in the point of delineation has introduced the trunk of an old tree, which materially heightens the effect.

Mr. Woodward is an industrious and skilful operator, and his works deserve an extended circulation.

THE "LIVERPOOL ALBION" ON PHOTOGRAPHY AND THE FINE ARTS.

A Critic, according to the strict definition of the term, is a person who *can judge*, and consequently "who takes upon himself to censure others' works." He who is no judge can be no critic, and the censure or praise of such a person will therefore be equally valueless. We read of a judge who decided all causes by the throwing of dice, but no one upholds the justice of his decisions, summary as they undoubtedly were; and no one, I opine, would think the exposure of such an unauthorised arbitrator undeserving notice. This is my plea for a little of the valuable space of The British Journal of Photography.

Speaking of the photographs now exhibiting at the Exhibition of Fine Arts in Liverpool, a critic in the *Liverpool Albion* says:—"The value of these, however, *are* not only independent of, but wholly at variance with, the fine arts. They are records of facts conveying the testimony of their truth in themselves. But the fine arts consist in the application of these facts to elicit higher feelings or emotions, and in this photography has hitherto entirely failed." And he adds, "The only use of exhibiting such things with pictures and drawings is the chance that they may, by comparison, instruct the people in the difference between nature and art." Thus with portentous wisdom enthroned upon the knitted brows, with hand outstretched and palm turned outward, the sage hath spoken, "as who should say, I am Sir Oracle, and when I ope *my* lips let no dog bark."

Now, although the imitation of nature will always be subservient to the more intellectual qualities of art, I have yet to learn that the fact is "independent of, and wholly at variance with, the fine arts." I have yet to learn that the loftier emotions of the mind may not answer the call of truth as readily as that of any art called "fine." And I cannot believe that the faithful imitation of nature in her most picturesque and poetical aspects does not constitute a fine art, simply because the mechanical aids employed are neither brushes and colours nor pencils.

As a fitting comment upon this piece of unqualified and unsupported criticism, permit me to repeat an oft-told anecdote.

The mighty emperor of China, and of nearly all the rest of the universe, brother to the sun, cousin to the fixed stars, and near connection of that very influential relative, the moon, desired a picture of a new street in his capital, and commissioned a certain European painter, then in his neighbourhood, to paint the same. The artist did his best, and on the day appointed brought the production to the celestial court. Of course it was executed with due regard for the rules of linear and ærial perspective, and in the eye of the artist was therefore a good record of a fact "conveying the testimony of its truth" in itself. So with anxiously beating heart he uncovered the painting, that the radiance of the divinely royal optics might fall upon it: as they did so, the emperor started to his feet, struck dumb with astonishment. "It is the street itself!" at last gasped the astounded sovereign. "It *is* the street itself!" murmured the amazed courtiers. Then the artist breathed freely, and glowing visions of wealth, rank, and honour flitted before his imagination; but — "Let that presumptuous barbarian deceiver be instantly bastinadoed!" cried the emperor, turning a glance of annihilating wrath upon the horrified artist. "We commanded him to produce *a picture* of the street, and behold! he hath produced the street itself! we swear we could walk down it! Away with him! but let the thing he made be preserved for its only use, namely, that it may, 'by comparison, instruct the people in the difference between nature and art.'"

To return to our oracular critic. We next find him asserting that "Photography, though valuable as an aid to science, and, so far as it can preserve a record of appearances, subsidiary to fine art as saving the trouble to an artist of making sketches, is not a fine art, and never can be made so!" Some irreverent folk will ask Sir Oracle, "Why not?" And so they may, for Sir Oracle hath said his say, and "there's an end

on't." Photography "is not a fine art," says he, and of course it is not. Photography "*never will be a fine art*," says he, and of course it never will be!

I once before had occasion to remark that the cause of art is at enmity with such worthies as resemble our Liverpool art critic. Their fanciful and frivolous distinctions, their mystical rhapsodies, their loose talk about the ideal, abstract ideas, &c., have so confused and befogged the mind upon all matters connected with art, that it is but small wonder when we find that the public are more thoroughly ignorant of art than of any other subject of a character equally popular. Permit me also to remind you that, in the paper already referred to, I boldly stated that light plays much the same part in photography that pencils do in drawing, and that photographs are produced by the camera and lens in exactly the same sense as paintings are produced by paint and brushes; that bad photographs, however numerous they may be, are not conclusive proofs against the possibility of producing good ones, any more than inartistic paintings are evidence against the possibility of paintings being artistic. I know very well that artists of repute have subscribed to the opinion of the Chinese Emperor (and said, in the words of an eminent lecturer upon art, "*Painting is, strictly speaking, no imitation at all of external nature*"): but their works have eloquently and forcibly denied their words; and the only painters who really seem to subscribe to this doctrine are the pre-Raphaelites denounced by our oracle, whose works *really* are "no imitation at all of external nature." I might point out the impossibility of depicting abstract ideas, and show how idealising is only a different mode of imitation; how imagination will make pictures in the clouds, the burning coals, and the changeful shadows, which yet exist neither in the clouds, the fire, or the shadows. I might dwell upon natural beauties whose faithful and perfect imitations would contain more poetry, more sublimity, more associated ideas of love, tenderness, admiration, religious veneration, sympathy, and pity, than Sir Oracle would listen to (for fear he might be convinced); but, instead of that, I will turn to our photographers, and earnestly call upon them to regard photography, not as a chemical or optical study only, but as *a fine art*. If they will only do this their productions will give a gloriously triumphant denial to the carping critics who so dogmatically denounce, and would fain degrade, our beautiful but infant art. ALFRED. H. WALL.

Meetings of Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

On Monday, the 16th ult., the Annual General Meeting of the Blackheath Photographic Society was held at the Golf Club-house,—the President, J. Glaisher, F.R.S., in the chair.

After the minutes of the previous meeting had been read and confirmed, Messrs. C. Busk and H. Williams were appointed auditors.

In consequence of the resignation of Mr. J. B. Spencer, as Treasurer, a motion was moved, and carried unanimously, requesting the joint Secretaries, Messrs. T. R. Wheeler and Travers B. Wire, to act also as treasurers. To effect this change, the bye-law bearing on the office was altered accordingly.

After the usual vote of thanks to the Secretaries for their services during the year, the Report of the Council was read, adopted, and ordered to be printed for circulation among the members.

Mr. Glaisher, the President of the Society, in conformity with the bye-law, retired from his office, and, on a ballot being taken, Mr. Heisch, F.C.S., was chosen to succeed Mr. Glaisher in the office of president. The following resolution was then moved by Mr. J. Harding, seconded by Mr. H. Williams, and carried *nem. con.*:—"That the best thanks of this Society be tendered to J. Glaisher, Esq., for his able, impartial, and conciliatory conduct, while in occupation of the chair of this Society."

Mr. Glaisher, having made a suitable response, vacated the chair in favour of his successor.

Mr. Heisch, on taking the chair, made a few brief remarks to the members, and then called on Mr. T. F. Hardwich to read his paper *On the Present State of our Knowledge Regarding Photographic Collodion.* [See page 130].

When Mr. Hardwich had concluded his paper,

The President (Mr. Heisch) spoke as follows:—I have listened with great pleasure to Mr. Hardwich's communication, and while cordially agreeing with much that he has said, there are still one or two points on which my experience has led me to slightly different conclusions. I am not altogether prepared to discard the use of paper as a material for the manufacture of collodion, as I believe that there are certain properties possessed by such collodion which cannot be secured by the use of cotton. I believe that a greater weight of pyroxyline may be dissolved in a given quantity of ether or alcohol, and still run well, when we use paper than when we use cotton, and this is often of importance. I have not found collodion thus prepared more subject to decomposition than any other, if proper care be taken to secure pure ether and alcohol. During the heat of last summer, my dark room was for a long time at a temperature of 96°, and in that room I kept and used the collodion, not only for wet but for dry plates, and got on perfectly well, while many of my friends using the same process with other collodion, were brought up by the heat, and could not use their plates. I have still by me collodion prepared eighteen months ago, and it shows no signs of spoiling. I do not mean to say I should recommend collodion such as I am now speaking of for all purposes; indeed, I fear it is impossible to obtain any collodion which will suit the requirements of all photographers, the circumstances under which they work being so different. Thus, a collodion admirably adapted for portraiture in a glass house, is hardly that which one would choose for copying new stone buildings in a bright sunlight, nor that again, the same as for dark foliage; and it is a question if the requisite differences can be obtained with one pyroxyline by variations of solvents or iodisers, or if it will not be found necessary to vary the pyroxyline itself. The purposes for which I chiefly employ collodion are such as do not require any great amount of sensibility, but rather the capability of standing considerable exposure without solarising, so that the bottoms of deep holes of different colours may be brought out before the lighter portions are burnt up. The pyroxyline I employ is prepared with

* Nitric acid, sp. gr. 1430	39 parts.
Sulphuric acid	31 „

Swedish filtering paper is soaked in this for one hour, at a temperature first of 130° to 135°, and allowed gradually to cool, keeping it well shaken for the first ten minutes, to bring fresh portions of acid constantly in contact with the paper. The solvent is ether five parts, and absolute alcohol three parts, including that in which the iodides are dissolved. For very large plates I should use six grains of pyroxyline to one ounce of the solvent; for anything up to ten and eight inches, eight grains. This collodion, besides its non-liability to solarisation, is remarkably well adapted for dry processes, losing its sensibility less in drying than most. I have recently tried with this another collodion iodised precisely in the same way, though the latter worked in one-third of the time when wet: after drying, it required nearly double the time requisite with my collodion. With regard to the question of bromides in collodion, the Society are aware that I have devoted much attention to the subject. I am not prepared to advise their use on all occasions, more particularly for portraiture: in landscape collodion, I think them always useful. I see no reason to doubt the truth of what I stated to the Society on a former occasion, that they should be used in atomic proportions: for subjects in which greens predominate, two atoms of iodide to one of bromide I still believe to be the best; indeed, I should take this as a general landscape collodion. I may mention, as confirming this view, that, since I first published this formula in 1852, several others, uninfluenced by theoretical considerations, but simply going on adding bromide till the best working point was reached, have published formulæ in which the bromide and iodide are precisely in the proportions above mentioned. For reds and yellows, I believe the proportion of bromide may be advantageously increased. Our late president, Mr. Glaisher, finds that for artificial light, in which the yellow is very predominant, two atoms of bromide to one atom of iodide give the best results. This formula was also arrived at purely experimentally. When, some time ago, Mr. Hardwich spoke on this subject, he thought I had recommended too large a proportion of bromide. I observe in his last formula he has much increased the quantity he first employed, and I am not without hopes of ultimately converting him to the "atomic theory" as applied to this subject.

After a cordial vote of thanks to Mr. Hardwich for his admirable paper, Mr. Vernon Heath was elected a member of the Society, and the meeting was then adjourned to the 21st instant.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of the above Association was held at Myddleton Hall, Islington, on Wednesday last, the 25th ult. George Shadbolt, V.P., occupied the chair.

Mr. George Dawson read a paper *On the Reaction of the Chloride of Silver upon the Hyposulphite of Soda.* [See page 127].

In consequence of a press of matter the report of the discussion on Mr. Dawson's paper is deferred till our next number.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held on the 19th instant, in the Lecture Hall, Walworth,—the Rev. F. F. Statham, B.A., F.G.S., President, in the chair.

The minutes of the last meeting having been read and confirmed,

The Secretary read the following rules, drawn up by the committee, for the regulation of the Exchange Club:—

1.—That a Secretary be appointed by the Committee to negotiate all exchanges between members and non-members of the Society, in order that an equitable arrangement may be secured.

2.—That gentlemen and ladies be eligible for membership, whether members of the Society or not; and that no form of introduction be necessary beyond that of placing in the Society's folio a specimen print, with the name, address, and the words "for exchange" attached.

3.—That all communications relative to the business of this Exchange Club be prepaid, and stamps enclosed for replies.

4.—That a list of members, and a description of such specimens as are provided for exchange, be published quarterly; and that no alteration be made in these Rules save at a special meeting, convened by at least one-third of the members.

Mr. Hannaford having kindly consented to act as Secretary to the Exchange Club, communications may be addressed to him at 6, South Grove West, Mildmay Park, Stoke Newington, N.

* The acid I employ is that called "acid nitros," of sp. gr. 1420, or thereabouts, made up to sp. gr. 1430, with pure nitric acid of sp. gr. 1500. I find this gives better results than acid which contains more of the lower oxides of nitrogen.

Mr. Wall placed his own name, that of Mr. F. Howard, and Mr. Leake, jun., down as members.

It was then stated that several members of the committee, and others of the Society, had discussed the possibility and propriety of dispensing with the usual three months' recess, and holding meetings in the open air, within a few miles of town, so that they might put the knowledge acquired at such meetings as the present into practice; give the beginner among their members an opportunity of working side by side with professional operators and experienced amateurs, and strengthen the social harmony which then, happily, so closely united their little community. These open-air meetings would, he had no doubt, also tend to advance the art of photography; and, as ladies would be enabled to accompany the members, the pleasure derived would be considerably enhanced. It was suggested that such meetings should be held upon the third Saturday in each month, commencing in July. A somewhat similar meeting (a sketch of which appeared in the last number of The British Journal of Photography) had been held in Epping Forest, at which Messrs. Wall, Hannaford, Howard, Simpson, Hearle, Leake, Cotton, and others had been present, and the success of that experiment augured favourably for its repetition. They were accompanied by ladies upon this occasion, and he, the Secretary, could assure the members (despite Mr. Shadbolt's sly comment) that their presence in nowise retarded the business of that which was one of the most pleasant of pleasant days.

Upon the motion of Mr. Hannaford, it was agreed that the next meeting should be made special, to effect the requisite alteration in the rules of the Society.

Seven stereographs, by Messrs. Wall and Leake, were presented for the folio. These had been taken upon the occasion above referred to, and the President pointed out a group called *The Earliest Pic-Nic of the Season*, which he thought fully illustrated the Secretary's remarks, and showed how useful a few ladies might be made in giving fresh charms to the landscapes, or adding character to the scenes depicted.

An excellent adaptation of the alabastrine process was illustrated by a very beautiful specimen, presented by N. E. Fitch, Esq.

The Secretary also presented a print from a panoramic negative, taken by Mr. Sutton. He was of opinion that the Parent Society had scarcely done justice to this invention, and said, although conscious that little boys should hesitate before they found fault with their papas, they must pardon him for adding that, whatever the practical utility of this panoramic lens and camera might be, it was certainly of a character which should ensure respectful attention from a body of gentlemen assuming the office of judges. Had he been present, he should probably have reminded one or two of the members of that Society that Mr. Sutton's invention, and not Mr. Sutton's peculiarities, was the subject of discussion, and that the substitution of ridicule for argument was not consistent with either good taste or sound sense.

Mr. Howard then read a paper, entitled *A Few Remarks on Amateur Photography* [see page 131], showing, as amateur productions, some dozens of excellent stereographs.—On the conclusion of the reading of the paper,

The Chairman complimented Mr. Howard upon his honesty of purpose in not disguising the many real difficulties in the way of all beginners, and urging them to aim at the higher excellencies of the art. But it should be remembered that even our most successful professionals were once amateurs, and owed their eminence solely to courage and perseverance.

The usual vote of thanks was then warmly accorded.

Mr. Wall thought the glove had been thrown down to him by Mr. Howard, as that gentleman knew that he always held the real photographer to be also an artist. He (Mr. Wall) saw productions at the last Photographic Exhibition that were unmistakably pictures, and owed their superiority not to extra mechanical skill, or great chemical acquirements, but to "the hand and brain of a clever man." He had so recently expressed his opinions upon this subject he would not fatigue the members by their repetition, but content himself by adding, that however deficient in artistic qualities the great mass of photographic productions might *now* be, he was certain that they were not necessarily so.

Mr. Hannaford said that when the photographer was also an artist, his productions were pictures, although few photographs deserved the title of artistic. The photographer who had no knowledge of art planted his camera almost at random, and was dependent upon mere chance for the results; but this was not the case with the artist. Mr. Hannaford here took up several of the photographs exhibited, and pointed out their sins against the artistic (one of which Mr. Martin entitled *The Picture of a Post*, such an object occupying the most conspicuous and important position in the view). Referring to the power a photographer possessed of making pictures, Mr. Hannaford said this power was increased when a greater angle was secured, as was the case with the new panoramic lens (a statement which he illustrated with some remarks upon the print Mr. Wall had presented), and then proceeded to touch upon the question of photography in the early morning, and the use of river, rain, and distilled water, concluding by thanking Mr. Howard for his excellent paper.

Mr. Howard, in reply, said he of course knew that the claim of a photographer to the title of artist was a vexed question, but he was not competent to decide it. The subject of water, he thought, should be treated with discretion. He always used distilled, and recommended others to do the same; and, with regard to the possibility of producing pictures at five o'clock in the morning, he begged to submit some so taken to the inspection of the members.

Mr. Simpson said he also should recommend the use of distilled water, and that extreme care in every branch of the process advocated by Mr. Howard, if only for this reason, viz., that such carefulness limited the field which in case of failures would have to be traversed for their causes.

Mr. Howard thought extreme carelessness seemed to be characteristic of some operators, and by way of instance referred to a comical letter which appeared in the last number of The British Journal of Photography, signed "Israel Holdsworth."

Mr. Simpson remarked that when a man of such a stamp said he had no failures it was more than probable that less partial judges would say he had no successes. That correspondent, however, was very logical: he not only asserted that "a deal of nonsense is written," but accompanied the assertion with a most conclusive proof of the fact.

Mr. Thomas Clarke next detailed a series of experiments, intended to demonstrate that a film containing a simple iodide, without free nitrate or any other salt of silver, was just as sensitive as when the before mentioned conditions had been complied with; and afterwards gave the following as the results of some experiments with the alkaline silver bath:—

1. Forty grains, rendered alkaline with NH_3, gave foggy pictures.
2. Thirty grains, rendered alkaline with NH_3, at times clear pictures.
3. Forty grains, render alkaline with NaO, CO_2, at times slightly foggy.
4. Thirty grains, rendered alkaline with NaO, CO_2, produced perfectly clear pictures.

The President would not pretend to offer any remarks upon the value of Mr. Clarke's experiments; but, in performing such, that gentleman had given the members a very excellent example, and deserved their thanks.

A vote of thanks was then awarded to Mr. T. Clarke.

Mr. Simpson inquired if Mr. Clarke had manufactured the collodion he had used in his experiments, or knew its character, because the whole question hinged on the point as to whether the collodion contained a simple iodide or a bromide also.

Mr. Clarke had merely purchased the collodion, and therefore could not answer Mr. Simpson. It was, however, procured from Messrs. Horne and Thornthwaite's.

Mr. Leake had never himself succeeded in procuring a good picture with an alkaline silver bath.

Mr. Hannaford affirmed that if free silver were removed from the plate, as described by Mr. Clarke, a very great increase in the time of exposure would be required to obtain even the trace of a picture.

Mr. Howard must certainly agree with the remarks made by Mr. Hannaford. Learning from the Secretary the nature of Mr. Clarke's experiments he had repeated them, and the results were such as he (Mr. Hannaford) described.

Mr. Martin said, in a film containing two salts of silver, when the free nitrate was removed, the plate was insensitive to light; and instanced the collodio-albumen process, in which the free silver was removed by iodide of potassium.

Mr. Leake named the Talbotype process also.

Mr. Martin said in that case a single iodide was used; in the other the collodion contained both an iodide and a bromide, thus forming in the excited film two salts of silver.

Mr. Hannaford thought Mr. Martin had overlooked the fact, that in the case of the collodio-albumen they obtained in the insensitive state of the plate the *white* iodide of silver, on which light had little or no effect. That was afterwards converted into the yellow or sensitive iodide by re-immersion in the nitrate of silver bath. Dr. Hill Norris had stated, in a paper read last year at a meeting of the North London Society, that he believed these two salts were chemically different.

Mr. Ackland stated that he had taken a "Hill Norris" prepared plate, exposed it to light, and then treated it as though it were simply a clean plate. He afterwards prepared it by the Fothergill process, exposed again, and, on developing, found the picture perfect, permeating both films. Here the exciting had restored the first film to its state of sensitiveness.

Mr. Hannaford said, if they sensitised, exposed to light, and then collodionised, the plate would evidently be rendered insensitive, exactly as in the collodio-albumen process—the iodide in the collodion acting in the same manner as the iodised albumen.

Mr. Simpson remarked that the old daguerreotypists were in the habit of restoring a plate, the sensitiveness of which had been lost by exposure, by placing it again over the iodine.

Mr. Martin said, beyond question, there was no excess of the silver salt in the formation of the iodide.

Mr. Leake remarked that the fumes of acetic acid had been said to restore sensitiveness.

The discussion then grew very animated, and

Mr. Martin remarked upon the attempts made in scientific works to draw such extremely nice distinctions, more especially in reference to what is called the allotropic condition. As an instance of the changes in colour effected by molecular disturbance, he stated that on mixing mercury and iodine in the proportion to form biniodide of mercury, and submitting to a certain sufficient temperature, crystals condensed in the cool part of the tube, which, while hot, were bright yellow, but on cooling assumed a brilliant scarlet colour. If the same elements be combined in the proportion to form iodide of mercury, and the mixture be treated in a similar manner, the crystals which condensed in the cooler position of the tube were scarlet while hot, and yellow when cold. If both of these

be examined while cooling by a magnifying glass, a change of crystalline form would be found taking place, illustrating very aptly that molecular arrangement would cause or determine colour; *ergo*, molecular arrangement *might* determine colour in iodide of silver precipitated in excess of nitrate or iodide.

Mr. Hannaford regretted that no satisfactory solution of the chemistry of the Daguerrean process had been arrived at.

The discussion then turned upon that subject, Mr. Martin suggesting that some attention should be given to certain experiments illustrative of this question. It is hoped that these may be made the subject of a future paper.

The President announced short papers in continuation of the *Photographic Jottings*, by Mr. Martin and Mr. Leake:—by the first named gentleman upon *The Effect Produced in the Actinic Power of Light by Variously Coloured Glass;* by the second *Upon a New Field Apparatus, with some Remarks about the Using thereof;* and a paper which he should have the pleasure of reading himself, upon *Photography as Allied to Science.*

Votes of thanks were passed to Mr. N. E. Fitch and the Secretary, for their gifts to the folio, after which Mr. Wheeler was duly elected.

The meeting after the next being the annual meeting, it will be chiefly occupied with the reports and other business of the Society. All members and intending members are specially requested to attend.

The meeting was then adjourned.

Erratum: Mr. Tilstone.—The name of this gentleman was made "Silstone" in a previous report.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The monthly meeting of the above Society was held on Thursday evening, the 12th ult. A. Mactear, Esq., Vice-President, occupied the chair.

Mr. J. Spencer, jun., acted as Secretary, in the absence of Mr. John Cramb, who had gone to Syria on a photographic tour.

The minutes of the last meeting were read and approved of.

The Treasurer, Mr. Robertson, requested Mr. Stuart to inform the Society by what method he had succeeded in producing photographs on ivory.

Mr. Stuart then exhibited several uncoloured portraits taken on ivory, of a very satisfactory character. His method of manipulating is as follows:—An ivory slab is well polished with finely-ground pumicestone, so as to be entirely free from scratches. After which it is soaked in a hot solution of gelatine, ten grains to the ounce of water. When dry, the slab is floated on a solution of chloride of ammonium, four grains to the ounce of water, to which one and a-half grains of gelatine is added. The surface is then dried before a fire, but so as to prevent the salting solution soaking too much into the ivory. It is then sensitised, by floating or brushing, with a sixty-grain bath of ammonio-nitrate of silver, and quickly dried. On the surface thus prepared print from a negative, tone and fix in the usual way. About an hour is required for fixing the picture. The surface is then to be well washed with hot water, and placed afterwards for four or five hours under a stream of running water. Mr. Stuart observed that he had consulted several artists as to the surface obtained, and he was able to say it was quite suited for colouring on.

Mr. Macnab stated that he had also obtained satisfactory pictures on ivory by a process similar to Mr. Stuart's.

Apparatus of novel construction was exhibited, including the first set of Daguerreotype apparatus which had been used in Glasgow.

Mr. Mactear exhibited some fine pictures which had been taken in a portable tent of his own construction, and which, being placed on a child's perambulator, was very easily moved from place to place.

Mr. Robertson described the working of a dark cell, whereby eight portraits may be done on one glass. An ordinary dark cell is fitted with a plate-holder, which is circular. A piece of wood is inserted between the *slide* and the plate-holder, having a space cut like the letter V, or more correctly the eighth of a circle. When the plate is exposed only an eighth part is affected, and the cap of the lens is replaced, and the circular holder is moved round another eighth, and so on till the whole has been exposed. He (Mr. Robertson) had been induced to make such a cell from having seen a picture that had been sent home from America; and, though ignorant of the mode adopted there, had found this method quite successful.

Mr. Macfarlane exhibited a stereoscopic camera, suitable also for views, and for producing six portraits, on a half plate glass, at one sitting, which was greatly admired.

The names of five new members were proposed by Mr. Stuart, to be balloted for at the next meeting, to be held on Thursday next, the 3rd instant, which will be the last of the session. It is expected to be an interesting one, papers on important subjects having been promised.

The meeting separated, after passing a vote of thanks to those gentlemen who had contributed papers and exhibited apparatus.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held on Tuesday evening last, the 24th ult. Mr. Haines, one of the Vice-Presidents, occupied the chair.

The usual paper was one *On the Fothergill Process*, and was read by Mr. Alfred Keene, of Leamington. [See page 129.]

The specimens referred to in Mr. Keene's paper were many of them very fine, and afforded the Society much pleasure.

On the motion of Mr. Brown, seconded by Mr. Morris, a vote of thanks was passed to Mr. Keene for his kindness in furnishing the paper; and his friend, Mr. Robinson, of Leamington (the well-known "composition" photographer), being present, promised to contribute something from his experience and skill at a future meeting of the Society.

Exhibitions.

LIVERPOOL SOCIETY OF FINE ARTS.

EXHIBITION OF PAINTINGS, ENGRAVINGS, AND PHOTOGRAPHS, AT THE QUEEN'S HALL, LIVERPOOL.

For the first time, we believe, paintings and photographs are here exhibited together, the council of the Society of Fine Arts having devoted a compartment of its rooms to photographs. This department of the exhibition is purely photographic, coloured and touched pictures having been declared inadmissible, as well as copies of pictures. With the first resolution we cordially agree; but at the Manchester exhibition copies of paintings formed one of the most interesting portions, and it is, in our opinion, a legitimate application of science to art.

The specimens exhibited number about 250 or 300, but as they are not numbered or catalogued we are sometimes unable to ascertain either the subject or name of the artist. Altogether it is a very satisfactory exposition of the present state of the art in this country. The printing of nearly all the pictures shows a marked improvement, and their circulation may tend to disabuse the public mind as to the instability of photographs.

The collodion process, wet and dry, with its various modifications, is well represented—indeed almost to the exclusion of all others; for we believe Mr. Helsby's daguerreotypes and Mr. Duckworth's calotype and waxed-paper pictures are the only exceptions.

Rejlander's and Robinson's pictures attract much attention, being almost the only representatives of artistic photography in the collection.

Mr. Rejlander has sent three new subjects, prepared expressly for this exhibition, two of which are named *Do it Again!* and *Twinkle, Twinkle, Little Star!* The expression of innocent child-like glee in the one, and of calm placid wonderment in the other, are rendered in a manner which we had thought almost beyond the power of photography. We can only compare them to the beautiful pictures by Sant, the pre-eminent painter of children. We do not remember to have seen anything more calculated to impress upon us the capabilities of photography in the hands of a real artist than these two pictures.—*Shell your Coat, Sir?* is a piece of broad humour levelled at the Volunteer movement.—The exhibition of pictures such as the above is calculated to raise both photography and photographers; and the public generally, and photographers in particular, owe a deep debt of gratitude to Mr. Rejlander for his labours in this direction.

F. Frith's pictures of *Egypt and Palestine*, including the *Panorama of Cairo*, about ten feet long, occupy a prominent position; but as they have been so recently noticed in our pages, they will not need further comment.

Mr. Mudd has sent his prize picture, *Coniston Falls*, and we think three others, but they are not numbered or named.

R. Fenton exhibits a few choice specimens. His *Mill at Hurst Green*, and *Salmon Leap on the Ribble*, are two of the most exquisite pictures we have seen. His *Interiors of the Refectory and Sodality Chapel, Stoneyhurst*, are also remarkably fine as specimens of manipulation.

A series of *Views of Furness Abbey*, by William Keith, are very good, clean, sharp, and well defined, although some have a slight tendency to hardness. We have hitherto only known Mr. Keith as a positive operator, but his pictures show that he need not confine himself to that branch of the art. The *Arch in the Cloisters* we consider the best of his productions.

F. Bedford exhibits a series of *Views of Chester and Wales*, fully equal to his former works. It is interesting to notice the individuality which attaches itself even to the works of different photographers, as well marked as the touch and style of an artist. Bedford's *Miner's Bridge* is a striking contrast to Fenton's.

The pictures by J. H. Morgan, of Bristol, are already well known. The best exhibited here are *The Salmon Trap, The Water Mill*, and *The Well on the Beach.*

Mr. Duckworth has contributed nine waxed-paper and calotype pictures of temples and scenery in India, and Mr. W. G. Helsby

above fifty large daguerreotypes illustrative of the scenery, architecture, and ethnology of Tahiti, Copiapo, Chili, and Bolivia.

The fair sex is not entirely unrepresented. Four *Views of Conway and Carnarvon*, by a Liverpool lady, are quite up to the mark. They are by the Fothergill process, and are very finely printed.

Mr. Rosling has sent two frames, which have already been noticed.

The portraits exhibited are below the average of what we have been accustomed to see in London and elsewhere.

Coming so close upon the London exhibition we cannot expect much novelty; but for a provincial exhibition, or rather part of an exhibition, it will well repay a brief inspection.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

Turn once more to your model and examine with care the high lights of her charming face. Are they warm or cold? Now, nearly all, if not all, teachers will tell us they are warm, therefore you must receive my statement with all due caution, when I tell you that, on the contrary, they are cool, if not cold.* I put this assertion forward with some little hesitation (although I have reached this un-orthodox conclusion through a long and studious observance of nature), because I am opposed therein by high authority. Still, flesh certainly partakes of the nature of polished surfaces, the high lights of which are admitted to be cold. Without dwelling upon the point, however, I will merely recommend you to seek the truth where that quality ever exists, although there it is not often sought for, viz., in nature.

Having devoted so much study to the model herself, you probably turn to your work with a feeling of despair, hardly daring to hope that with mere pigments and paper you can approximate, however remotely, the exquisite delicacy of the lady's complexion; and as your eye recognises the infinite variety of tones, tints, and shades of colour which compose the shadows and half-shadows, demi-tints, greys, purples, and violets, you perhaps wish you had not undertaken so difficult a task. Now, I hope you have these feelings of despondency (unpleasant though they may be);—they are glorious signs, harbingers of bright hopes, and heralds of the highest order of success. But, if you have them not, why then you will be more comfortable in your mind, and that is a blessing too—is it not? In the first place, you will think with me that photographic colouring is really artistic, and demands genuine study and perseverance. In the second place, you will think, with the author of *A Guide to Painting Photographic Portraits*, that "the process of colouring photographs is by no means so difficult a matter as you might at first have apprehended. There are certainly some obstacles to be encountered, but they will soon be overcome," &c. As a rule, however, early beginners are much inclined to think it is remarkably easy (and discover their mistake afterwards) rather than the reverse, and I therefore warn you to prepare for the difficulties you will inevitably encounter. The man who goes unarmed into a battle-field, thinking his enemy will fly at his approach, is likely to find himself speedily conquered.

THE PAINTING.

The process I am about to describe is one essentially adapted to the beginner.

With a faint wash,† composed of madder pink, slightly modified with a very small portion of Indian yellow, go over the whole of the flesh. In doing this, charge your brush with sufficient colour to complete the wash without a pause, otherwise it will be irregular, and assume the appearance of hard edges in the most undesirable places, which you will not easily get rid of. Next take a little Indian yellow and Venetian red, using but a small proportion of the former, and strengthen your flesh-wash by hatching upon it, leaving the high lights untouched. Now strengthen all the lines, such as the eyelids, division of the lips, nostril, &c., with Indian red, either pure or mixed with a little lake; or should the same be very black in the photograph, with pure vermillion, used thin. Do not forget the necessity I have already so often urged, viz., that of doing all this gradually, and with faint and repeated touches.

* I quoted in the maxims some brief directions given by Rubens to his pupils, as transmitted to us by the Chevalier Michel. "Paint your lights *white*," said that great master (see maxim), and then adds, "Finish by passing gently over *the whole* with a brush dipped in *cool grey*." Now this would certainly render the white high lights unmistakeably cool.

† Washing, hatching, and the other technicalities here used, have been fully explained in the preceding chapter.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

N. S.—I should have answered this correspondent before now, but have mislaid his address.

Miss G.—Never lose the outline, for if you cannot restore form your only plan must be never to lose it. The lights are not in the right places for a similar reason. Not much progress since your last reached me; but persevere. I would not advise upon such a point without sufficient knowledge of the photographer in question.

J. P.—The glass positives have an opaque, and consequently light background, which is darkened in the colouring; the drapery is then painted, shade for shade, and light for light, on the back of the glass, in water or oil colours, and on the front in the usual way with powder colours. I have seen excellent effects so produced, but the process demands some artistic skill and great care.

A. G. Hetherington.—Cover the window panes with silver paper, or something as thin and transparent; this will modify the strong sunlight, and enable you to paint without shifting to another room. Near the face the background should be neither as dark as the shadows nor as light as the high lights, as, in either case, one or the other would become enfeebled, and the head consequently lose roundness and vigour.

Chromo—Ann Page—A Grateful Pupil.—The first of these correspondents, taking up the idea of the second, having stated that he is not in a position to pay for private lessons, says, "What do you think of announcing that a class would be formed upon certain terms when a sufficient number of names were obtained?" I am thinking over this hint, and if I receive any further correspondence thereon, an advertisement shall be inserted in this Journal, stating terms, &c.

A Lady Amateur.—You evidently use your colours too liquid. The hatching is hardly bold enough, and so produces a scratchy, poor effect: the touches should be broader to secure that "mellowness and softness" so characteristic of a good water-colour picture. Keep your colours pure and bright, as, although you may always tone them down afterwards, you can never restore their lost brilliancy. Soft square pointed brushes are best for body-colours, as they do not stab and drag up the surface as finely-pointed pencils would.

A Photographer.—The process is a secret in the possession of its inventor, Mr. H. L. Keens, of Maria Villa, Culford Road, Kingsland, by whom the pictures you have seen were coloured. They are not peculiar to the establishment you name, inasmuch as Mr. Keens occasionally executes work for my own and many others. You see, therefore, why I cannot comply with your request. Many colourists work in body colour with water, and give them an appearance of oil by varnishing with Chenie varnish: *a few* describe them as oil. A friend of mine endeavoured to clean one of these so-called *oil* pictures with water and removed all the colour. I think they are most permanent in oil. The silica colours are manufactured by Miller, of Long Acre. I have not tried them.

Novice.—Any of the transparent blues, lakes, and browns will, when mixed, form an excellent transparent black. The sensation produced by the harmonious arrangement of colours must always be dependent upon the healthy or morbid state of the organs through which such impressions are conveyed; but the rules upon which harmony are based (imperfect as they may be) have none the less value for that fact. You must not forget that there are various descriptions of harmony—some dependent upon the abstract quality of colour, others belonging to the arrangement of colour in connection with *chiar'scuro*. Nor is this all; for unless such harmony also accords with the subject, the mind immediately detects discord. I have seen glaringly discordant colours rendered almost harmonious by the skilful treatment of light and shade, and harmony of colour and *chiar'scuro* positively offensive because at variance with the subject. Chevreul's work is, I believe, the only book published that clearly demonstrates the principles of colouring. A great authority said, "that by dint of hard and close application to painting a person may become a good draughtsman; but that the science of colouring is the gift of nature, and cannot be acquired by study." Now I do not believe the latter part of this quotation, but it would occupy too much space to tell you why.

Obituary.—Photography has sustained a loss by the death of Mr. M. Sparling, late assistant to R. Fenton, Esq., in the Crimea. He died at Liverpool, on the 20th ult., of inflammation of the liver and pelvic abscess.

Foreign Correspondence.

Paris, April 25, 1860.

The Ethics of Photography are yet unwritten. It is not yet decided whether a photographer, whom you employ to obtain a "counterfeit presentment" of your visage, is at liberty to employ the negative for his own private advantage or not. You may be poet, painter, philosopher, statesman, or what not, and desire, for family considerations, to obtain a good photographic portrait of yourself, without the remotest idea of the publication of the same—in fact, you may be averse to such publication. Well, you go to a photographer, and sit and bargain for so many impressions; but the artist keeps the negative, which many consider they have a right to do with as they think proper. Next week, perhaps, you may be astonished to find yourself (I mean your portrait) in all the shop windows, to your infinite annoyance. You proceed to the artist, and remonstrate with him. He takes it very coolly, says you are a public character, and that your portrait is public property, &c.; but you cannot convince him that he has been guilty of any impropriety, or of any breach of confidence. You wish him to withdraw your portrait from public exhibition and sale: he declines; but you think the law on your side, and resort to its aid to compel him. But you are soon convinced of the glorious uncertainty of the law, even if you had any doubts before. Most likely the jury will pronounce against you, and the photographer will go off triumphant.

An interesting case, *à propos* to this question, came before the courts lately, the result of which has created no little excitement among the members of the photographic profession. It may some-

times happen that you are yourself willing that your photographic portrait should be accessible to the public. But you may die: what if your heirs, executors, &c., object to that which you approved of? Here, indeed, is a knotty point, which was curiously unravelled lately, in the case of the late eminent poet, Adam Mickiewitz. He had authorised M. Szweyer to take his portrait, and sell it; but, since his death, his heirs have wished that the sale should be stopped, and they appealed to the courts for the necessary power to do so. It was argued that public characters do not surrender their private rights in becoming public; that the one is entirely distinct from the other: the domestic fireside is sacred to them as to others, and their appearance in the forum, in the pulpit, or on the stage, is an existence apart, and totally distinct. A man who has lived in the blaze of notoriety may yet desire to die in obscurity, and has the right to conceal his dying bed from public gaze. The portrait of a person cannot be publicly exhibited or sold without the formal consent of the said person, nor after his decease without the consent of his family. And, moreover, when a person whose portrait has been taken, has authorised its being exhibited and sold, his family can, after his decease, oppose this exhibition and sale, if it be disposed to do so. Such is the law, and the court awards it.

This may appear like pushing family rights to extreme limits, and it is not likely that the legal principle established will be at all agreeable to photographers. The features of eminent men sometimes throw much light upon their character and actions. To the anthropologist an authentic portrait is worth more than the best biography ever written. To deprive the artist of the right to present to the eyes of posterity the features of those who influence the destinies of the world is a harshness which is prejudicial to society, without being a benefit to anyone. The pages of Carlyle are not more eloquent or informing to the thoughtful eye than the portrait of Cromwell that prefaces his volume. From the robust, square, and massive frame, thick lips, large forehead, arched brows, and eagle-glance, the lion's head and mane, of another of that writer's idols — Mirabeau — we can well divine the passions and eloquence of one who swallowed all formulæ. A good photograph of our Shakespeare would be worth more to the world than all the gold products of California. The lineaments of a great man are as much public property as his deeds. His face is as a book wherein we may read his true character. J. P.

New Books.

Instantaneous Photography, Mathematical and Popular, including Practical Instructions on the Manipulation of the Pistolgraph.
By Thomas Skaife.
(London: J. Hogarth, 5, Haymarket.)

There are but very few practised photographers who do not appreciate the advantage of a very short exposure in the camera; hence we may safely predict that the little pamphlet before us will be pretty extensively read even by those who do not propose to themselves to put in practice the precepts given, for there is something of interest attachable to the idea of *instantaneous* photography, even by non-photographers.

We presume that there are but few persons who will be disposed to question the right of a parent to name his own child; but whether the world will always adopt a designation that may be conferred by the said parent, without any regard to convenience or propriety, is quite another question. We are induced to make these remarks in consequence of the very barbarous word coined by Mr. Skaife as a name for his ingenious little *camerette*, but which he calls a *pistolgraph;* and we cannot forbear recording a protest against such a hideous and unscientific compound, and a still stronger one as regards the word *pistolgram*, which Mr. Skaife applies to the small photographs produced by aid of his instrument, and which appears to us to reach the culminating point of cacophonous photographic slang, surpassing even the original corruption, *stereogram*, and without the excuse that can be urged in defence of such expressions as — old hypo' — *et hoc genus omne.*

If the instrument had been as bad as its name, we should not have troubled ourselves with any notice of it at all; but the very reverse is, in fact, the case: the apparatus is very ingenious, and its productions truly charming.

The lens employed is very similar in construction to the ordinary portrait combination, but having a much shorter focus, and is of about one inch in diameter. To the front of the lens is attached a pair of Skaife's patent shutters, which open outwards, and which, by an extremely ingenious contrivance, are made to open and close again by merely touching a small trigger, so that the exposure (which can be regulated to any desired fraction of a second of time) may take place at the exact moment selected by the operator.

These shutters have already been described in our volume for 1858—it is, therefore, needless to repeat the description; but, as an instance of the excessive rapidity with which they can, if desired, be made to open and shut, we may state that we have seen a small pair, such as are used for the instrument we are now describing, which absolutely were made to go through the operation without the eye being able to detect any movement, unless the shutters were held between it and the light, when the flash of light became perceptible. For all the details of manipulation we must refer our readers to the pamphlet itself; but of its productions we have a word or two yet to say.

We have before us a scene on the river Thames, taken on glass (of about a square inch, or rather less, in dimensions), and embracing the "reach" of the river visible from Greenwich. On the right is a landing place, with several wherries and other small craft afloat; on the left the foreground is occupied by a fishing smack at anchor; the centre is filled by one of the Diamond funnel steam packets approaching the pier, on the paddle-box of which the master is seen directing the steersman, who is also visible at the stern of the vessel, while the deck is occupied by an assemblage of passengers. In the distance are numerous vessels, and a house or two of the town of Greenwich; and each rope and spar of the vessels, each ripple on the water, is as sharp and defined as can be desired.

We have also a likeness of Sir David Brewster, mounted as what Mr. Skaife designates a chromo-crystal, a method applicable for mounting likenesses for bracelets, brooches, &c. It consists of a small glass positive, attached, by means of a transparent cement, to a piece of dark-coloured glass of any desired hue, — the impression being thus protected on both sides by glass from injury. By this arrangement a whole gallery of family portraits can be worn as a pair of bracelets.

In conclusion, we may cite, as an example of the definition attainable by Mr. Skaife's instrument, that we have a copy of the entire front page of *The Times* newspaper for 15th June, 1859, reduced in dimensions to about half an inch by three-eighths of an inch, and in which the whole of the advertisements are readable by aid of a powerful lens.

The Photographic Teacher; or What to do in Photography, and How to do it.
By G. Wharton Simpson. Sixth Edition.
(London: H. Squire & Co., King William Street, London Bridge.)

This is one of the initiatory handbooks that we remember to have noticed favourably on a previous occasion, so that it is needless to recapitulate its advantageous points. Though we do not pretend to endorse all the recommendations therein set forth, we believe that most of them are *approved* by some authorities, and at any rate can safely affirm that the trifling cost of the work will be well incurred by beginners in the art of photography. The manipulatory details of the alabastrine process will be found in this little manual, as also a chapter on colouring the same. There is an appendix to the former editions, containing short accounts of various convenient operations, &c., such as how to transfer collodion from glass to leather, how to take positives on talc or mica, so as to be readily cut for mounting in brooches, &c., how to form vignettes, and sundry other scraps of information.

Correspondence.

NO FOCUSSING.

To the Editor.

Sir, — Noticing the discussion at the Photographic Society on the panoramic lens, I am induced to send you the following extract from the letter of a brother photographer:—"At Abbotsford a queer thing happened to me. It was getting late, and I wished to take one view of it. Being in a hurry I focussed hastily. The distant mountains are *beautifully sharp*, but the house is all out of focus. I think the house could not have been less than sixty yards off. A pretty good fact this against a no-focussing theory and lens."

Any comment is superfluous.—I am, yours, &c. X.

London, April 24, 1860.

CHLORIDE OF SILVER.

To the Editor.

Sir,—1. A print taken from the pressure-frame allowed to remain in cold water, after a time the water becomes cloudy: what is the *silver* in solution?

2. On adding a few drops of strong liquor ammoniæ it *instantly disappeared*, and the water became *perfectly clear:* what changes took place?

An answer would much oblige. Yours, &c.

AN OLD SUBSCRIBER.

[1. The cloudy appearance is attributable to the formation of *chloride of silver*.

2. That body being soluble in liquor ammoniæ accounts for the clearing of the liquid on your adding that reagent.—Ed.]

"QUANTUM EST IN REBUS INANE!"

To the Editor.

Sir,—Will you kindly permit me to ask Mr. Hart who authorised him to take up the duties of Inspector-General of His Majesty King Public's Photographic Establishments? why he assumes that they all exist in "the city?" and who informed him that every photographer closed his establishment when his printer or operator had taken a half-holiday?

As the proprietor of a city photographic gallery who cannot, in justice, be accused of being indifferent to the advancement, comfort, or health of those in my employment, I must step forward in censure of such unwarrantable conclusions as this writer draws from his comically imperfect observation. His description of traversing the city instead of the west end; his melo-dramatic exclamation of, "when, what did I behold?" and his ingenious plan of introducing an indirect puff in favour of the "noted firm," were as amusing as his sage assertion that "in any place worth calling a photographer's there is always an operator and a printer." I derived some amusement, also, from finding that the men who, after *one* day's rest, would return to their work with "a half sluggish air," would, according to his statement, return with great "freshness and energy" if they only had a day — *and a half.*

With all his apparent love of art, it is strange that Mr. Hart should overlook the fact that one of the first collections of pictures in Europe—that at Kensington—is opened free after dusk. For my own part, I should suppose our operators and printers would be more inclined to recruit their health and energy in *the fresh open air* than to devote their little leisure to close or crowded picture galleries, for the sake of study, which they would pursue to very little purpose if they had not previously made themselves acquainted with such principles and rules of art as may be acquired from books read in those long winter evenings at home which the photographic operator possesses, but which so many thousands of his fellow-labourers in other professions and businesses yearn for as a priceless but quite unhoped-for boon.—I am, yours, &c.,

A CITY PHOTOGRAPHER.

MOUNTING PRINTS—GOLD TONING.

To the Editor.

Sir,—Will you kindly inform me of the proper way to mount prints? I find the gum, although I use it very thick, comes through to the surface, occasionally bringing with it the colour of the mount. I also find the mounts of ten by eight inch pictures curl up to a great extent, even after being subjected to a pressure of about half a ton, by means of a very powerful screw press: in stereos the curling is not so objectionable.

Can you suggest any cause for the alkaline chloride of gold bath in toning, by which I have hitherto been very successful, suddenly, within the last few weeks, failing altogether to give a good colour? The solution of gold (unless it can have become decomposed in any way), is the same as I have been using with success, as is also the paper, but now the colour always changes in the hypo to a dirty brown, which is not altogether removed by the application of heat in drying.

I am, yours, &c. AN AMATEUR.

[Gum water has a tendency to penetrate photographic paper, which, after the necessary washing, is very apt to have a considerable portion of the sizing removed—a condition that may be recognised by holding it up to the light while wet, when transparent patches will be evident. Any aqueous solution also tends to make the mounting board curl up—unless it too is previously damped, so that, on drying, both the print and the mount shall shrink equally. The removal of the size may be rectified by floating the print on a solution of gelatine in hot water (three or four grains to the ounce) and hanging it to dry.

For mounting—try a solution of india-rubber in naptha (procurable at the shops); apply with a stiff brush to the back of the print, scrape off the superfluous liquid with a flat-edged piece of metal or glass, the proof being placed face downwards on a plate of glass the while; then place the print on the board in the same way that you would lower paper on a sensitising solution; press, and when dry remove any cement that may have oozed out with a piece of india-rubber, which does it effectually and simply. The print cannot safely be re-adjusted after it is once lowered on to the mounting board.

Alkaline chloride of gold will not keep long after being mixed, the gold becoming reduced. This is no doubt the case with your bath. Remedy:—Mix it only in small quantities at a time, when about to use it. Read Mr. Hughes's paper in a recent number of this Journal.—Ed.]

DISORDERED NITRATE BATH.

To the Editor.

Sir,—Will you have the goodness to inform me in your next what I must do in order to get rid of acetic acid in the bath, so as to use nitric acid instead? I have generally understood that the two acids should not be employed simultaneously; yet, in some directions which I have by me, it is first said—add so many drops of acetic acid to each pint of nitrate bath, &c., and further on, minute directions are given for correcting the bath with nitric acid.—I am, yours, &c., A. Y. V.

[When once acetic acid has been added to the bath, you will find it difficult to eliminate it, and to bring the solution back to the same state as before; for if the acetic acid be neutralised with an alkali, then an *acetate* will be formed, and produce its characteristic effects. Acetic acid is a volatile substance, and therefore it might be supposed that by evaporation it would be entirely expelled. To say nothing, however, of the uncertainty introduced by applying heat to a solution containing nitrate of silver and also organic matter tending to reduce that nitrate, it is always difficult to expel the last portions of a volatile body from its solution in another liquid. At present, therefore, we are disposed to advise you to work the two acids together, if you really require the retarding effect of the nitric acid.—Ed.]

THE CENTRAL SPOT.

To the Editor.

Sir,—1. Seeing your notice of "Onward's" explanation of the cause of the "foggy spot" on negatives taken with a portrait combination, when the stop is placed between the lenses, I could not refrain saying a word or two as to the improbability of either your own or "Onward's" being the correct explanation. That the "foggy spot" is an image there cannot be any doubt, but that it is caused by reflection from the surfaces of the lenses is preposterous!

2. Neither can it arise from the shade in front, which can be shown practically by removing the shade; the "spot" is still there (?).

3. When it projects too far, the picture on the screen diminishes gradually in luminosity from the centre to the edges. In this case the spot has a tolerably well-defined outline.

4. You say, that "to form an image the diaphragm itself must be capable of readily radiating light." It does radiate light. By the diaphragm I understand the space or area within its circumference, and I maintain that we have, on the screen, a representation of this diaphragm by radiated light—probably not perfect, because not necessarily in focus, and not wholly, or perhaps not very visibly, represented, because coated with black, except the aperture which is light, and consequently represented.

5. The front lens pictures on the glass everything before it; why should the posterior lens skip, as it were, over everything in the interior, and only begin to picture the objects outside the anterior lens? There is an aperture, circular or otherwise, and if the "foggy spot" is not an image of it, where is its image? I feel persuaded that everything, whether diaphragm, aperture, or lens, placed before the posterior lens, is represented by it according to the light radiating from such object.

I am, yours, &c., C. B. GREEN.

[1. Our correspondent has a perfect right to feel dissatisfied with our explanation of the "foggy spot," as well as of that of any other expounder, and to express his objections we are willing to afford him an opportunity; but, when alluding to others than ourself, we should prefer his using some milder term than "preposterous." The editor may be "hit hard," upon the presumption of his "having no friends." 2, 3. These paragraphs directly contradict one another. 4. Not very intelligible. The *diaphragm* is the piece of metal in which the aperture is pierced, through which the rays pass, and, in the supposed case before us, is placed between the lenses of a portrait combination. If, then, the diaphragm radiates light it is improperly constructed; it should be made of a dead black, so as *not* to radiate light (perhaps the word reflect would be better understood than radiate, but is not strictly correct). 5. The proposition is too general. No lens can form an image of anything that is nearer to it than its principal focus; the diaphragm, being between the lenses, is clearly, of necessity, nearer to the posterior lens than its solar focus, hence it is impossible that any image of its aperture can be formed by the posterior lens.—Ed.]

PHOTOGRAPHER'S HALF-HOLIDAY.

To the Editor.

Sir,—I have read the letter in your last on this subject, and have taken breath after it. After a second effort I think I almost understand what the writer means, notwithstanding his odd jumble of antecedents and relatives, and utter disregard of grammatical construction. If I understand him, he wishes to receive six days' pay for the labour of five days and a-half.

But, sir, I fancy operative photographers will be much tempted to exclaim, "save me from my friends!" for if the arguments of "J. Hart" be the best that can be advanced in support of the weekly half-holiday, the case is, I fear, a bad one. Mark the first conclusion which flows from his argument. All the operator "requires is that four or five hours on a Saturday be awarded him by his employers, for the purpose of visiting those places of instruction and amusement," &c. It is not then the duty of the operator to be qualified by education and habit for the efficient discharge of the duties of his profession before accepting its emoluments, but it is the duty of his employers to bear the expense of such education. Again, mark how conclusive the next argument is: at the termination of his weekly labours the operator has an interval of forty hours for rest, but he returns to duty "on Monday morning with a half sluggish air;" extend the interval to forty-four or forty-five hours, and he is to be imbued with life, energy, and—art!

The connection between photography, or a photographer's half-holiday, and the magniloquent periods about "foreign climes," "sunny Italy," "grand ideas," &c., I fairly confess I cannot understand, nor how a "profession" can constitute a "tomb."

I remember a quaint old saying to the effect that "there is a great deal of human nature in mankind." Remembering this, I think such letters as that of "J. Hart" are calculated to retard rather than advance the half-holiday movement. Employers do not feel they have any right to be held up to the scorn and execration of such an extensive public as read The British Journal of Photography, simply because they do not, the first moment it is suggested, give to each of their operators what would be equivalent to an annual present of eight, ten, or twelve pounds sterling. The absurdly puffing mention of a single firm is equally injudicious. We have it, sir, on high authority, that "comparisons are odorous."

Let us by all means, sir, have the half-holiday, either on Saturday or any other convenient day; but let it be honestly regarded as a boon, a goodwill offering on the part of employers, and I believe there will be found operators grateful and conscientious enough to repay their employers in the extra effort and care which will result from a sound mind in a healthy body.—I am, yours, &c.

A PHOTOGRAPHER IN THE CITY.

P.S.—I have some doubt whether your correspondent is or is not a wag, enacting the Spartan Helot or "awful example," exhibiting his own deplorable need of a weekly half-day for grammatical instruction, and referring to the "pictures which few equal and none surpass" to show the extremely low *calibre* of his own art-culture.

PHOTOGRAPHIC GOSSIP.

No. I.

To the Editor.

Sir,—In a recent number of The British Journal of Photography appears an article by Mr. Forster *On Gum as a Preservative Agent*, and it has been lately re-suggested by Mr. Hardwich for that purpose. As Mr. Forster's experience is similar to mine, a short gossip on the subject may not be out of place.

He complains of "marbling" or "brain-like markings." I should like to know exactly what these are, never having met with what I designate by these terms in any other way than by careless development in allowing the developer (pyrogallic especially) to remain stationary for too long a time. I have not, however, been able perfectly to overcome certain marks resembling *watered silk*, or a series of concentric rings formed in drying. This is more especially the case when using a firm collodion, but with a rotten film the difficulty does not appear to nearly so great an extent. The blistering to which Mr. Forster alludes arises, I think, from his using his gum solution of *far too great a strength*. I have never been annoyed in this way. Mr. Hardwich in No. 1 of his "Photographic Comments"—a series of papers which I am sure will be of great benefit and interest to photographers—recommends that the gum should not be washed off, but allowed to dry on the surface of the film. By this method the chance of blistering would be increased. In my trials I have thoroughly washed, first, to remove the free nitrate of silver, and, secondly, the gum. Mr. Forster states the keeping qualities of the plates as rather limited. Let him add a portion of albumen, an acetate or citrate, &c., to the gum solution, so as to convert any remaining free nitrate of silver into an insoluble salt, and he will find less difficulty in this respect.

Mr. Keene, in a letter to a contemporary, mentions that a plate coated with albumen, and dried, collodionised and sensitised, and afterwards well washed, is nearly as sensitive as a Fothergill plate. This is almost exactly the process as practised by Mr. Barnes. I believe it to be good, and may have a word to say on the subject hereafter. The plates will not keep.*

I next turn to panoramic photography, as discussed at the last meeting of the Photographic Society. From the first it appeared very evident that the feeling of the meeting was strongly against the subject—or perhaps I might say against Mr. Sutton. Many came there who had decided on their verdict before hearing a jot of evidence. Some who spoke against it did not even know the principles on which the lens was constructed. You yourself, Sir, pointed out the fact that the apparatus was original, and not a combination of M. Martens's panoramic camera and Archer's fluid lens. I speak thus plainly because I consider Mr. Sutton did not get fair play. It was "hit him again, he's got no friends." Why was this? Evidently that gentleman has forgotten that photographers living in glass houses should never throw stones. His *energetic* remarks sometimes amuse, but often irritate. Sometimes he forgets the gentleman, and then ——! Nevertheless, all personal feelings should be ignored in so important a discussion; but this I am more than afraid was not entirely the case here. For my part I have faith in the lens. I do not expect its performances nearly to come up to what its enthusiastic inventor promises; but that it can produce good results, at all events from rural scenes, we have what I consider proof in the view looking up the path leading to St. Brelade's Bay. The lens will be a favourite with the artist, whatever it may be with the photographer; and in this opinion I am supported by my friend Mr. Wall, whose excellent articles in your columns, on artistic colouring, prove him to be no mean authority. It is usually the custom for societies to pass a vote of thanks to the authors of papers read at their meetings, but I do not remember its being done in this instance. If omitted, it was evidently unintentionally so.

The remarks made at the same meeting on burnt-in photography were very interesting. The experiments given in the paper read by the Secretary do not appear to me to have been made in the right direction, inasmuch as they are founded on one of the carbon printing processes, wherein the picture is produced by *mechanical* instead of *chemical* action. The same subject, you will remember, was previously mooted at the last meeting of the North London Photographic Association, and I am experimenting on some of the processes for printing in various metals, given by Hunt, and more recently by Burnett. What are the colours obtained from different metals on their being burnt into glass, &c.? I shall be glad of information on this point.

Mr. H. P. Robinson has read a ridicul—— singular paper before the Photographic Society of Scotland, *On Printing from Several Negatives.* He says, "Art can be extracted out of almost anything." I don't doubt it. "A Hunt, inspired by a Ruskin, can make a picture from an oyster-shell." Very true, Mr. Robinson; *but he makes it look like an oyster-shell.* Would he throw up a tank in his "small back yard" to serve as a model for "the top of a mountain?" Or would he copy a small stream of water from "a print-washing apparatus," and call it "a river?" No, Mr. Robinson, it is not at all "singular that so little has been done in this branch of photography." I certainly advocate printing from several negatives, but let them be legitimately obtained.—I am, yours, &c.

MICHAEL HANNAFORD.

[Our lively friend surely cannot "live in a glass house," because he is clearly not very particular about the direction of the stones which he throws: they seem to be cast north, south, east, and west, and as we get our share, we presume our friends will not think we treat them shabbily in publishing the preceding letter. We do like fair play, and for every one to have a hearing, opponents as well as allies, and so we will not, at any rate for the present, reply; but, to prevent misapprehension, we will simply remark, that we dissent *in toto* from a considerable portion of the opinions above expressed.—Ed.]

* [Mr. Keene favoured us with a duplicate copy of the letter alluded to, but as there was nothing in it that we had not published long since, we did not think it needful to repeat the matter. Our present correspondent, however, errs in supposing that these plates will not "keep."—Ed.]

Case of Fatal Poisoning.—We regret to have to record the death of a son of Mr. J. A. Stennett, photographer, of Chester, a child not two years of age, occasioned by drinking a solution of bichloride of mercury which had been left upon the floor of the operating-room.

ANSWERS TO CORRESPONDENTS.

J. P.—We published it more than twelve months back.

Viator.—If you do not like a tent, why not try some of the dark boxes so ingeniously contrived?

Nemo me impune lacessit.—Fair criticism we never hesitate to publish, but anything spiteful we prohibit. Send us what you propose, and we will consider of it.

T. B.—To clean glasses that have the collodion dried on them, we find a little old spoiled collodion one of the simplest agents to employ for the purpose.

Caleb I'Anson.—You will find that a double combination lens is a nuisance for field work—particularly if you require pictures ten by eight inches in dimensions.

Margaret.—Print on albumenised paper, and tone with gold, by the process recently published by Mr. Hughes, or by Maxwell Lyte's formula.

W. B. C.—Dr. Hill Norris's process has been patented, and we are not at present in possession of such information as would enable you to prepare plates exactly similar to those supplied by the firm.

R. T. Dick.—The manufacture of positive collodion does not present the same difficulties as that of negative collodion, and you will find no difficulty in obtaining it of the best quality. The maker you speak of, for lenses, has been successful in some of his attempts, as we can testify.

I. W.—Perhaps you will succeed better if you warm your toning-bath by placing the vessel in a dish of hot water for a few minutes. The temperature will only require to be raised to sixty-four or sixty-six degrees.

Inquirer.—We could not in fairness to our subscribers occupy space with such an article as you desire, which, though interesting enough to those engaged thereon, is certainly not in any way connected with photography that we can perceive.

Transit.—We have never examined the varnish to which you allude, but should think it is probably composed of mastic dissolved in benzole. It is not generally advisable for photographers to make their own varnish, though they should know *how* to do it. Gum *benzoin* may possibly be suitable for your purpose, or gum dammar.

A Manchester Amateur.—We are not aware that Mr. Mudd has any peculiar kind of aceto-nitrate of silver bath, but would not your simplest plan be to call personally upon him? Almost any collodion will do for the process named; in preference, probably one made after the formula of Mr. Hardwich, recently published in our columns.

J. Cunningham.—A dry plate by Dr. Norris's process will do exceedingly well. Expose under a negative in the printing frame by just *showing* it to the light for an instant, and develop with pyrogallic and citric acids, of course adding a few drops of solution of nitrate of silver. Citric acid does not bring out the shadows better, but produces a more agreeable tone than acetic acid.

John Reynolds.—The dimensions of your moveable screen must depend chiefly upon your own convenience. Seven feet high by five in width for the back, would be a minimum size. The sides may be seven feet by three feet, and the top three feet by the width of the back. If you can find place for stowage, you will find eight or nine feet wide for the back preferable, as it will then be suitable for groups as well as single figures.

An Amateur.—Perhaps it will be hardly safe at present to rely upon the papers you name, which were given more in the way of experiment than of complete research. The mucilage of linseed has been employed successfully in the dry processes, and, although we have not ourselves used it, we are of opinion that it promises well. With reference to the methods of washing Fothergill plates, why not try them both, and ascertain for yourself which is most suitable for the collodion which you employ?

Beginner.—You must not expect to obtain such rapid results in a glass room as when working in the open air, for all ordinary glass, from its colour, &c., impedes the light to a greater or less extent. 1. If you use the room for portraiture only, you need not alter the east side at all, and certainly not the door. As one side of the sitter should be shaded, the light reflected from the *pale*-blue east wall would afford sufficient illumination on that side. 2. It would be an advantage to glaze the entire *west* gable, and to add two more glass panels on the same side. 3. Do away with the gable *b*, and make your glass roof slope from the present wood-work of gable *a* to the top of your dark room, and put a lead flat over the dark closet; or remove the dark room, as you propose, and continue the glass slope to the extreme north end of your room. Arrange two roller blinds to pull up from the bottom of slope, one blind for each half of the roof.

A Little One.—You are quite right. We are always ready to afford our best advice to correspondents, and are gratified that you have received useful information. You cannot make a portrait combination and a view lens work together for dissolving views; neither will you find a half-plate double combination give you so large a picture on the screen from the same negative as a quarter-plate one. You must not quarrel with the "great guns" for abstaining from entering more into elementary principles when reading papers at the societies: their audiences are too well informed on the subjects to allow such a course to be desirable or permissible, and the papers are published just as delivered. We endeavour to supply the vacancies to our uninstructed readers when we are apprised of what they consist. Send a stamped directed envelope and we will endeavour to relieve you of the difficulty not answered here.

☞ *All* Editorial *Communications*, Books for Review, *&c., shoulp be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 118, Vol. VII.—MAY 15, 1860.

At the last meeting of the North London Photographic Association, a paper of no small interest and importance was read by Mr. George Dawson, *On the Reaction of Chloride of Silver upon the Hyposulphite of Soda*, which we laid before our readers in our last issue, and upon which we have a few remarks to offer. To meet the requirements of our numerous subscribers and agents, both in this country and on the continent, we are compelled to "go to press" at least two days before the day of publication, in order that this Journal may be included with others in the provincial and continental packages; we were in consequence unable to correct the paper under consideration after it was "in type," and in the manuscript the fact of the chemical substances being expressed symbolically escaped our attention: we therefore fear that some of our readers may be somewhat puzzled to comprehend the completeness of the demonstration laid before them by the author of the article. Under these circumstances we propose to recapitulate briefly the conclusive experiments of Mr. Dawson, by which the probable source of the error into which the eminent French chemists, MM. Davanne and Girard, were led, was discovered. It is not a little surprising, however, that these gentlemen, whose elaborate investigations relative to the cause of the fading of positive proofs upon paper have been constantly referred to in these pages, should—in the instance which gave rise to the extraordinary announcement made by them to the effect that "one quart of a new solution of hyposulphite of soda, of the strength of ten per cent., is requisite to fix properly and safely only one sheet and a-half of paper of the dimensions of 22½ inches by 17½ inches"—have entirely omitted to act in the same cautious manner that characterised most of their other operations.

It will probably be in the recollection of many of our readers that several years back a committee of English photographers was appointed by the Photographic Society to investigate the same subject, upon which committee we had the honour of serving; we are consequently well informed as to what results really were arrived at upon that occasion.

MM. Davanne and Girard, in commencing their operations, did not content themselves with taking up the matter where it was left by their English predecessors, but began *de novo;* and very properly so, for there is always a satisfaction in conducting an important inquiry by commencing at the very foundation, if only to verify what has been already ascertained. During the publication of several of the earlier portions of their researches, while giving full credit for the systematic manner in which they had been conducted, we felt called upon to record a protest against the manner in which many of the ascertained facts were put forward as new discoveries, totally ignoring the circumstance that they had been previously published in this country. It makes but little difference if it be contended that these gentlemen were unaware of what had been done in the direction in which their labours were to be exerted: they could not have been ignorant that *something* had been done; and it is a recognised principle among scientific men of all countries that in such cases they are bound to ascertain what that something is, in order to avoid the appearance of attempting to appropriate the fruits of previous researches as their own. We wish it, however, to be understood, that we do not for a moment intend to charge these gentlemen with any deliberate injustice, but we cannot acquit them of at least a disregard of the ordinary precautions usually adopted in such cases.—To return, however, to the immediate object of our consideration.

Mr. Dawson, as a preliminary experiment, ascertained that the solvent power of hyposulphite of soda for chloride of silver is not—at least in any important degree—dependent upon the actual strength of the solution; but that a given quantity of the former will act upon a definite quantity of the latter, whether the quantity of water employed be much or little.

In order to make the experiments assimilate pretty closely to the ordinary conditions under which the photographer has to operate, the hyposulphite of soda and nitrate of silver were selected of good but not absolutely pure quality; the solvent of the former being ordinary spring water, while the latter was converted into chloride of silver by precipitating it with chloride of sodium (common salt). The chloride of silver was washed, dried, and subsequently added to the hyposulphite of soda in *small quantities* at a time.

Having prepared a solution of hyposulphite of soda, of the strength of ten per cent., and divided it into several portions, to the first portion chloride of silver equal in weight to one-third that of the crystals of hyposulphite of soda contained in it was added gradually; a part of this solution exposed to the air for three weeks remained clear, and without a precipitate of any kind being formed therein. This is at least a very strong fact in direct opposition to the statement of MM. Davanne and Girard, "that hyposulphite of soda becomes saturated with the double salt when thirty-six grains of the chloride of silver are added to twenty-five of new hyposulphite."

Again: Chloride of silver was added to another portion of the ten per cent. solution till a white crystalline precipitate fell abundantly, which deposit, on exposure to a heat of 180° Fahr., quickly resolved itself into sulphide of silver. The supernatant liquor, standing in a warm position exposed to the air, decomposed into sulphide of silver and sulphuric acid; but another portion of the same liquid was kept at a pretty even temperature below 60°, *for more than a fortnight, without manifesting any signs of decomposition.*

Now, let us note carefully what follows. Mr. Dawson states:—"I saturated a ten per cent. solution of hypo. with chloride of silver, and continued adding the latter till hyposulphite of silver ceased to fall.' Part of the liquor was boiled in a test tube without the expected deposit of sulphide of silver. It then occurred to me that, if this body were absent, it (the liquor) might contain chloride of sodium only; and this surmise seems to be borne out by the few tests I have as yet had time to apply." What tests were applied will be found recorded at page 127: so conclusive however were they, that the liquid

itself was employed as a salting solution for positive paper, upon which, after sensitising in the ordinary way, prints were taken perfectly clean, and presenting the ordinary appearance of well-executed untoned photographs; and two of these proofs are still in our possession. Now, had the smallest quantity of hyposulphite of soda remained in the solution undecomposed, it could not have failed to render its presence perceptible by producing discoloration of the paper.

It is clear that the error committed by MM. Davanne and Girard was in at once adding an excessive quantity of chloride of silver and yet not enough to effect the complete double decomposition. We have little doubt that they will immediately rectify the mistake into which a very large number of photographers will be liable to be misled by the authority of names so renowned as theirs—unless, indeed, they still consider it needless to ascertain what their English *collaborateurs* are doing; in which case perhaps a few months may elapse before we hear anything more of the matter, when, judging from former experience, we may expect that by some happy coincidence, finding that their assertions have been totally misunderstood, they will limit their former statements to so and so, and detail results subsequently arrived at in consequence of pushing their former experiments to an extreme, when the surprising effect of total decomposition of the original salt (hyposulphite of soda) will have been discovered to have taken place, of course simply because they will not be at the trouble of reading the English Journals.

We cannot conclude without an expression of thanks to Mr. Dawson for so clearly proving to our readers that they need be under no apprehension about fixing their proofs in the manner recently employed by all careful photographers.

It will be remembered that we published in our number for March 15 an article on *Perspective and Distortion*—the principles then advocated being mathematically correct and conclusive; but as some of our artistic and non-mathematical readers seem to fancy that a departure from the principles laid down can be allowed *without deterioration of the result*, we publish, by permission of the writer of that article, a very satisfactory demonstration, contained in a letter sent to a friend in reply to certain objections that were brought forward in defence of a departure from strict mathematical accuracy being admissible in art. The question, however, was not one of practice, but of fact, and was intended not to deter an artist from adopting it when serving his purpose, but that he should do so with a full knowledge that it involves a departure from principles by which he is usually governed. It is a subject of much interest, and we strongly recommend our readers to re-peruse the original article before or after reading the letter in the present number.

ON THE VALUE OF COLLODION AS A PHOTOGRAPHIC AGENT.

By T. F. Hardwich.

[Read at a Meeting of the London Photographic Society, 2nd May, 1860.]

We are met together this evening for the purpose of discussing the merits of a formula for negative collodion which a Committee of your Society have reported on. It will be still perhaps in your recollection that the original suggestion for the appointment of such a Committee emanated from me, and therefore I think that I am in order in desiring to open this meeting with a few introductory remarks. There are members of our own Society, and also of other Societies, who have expressed themselves as dissatisfied with the course which we have pursued, but I think that it will be easy to justify that course on the ground of necessity. The subject was not only one of great importance, but was much in need of further elucidation. Let me take these points in order.

1. The subject of collodion was one of fundamental importance to photographers. Some doubted this at first, and conjectured that in a very short time a material would be found as superior to collodion as collodion is to paper. Several years, however, have elapsed, and nothing of the kind has been discovered. Further than this, we may affirm that the more complete our knowledge becomes, the greater the difficulties appear of superseding collodion by a vehicle more adapted to fulfil the requirements of the art; for the photo-chemical properties of iodide of silver are so much affected by the exact condition in which its separate particles are precipitated, and likewise by affinities exerted towards it by other bodies, that the list of substances available as supports for that iodide is considerably reduced. Before we can select any film, it must be decided that it has certain facilities for penetration by liquids, and that the movement of the particles of iodide will not be interfered with by reactions other than neutral, such as many bodies, organic and inorganic, are known to possess. The question arises, then, whether collodion is not *the* particular substance which photographers require; if so, we cannot be at too much pains in bringing it to perfection. I have heard it said that in the chemical laboratory we should be constantly at a stand-still without a fluid metal, and that, *therefore*, we have fluid metal, viz., mercury. So in photography, since we require a support for the sensitive iodide of silver, we have a substance which is calculated to answer as a support, and that substance I believe to be collodion. If the members agree with me, they will see that the appointment of a committee to inquire into the best mode of manufacturing collodion was a proper step for the Society to take.

But 2, the question of collodion is not only important, but difficult, and to a far greater extent than at first appears. This assertion has also been doubted, but nevertheless it admits of the most satisfactory proof. Those only who have manufactured collodion in large quantities, and have continued the manufacture for a long time, are fully aware of the strange anomalies which may arise. Just when they have begun to esteem their process perfect, a new difficulty starts up; and if this be disposed of, it is by-and-by succeeded by another. In the early days of collodion photography a little manual was published by Mr. Hennah, of Brighton, which rapidly passed through four editions, and was much prized by amateur practitioners of the art. In one of these editions—I think the third—we find the author apparently satisfied with the collodion process as it then stood, and pronouncing it nearly perfect; but in the succeeding editions he is compelled to put in a foot note qualifying his previous statement, and speaking of the art as, after all, but in a transition state. "The great impediment," he says, "is the absence of a collodion of uniform character. A remarkable and almost unaccountable difference is commonly observed in the degree of sensitiveness to light of different samples of collodion, independently of the iodising solution used; and it is believed that more remains to be done in the preparation of a good collodion than in any other branch of the process; for there is no doubt that most of the superiority of this over other methods is due to the little understood properties of the collodion itself. All who have the time are earnestly recommended to give their attention to the perfecting of collodion, as the most likely means of rendering this beautiful art not only more popular, but also of extending the range of its usefulness far beyond anything it has yet reached."

I have quoted the above remarks as according with my own views, and because their author is known in this Society as a good and candid observer. If it be objected that the book to which I refer was written five years ago, I would say that, as far as any information on collodion in the possession of the Society is concerned, it might have been written six months ago; for although individual makers of collodion have improved its quality, their improvements will not be found in the pages of the Society's Journal; and this consideration brings me to my third and last point, viz., the insufficiency of our published information when this committee was appointed.

In making the assertion that the Journal of the Society contained no complete information on the manufacture of photographic collodion, I do not mean for one moment to ignore the valuable papers of Mr. Hadow and others, to whom I have on many occasions acknowledged my obligations. I simply wish to observe that there was not in the Journal such a full and minute description of the commercial manufacture of collodion as would enable an intelligent person to prepare a gallon or two gallons of that substance per diem, and to compete, as regards quality, with makers who have acquired a reputation for producing a good article. I may, however, go further than this, and affirm that any individual desiring to become a manufacturer of collodion would, by many communications contained in our Journal, be entirely led astray. It is true that, appended to these communications, we have a distinct announcement that the Society is not responsible for the correctness of the views entertained by the authors; but are we to pass our whole existence in this negative state? and will the

public, who look to us to advance the interests of the art, be satisfied by our simply collecting all that comes to hand, and putting it into the Journal with the above reservation? What they require is something for which the Society *is* responsible; and therefore, since it is well known that we have amongst us members who understand what a really good collodion ought to be, it was most natural and proper that those members should come forward and make a report? If any one thinks differently, let him state in what manner he would advise the Society to expend its funds, and to attempt the fulfilment of the expectations which have been formed of it. It has been said that to legislate on a question in which different makers have to compete and exhibit their skill is wrong; and so no doubt it would be if these makers worked by one and the same formula: but if it can be shown that a new principle is involved in the formula to be reported on, the aspect of the matter changes. It would be premature to attempt at this time to prove that the collodion now before the Society differs fundamentally from other collodions, but at a later period of the discussion this evening I shall be happy to do so. Admitting such to be the case, we are certainly in the right path; and if our efforts to give a definite formula for collodion be crowned with success, the oft-repeated inquiry, What does the Photographic Society do for the advancement of the art? will be replied to for the present.

FURTHER REMARKS ON PERSPECTIVE & DISTORTION.

By Thomas Grubb, M.R.I.A.

The enclosed is a nearly verbatim transcript of a letter which I sent two months since to a friend who had his doubts on the question of which it treats. This letter, my friend informs me, he considers as perfectly conclusive and unanswerable. Had the reasoning applied only to a certain angle of view (as 60° more or less), I should not have sent it to you for publication; but it will be seen that the reasoning applies *irrespective of the angle included;* and my chief object in publishing the letter is, that it may act as an antidote to the error promulgated in the incongruous assertion that those principles of delineation which, being carried out for an angle of 60°, give no distortion, produce a hideous picture if carried out in an angular extent of 120°.

"To ——— Esq. "*Dublin*, 1st *March*, 1860.

"Dear Sir,

"It is evident from your letter that you adopt that view relative to perspective delineation on a plane surface which, judging from my experience, I should say not a few hold as correct. Such is, indeed, what may be termed the natural *surface view* of the matter; but it is also that which will neither bear the application of sound reasoning nor the test of direct experiment. Having been led, not a few years since, to examine the question independently and for my own satisfaction, I arrived at conclusions entirely opposite. In this I am quite aware of not having discovered any new fact, or anything which had not been recognised,—at least by the few, though, it may be, unrecognised by the many. I am not able to refer you to any standard work where you will find the matter adequately treated; but I shall here shortly rehearse that line of argument which not only convinced myself, but which has enabled me subsequently, and at sundry times, to convince others of that which can alone stand the test of inquiry.

"Your ideas may be shortly thus defined, viz., that a correct perspective front view of a long rectilinear building, occupying a considerable angular extent of view, is not correctly represented on a plane by rectilinear and parallel lines, but that, on the contrary, these should be converging as they approach the extremes of the picture; and your reason for such is that ordinarily advanced, viz., that inasmuch as the lateral portions of the object are farther from the eye, and therefore subtend a less proportional angle than the more central, so they should occupy a correspondingly less space on the surface of representation.

"I am not aware whether you propose to assume that these lines shall be *curved*, in addition to being converging. That lines, straight in nature (and appearing so to the eye), should be represented on a plane projection by curved ones (where they must of necessity appear as curved lines), appears inconsistent with *ordinary* sound reasoning.

"You will, of course, bear in mind the limiting conditions:—The object, or objects, to be represented lie in one or more vertical planes parallel to each other and to the surface of delineation (or *perspective plane*); and the question at issue is — How are vertical and horizontal lines in the object to be drawn in correct perspective on the surface of representation?

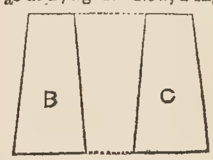
"I hold that such lines in the object are to be rendered (under the conditions) by similar lines in the drawing. The nature of the first proof I shall advance is that of the *argumentum ad absurdum*, and the case I here assume is that of a *tall* rather than of a long building.

"Suppose the object to be represented to be one of the faces or sides of a square vertical tower, having parallel and of course upright sides, the horizontal line of sight touching the bottom or base line of the tower, and the point of sight at that distance which will cause the top of the tower to subtend an angle of 30° to the horizontal line of sight, I assume an angle of 30°, not that there is any peculiarity connected with that angle, but partly because it is about the maximum which an artist expects to include in a plane projection, and partly because a lens can be so constructed as to include that angle on each side of the central (or vertical) ray, without palpable distortion.

"If, in the delineation of the proposed tower, we adopt those principles which would lead to the adoption of curved as well as converging lines in representing a long range of building, then the tower would be represented as in fig. 1; or, if you prefer to adopt straight converging lines, then the tower would be represented as at B, fig. 2. Now, I shall take

FIG. 1.

FIG. 2.



the liberty to add another tower C to fig. 2, similar to B, leaving a space between equal to the breadth of a tower.

"The force of the *argumentum ad absurdum* is now apparent. By giving the lines representing the sides of the towers the supposed necessary convergence due to the tops of the towers being farther from the point of sight than their bases, a diametrically opposite process has necessarily taken place with the space between, by virtue of which this space—*equally retreating at its top with the towers*—is made to *increase* instead of the reverse. If you attempt to project this space *converging*, as the towers, by making the latter lean, you get a step deeper into the dilemma; and should anyone imagine that a tower and a space as above are not to be drawn upon the same principles, I drop a third parallel tower between the other two, retaining the visibility of the bounding lines of contact, and presume that no one will have the hardihood to say that the resulting drawing represents a vertical triple building with vertical parting lines. It is indeed easy to observe, from mere inspection, that *none but vertical* lines will, under the conditions, represent such triple building.

"We have also a most ample mathematical proof of this, as follows:—

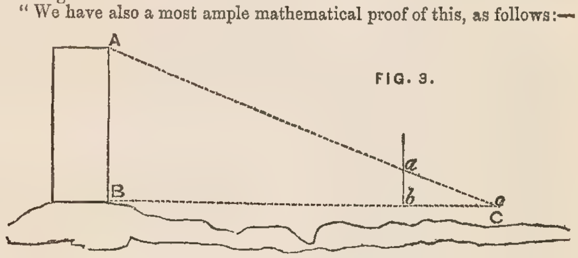


FIG. 3.

"Let A B, fig. 3, represent one such tower, C the point of sight, a b section of a transparent plane placed parallel to that side of the tower which the point of sight is opposed to, and suppose a ray proceeding from each of the four angles of the side A B of the tower to pass through the transparent plane a b, and meet at the point of sight C.

"A pair of these rays is represented by the lines A C, B C, and as the larger triangle, A C B, and the smaller, or a C b, are similar, it follows that $a\,C : b\,C :: A\,C : B\,C$; therefore, whatever reduction in *angular* measurement the top of the tower suffers at the point C, by its increased distance, as compared with the base, the same reduction in angular measurement will the corresponding part of the image bear (or suffer) from the same point C, when viewed from C on the transparent plane.

"We thus have a *full, perfect*, and *exact* equivalent in the varying distance of the plane from the point c, for the varying distance of the face or side of the tower, and therefore the vertical lines of, or on, the tower's front are to be represented on the transparent plane *by vertical lines, and by no other.*

"I shall now give you another mathematical proof, not only that these lines of representation on the plane must be vertical, but also that they must be *straight.*

"Take any straight line on the aforesaid tower's front—vertical, horizontal, or inclined, it matters not—and suppose rays to proceed from as many points of this line as you please, to the point C, without being refracted (or bent). Now the horn-book of mathematics teaches us that all these rays must lie in one and the selfsame plane, and it would be absurd to suppose that any section of that, or any other plane, can be a curve—it must be straight, and, therefore, wherever the transparent plane of representation a b cuts this plane (it may be close to the tower, or nearly touching the point C, or anywhere between) the section is a straight line, and where, as in the case before us, the surface from which such a series of rays coming from a straight line in the object emanates, and the surface of representation (or transparent plane a b) are parallel, the line in the object, and its representative line on the surface, a b, *are parallel*

lines in the same plane, and therefore must be *equally straight and perfectly parallel*.

"The foregoing proof you will, I doubt not, perceive to apply equally to horizontal (or flat) and vertical (or tall) subjects. This is easily demonstrated. Whatever is true in respect of the single tower of 30° above the line of sight, must be also true for a similar tower inverted and subtending 30° below the line of sight. The two towers thus united would form, in outline, an equivalent to one tower of 60°—one half being above, the other half below the line of sight.

"This object, revolved in its own plane, and on the line of sight as a centre, through 90°, would give an outline similar to a long range of low buildings, the line of sight being exactly central.

"To suppose that such change of position of the object can involve any alteration in the nature of its projection on the transparent plane, *a b*, is too absurd to require refutation; but, as you are a photographer, you can try the matter experimentally by rigging up a good broad plank on a centre, and observing its image in the camera in all positions. You surely will not expect to see the pheuomenon of a straight-lined figure in one position swell out into a barrelled or cigar fashion in another. In conclusion, I would remark, that although I have taken the illustrations as for 30° from the line of sight, the reasoning is equally good for 60°."

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 4.

There exists at the present time, amongst English photographers, a disposition to criticise the papers of MM. Davanne and Girard; and, although the writer of these "Comments" objects very strongly to enter upon any discussion which may become personal, he will not permit that feeling to prevent him from expressing his opinion. MM. Davanne and Girard have undertaken to examine the whole subject of positive printing, and to explain it in a scientific and rational manner. Their papers bear no appearance of being mere compilations, hastily thrown together, and asking for indulgence on the part of the critic; but are evidently intended for experimental researches, carefully matured previous to publication. It is, therefore, with a feeling of disappointment that, after a careful perusal of them, we find we have little that is new to enter in our note-book, and that many statements advanced by them are directly opposed to what we believe to be the truth.

The first cause of complaint which we entertain against MM. Davanne and Girard is that they do not sufficiently inform themselves on what has already been done; consequently we are continually startled at finding observations which we distinctly remember to have seen published years ago, either stated as new, or inserted in such a manner that they might fairly be taken to be new. The English journals are perhaps less read in France than the French journals are in England, and it is well to exercise charity in these matters; still the omission has the appearance of carelessness, and, to say the least, it does not prepossess in favour of the writers. Hence, if at the present time a voice should suddenly rise, and accuse us in plain language of being prejudiced against MM. Davanne and Girard, it is doubtful whether we should be able to offer a denial: we could only say that no prejudice of ours should be allowed to interfere with a cordial recognition of any new facts which they might discover.

But a more serious drawback to the usefulness of the researches now under criticism is, that they are too dogmatic and authoritative on matters which do not admit of being settled in a summary manner. It is an easy thing to step in with chemical formulæ and to decide at once a question which has agitated the minds of photographers for years, but will the intelligent reader be convinced by such a course of proceeding? We think not. For instance, in the paper on the fixing of proofs, we find it said to the effect that the sub-chloride of silver is decomposed by the fixing agent, and leaves a residue of spongy metallic silver, which forms the image.* Now we wish to protest against such an hypothesis, and to put on record our most confident prediction that, in ten years from the present time, no well-informed chemist will entertain it. In order to be sure that the views which we now express are, in substance, the same as those brought forward in July, 1856, in a paper *On the Composition of the Image*, we have referred to that paper, and find it therein stated that the author believes the only essential elements in photographic printing to be oxide of silver and organic matter; that the oxide of silver is reduced more or less completely, and that the product remains in union with the organic matter. Nothing definite was said as to whether this product of reduction consisted of metallic silver, or of a low oxide, but the probability was thought to be in favour of the latter, inasmuch as sub-oxides are known to unite with organic substances, whereas metals have not been shown to do so. Observe, we make no allusion whatever to chloride of silver, because we believe that photographic prints are obtainable without chloride of silver, although this body is useful in giving *rapidity* to the insolation. We have on many occasions expressed our belief in the existence of an inferior chloride of silver, containing less chlorine than the white chloride; but, that a decomposition of this body by the fixing agent forms the photographic print, we are not for a moment prepared to admit. The proper view to take of the photographic print, in our opinion, is that of a sub-compound of silver attached to the animal or vegetable supporting basis by a mordant action; and the nearest resemblance we can think of at this moment is the red stain on linen, known as "an iron-mould," and caused either by an oxide or a basic salt of iron attached in a peculiar way to the fibre.

As regards the fixing of a paper print, we also prefer to dismiss from our minds all preconceived ideas as to the solubility of chloride of silver in hyposulphite of soda, and to consider that we have in this process to deal with animal matters, albumen or gelatine, coagulated by nitrate of silver; or sometimes with vegetable substances in union with nitrate of silver. Let no one suppose that the whole of the nitrate of silver will be extracted by a previous washing of the print with water, for it has lately been shown that not even salt and water will immediately decompose these organic combinations with nitrate of silver. Moreover, a fixing agent, if intended to dissolve them thoroughly, must be much stronger than theory would indicate for chloride of silver; and time must be allowed for its proper action, otherwise the print, although fixed on the surface, will exhibit yellow patches in its substance. Any one who is doubtful of this may precipitate a little albuminate of silver, and, after darkening it slightly, try to extract the excess of oxide of silver from it by means of hyposulphite. He will find that he has a far more refractory substance to deal with than simple chloride of silver.

P.S. Since the above article was written, a paper, read before the North London Association by Mr. Dawson, has been placed in our hands; and although at the present time we have not had an opportunity of repeating the experiments therein described, we are nevertheless quite prepared to believe them; for we have observed the behaviour of hyposulphite of soda with salts of silver, and have noticed how strong its affinities in that direction are.

* We are aware that MM. Davanne and Girard have of late spoken of argento-organic compounds, &c., but no mention of organic matter was made in their first communication, in the *Bulletin* of June, 1855. At that time they considered the image to consist of pure metallic silver, and it does not appear that they have ever made any acknowledgment of error in having originally entertained such an opinion.

ON THE INFLUENCE OF LIGHT & HEAT IN CHANGING THE PHYSICAL PROPERTIES OF BODIES.

By J. Kibble.

[Read at a meeting of the City of Glasgow and West of Scotland Photographic Society, Thursday, May 3rd, 1860.]

It might almost be considered, from the voluminous papers written upon the influence of light in darkening the various salts of silver when in contact with organic matter, that the subject by this time must be nearly exhausted; but, as a proof against any such supposition, we have only to remember that an ordinary lifetime is insufficient to mix a very few grains of any two substances in their various proportions; so that what is yet to do in submitting the 62 elements already recognised by chemists, which comprise the earth we inhabit, in all their different proportions, to the action of each other, and that under different degrees of temperature, of pressure, under the influence of electricity, and of the two former combined in vacuo, and numberless other arrangements, will require a period of time as difficult for the mind to conceive as the comprehension of eternity itself. This remark I make chiefly to remove the idea possessed by many that their time is too limited or their means too inadequate to enable them to enter into the field of investigation. Also, many consider their chemical knowledge too feeble to enable them to add any information to that already amassed. But I trust a very simple question will dissipate any such false impression—and that is, whence our knowledge of the darkening influence of light on the chloride of silver? Was it originally the result of investigation? Certainly not. It was the effect of a cause made palpable to the eyesight when wholly undreamed of, and which could no more be hindered from imprinting the fact on the retinæ than the sounds which I now utter from being the means of communication between us. The whole merit, after having seen the effect, consisted in analysing the mode of action of the cause, which merit without doubt belongs to the illustrious Scheele. Yet, notwithstanding the laborious researches

of subsequent philosophers, on account of the mysterious nature of the subject, there still remains much to be learned. All must admit who have practised photography that wonderful changes have resulted from apparently trifling causes, which, although not satisfactorily explainable, are nevertheless of great value. One great source of change is heat. The annoyance given by a very few degrees above the average summer temperature must be too familiar to all of you to require any enumeration at the present time; but, perhaps, although not directly connected with photography, I may be allowed to bring under your notice a few instances of the important part caloric plays in chemistry, and which in all probability exercises similar actions in many of our own processes, as yet unsuspected, which will at the same time show the necessity of precision in noting all experiments carefully, so that when a result of any consequence is attained, the same can be accurately repeated. The first substance I shall mention is one familiar to all of you—that fluid by which the yolk of egg is surrounded, albumen. In its ordinary state it is semi-transparent, nearly colourless, soluble in water in all proportions. Increase its temperature to 165 degs., and mark the change. The mobility of its particles, until acted on by some other force, is destroyed, its transparency gone, it no longer dissolves in water; it now presents a beautiful white porcelain aspect, which will dissolve with the aid of heat in hydrochloric acid, producing an exquisite purple solution, although *both* substances *previous* to solution were colourless. Gelatine, on the other hand, which is almost insoluble in cold water, by the addition of a very few degrees of caloric, loses the cohesion of its particles and enters into solution. Again, the carbonate of lime, when crystallising from cold solutions, arranges its particles in the form of Iceland spar; when from hot solutions, in the form of aragonite. Both these minerals, although composed of exactly the same amount of carbonic acid and lime, are physically quite different. Still more striking, and also from the authority of Liebig, cyanuric acid, which is crystalline, soluble in water, capable of forming salts with metallic oxides, when heated in a hermetically-sealed vessel, and a high degree of temperature applied, becomes a volatile and highly corrosive fluid, which cannot come into contact with water without *instant* decomposition, and which, if kept at the common temperature for some time, is converted into a white substance resembling porcelain, absolutely insoluble in water, *no* constituent being separated, nor any body taken up from without. Thus we see the same constituents, in *exactly* the same proportions, when made subject to a different molecular arrangement by heat, form compounds with totally different properties. Phosphorus also undergoes similar transformations. In its ordinary state it is almost colourless, dissolves in bisulphuret of carbon in all proportions. In small quantities it is exceedingly poisonous; when exposed to moist atmospheric influences, it *oxidises*, forming a deliquescent acid. If heated in a vessel from which air is excluded, and kept at a temperature ranging from 464 to 482 degrees, its former properties are destroyed, it becomes of a brownish red. A quantity that formerly would produce certain death is now inert on the animal system; it does not change in moist air, and is now insoluble in bisulphuret of carbon. A low red heat once more restores its original properties. Another very singular instance may be adduced, in the conversion of alcohol, by the influence of heat and sulphuric acid, into that most invaluable of all bodies to the photographer, ether. If the alcohol be above 90 per cent. the amount of sulphuric ether obtained is proportional to the amount of the former used. The sulphuric acid on the other hand, until weakened by the water left by the alcohol, retains its powers of conversion unimpaired. Witness the action of heat on metallic zinc. Up to 210 degrees it is brittle, from 210 to 300 degrees, the particles admit of considerable freedom of motion on one another, and can be rolled into sheets without at all impairing the cohesion. Raise the temperature a very little, its ductility is destroyed—the metal now separates with the blow of a hammer. Again, increase the heat, fluidity begins; the particles now move over each other with the greatest freedom. At a still higher heat, repulsion ensues; the particles now repel each other. If in a close vessel the metal distils, becoming solid once more on the loss of caloric. May there not exist analogous actions, although more imperceptible, and of a more delicate nature, in the arrangement of the particles in the act of reduction by actinism, or in the toning by heated solutions? Would such a result be more wonderful or inexplicable than the following:—Take two parts of sulphate of soda, one of water, dissolve by a high heat; almost fill a glass vessel with the solution, set it aside to cool where it will be free from vibration. After having covered the mouth of the vessel with a card-board to keep out dust, and when cool, say three or four hours afterwards, take a glass rod, immerse it in the solution; crystallisation immediately takes place, radiating from the rod until the whole becomes a mass of crystals. Repeat the experiment, but this time heat one end of the glass rod in the flame of a spirit lamp. Then, after it has thoroughly cooled, immerse it as before. Mark the change; no crystallisation takes place, even although freely moved about in the solution. In the first instance, the motion communicated by contact with a piece of the same material as that holding the solution, but which has *not* been heated and cooled along with it, is propagated from particle to particle, until the fluid becomes a solid. An increase of caloric seems to have destroyed some property possessed by the end of the rod that was heated; on applying the opposite end, which has *not* been heated, crystallisation again takes place. The glass rod, if kept in a closed vessel, does not regain its original properties for about 14 days; in the open air 3 or 4 days is sufficient. Here once more an immaterial agent acts a part that cannot satisfactorily be explained: at the same time, not more wonderful than bottling light, and photographing with it in the dark. If proof of the above could not be established, the assertion would be considered about as idle as the idea of the alchemists of old, that the inferior metals could be transmuted into the nobler. Nothing *material* added to or abstracted from; nevertheless, a body loses all its former properties and becomes possessed of new ones. Seeing the very remarkable part caloric plays in ordinary chemistry, is it not more than probable that its influence may be exercised to an equal extent in photographic chemistry, such as in the toning bath? That heated solutions darken the image more rapidly will, I think, be admitted; but whether it fixes or puts beyond the farther influence of light to a greater extent than solutions at the ordinary atmospheric temperature, time alone can determine. May there not exist particular points in the process, at which the *converse* of fixture takes place—at which the particles may arrange themselves in a manner ready to be acted on by a very slight disturbing force, such as the actinic rays? Have we not in the photogenic science a very striking example of opposite effects from a continuation of the action of the same cause? It is well known to all of you that a certain amount of exposure of one of the sensitive surfaces—viz., iodide of silver—to the actinic rays produces a certain effect which is again destroyed by a prolonged exposure. Indeed I attribute the great success in producing what are termed instantaneous results to accident in shutting off the exposure in the camera at *that particular* time when the intense lights, such as from clouds and water at the angle of reflection have, as it were, to a certain extent neutralised the actinic force after it had reached its maximum—the action of the high lights decreasing, whilst the feebler lights increase their force. For instance, let the subject be a highly illumined landscape, with hazy clouds overhead; allow the proper exposure for the cloud to be *one* second, for the landscape five seconds; but suppose that five seconds would completely destroy the action established by the cloud-rays, by shutting out the image say at three seconds, the action originally gained by one second will be considerably weakened. At the same time the rays from the landscape will have been increasing in force, so that you can easily imagine a point when the two states of the actinic force will be nearly balanced, and an exquisite result attained. I had in my possession at one time a positive upon paper which during a few years underwent a succession of changes until latterly the image became quite faint, and has all the metallic lustre of sensitised positive paper that has been exposed for days to bright sunshine. There was undoubtedly a re-arrangement of the particles of silver from the action of light itself, or, perhaps, in conjunction with some chemical unwashed from the paper: if the latter, it points out the necessity of thorough washing. About four years ago I varnished several paper positives with albumen in the state you get it from the egg. After being thoroughly dried I enclosed them in their frames, covering the back of them carefully to exclude dust. The whole of the delicate tints have now vanished, whilst others from the same negative—which were sensitised, printed, and fixed in the same solutions, but without the after coating of albumen—seem in no degree changed, although hanging side by side with the others. This must be due to the small quantity of phosphorus and of sulphur existing in the albumen, forming combinations of the metal, both of which are subject to re-arrangement of particles under the actinic rays. This may also account for the very small quantity of hyposulphite of soda that will render photographs destructible, if not properly dissolved out of the paper. I may here mention the apparatus I used when working with small photographs, and which thoroughly separated all the loose chemicals from the paper in a few minutes. This was effected by first steeping any number of them in a large quantity of clean water, then passing them—several at a time—

between a pair of glass rollers mounted for the purpose, the upper journals of which are acted on by stiff springs so that a considerable amount of pressure was given out, at the same time neutralising any bad effects from the inequality of the rollers. This pressure could be increased at will by turning a pinching screw over the springs; the imbibed fluid being well expressed in each passage was immediately replaced by the clean fluid, into which they fell, and so on until satisfactorily washed. I found a very few minutes of this mode superior to hours of steeping, dripping, or pressure with a sponge. Brass rollers, electroplated with silver, with a thin wash of gold on top of it, would be equally efficacious, and much more easily made correct—of course, in a system of this kind care must be taken not to use too much pressure, or elongation of the paper will take place. When on the subject of the fading of photographs, I will communicate for your investigation a theory that arose in my mind some time ago, but the accuracy of which circumstances prevented me from satisfying myself by experiment to the extent that I at one time intended. It is as follows:—The surface of sensitised paper that has been allowed to darken under the influence of the actinic rays, is considered, according to the atomic theory, to be composed of innumerable atoms of the darkened body, placed at inappreciable distances from each other—that is, every particle is surrounded by space, not filled with the body itself, and which allows room for freedom of motion under a disturbing cause; at same time, so nearly approximated that the highest optical power fails in discovering separation. Now, when chloride of silver is subjected to the ray power, a visible change takes place, doubtless effected by motion of the particles in the act of a new arrangement; also, accompanied by reduction of the chloride to metallic silver. We have only to imagine, during this change, one or more revolutions of every atom composing the external film of the chloride, which after the change may be considered as so many infinitesimal spheres, composed externally of reduced silver, internally filled with almost unchanged chloride, which has been protected from the further influence of light by the outer film. Now, in the fixing of hyposulphite of soda, you have only to conceive a partial thinning of the sphericles, which will bring them into a condition unable to resist the penetration of light under a continued exposure, which, by getting access to the inner chloride, will, by reduction, cause chloride to evolve, which, in turn, will act upon the metallic surface by which it is surrounded, and although producing the very substance (chloride of silver) that formed the image originally, will now exist under very different circumstances, and only darken to that faint violet tint so similar to faded photographs. By way of illustration, a similar action, but purely chemical, may be given:—Precipitate chloride of silver from an extremely dilute solution of the nitrate. It will fall in a very finely divided state. After washing the precipitate, pour over it a weak solution of aqua potassæ; boil it for a short time; stop the process immediately it is pretty dark; again wash; pour over it nitric acid; the darkness will disappear, the chloride appearing as before. This arises from the nitric acid dissolving the external coating of oxide of silver from the particles of the chloride, the boiling with potassæ not having been continued long enough to effect decomposition throughout the mass, and may represent a certain exposure of the chloride under actinism. Indeed the same experiment can be made with the chloride which has been exposed for a considerable time under light. I am of opinion there is a considerable field in this direction for future investigation, and of a highly-interesting nature. But knowing there is other business on hand this evening, I will trespass no further on your kind patience.

ON PHOTOGRAPHY IN ITS RELATIONS TO THE FINE ARTS.

By M. Claudet.

[Abstract of a Paper read at a Meeting of the Photographic Society of Scotland, May 8th, 1860.]

After expressing the pleasure he felt in having been admitted a member of the Society, M. Claudet said, that in Scotland the art of photography had already attained the highest state of perfection; in proof of which he referred to the annual exhibitions of the Society, in which from time to time were gathered together pictures displaying a high degree of merit. The subjects embraced in these pictures were of a very varied character, comprising mountain scenery, general views, old ruins, &c. The Scotch possess in their country rich and abundant subjects for their pictures, which could not fail to develop in them a taste for the photographic art. Every country imparted to photography a peculiar merit of its own, and for this reason Scotland was called upon to occupy a conspicuous position among the various schools of photography.

He would at that time treat of photography in its relation to the fine arts. When the present state of photography was considered, and the vast strides it had made during the last four years, it would seem that a more perfect process could scarcely be wished. The highly sensitive plates on which even such subjects as the waves of the sea could be fixed, were results which only a few years ago would appear difficult to have attained; and supposing photography to make no further progress, it was in its present state a most valuable auxiliary to the artist, as an agent in the hands of whom its application required taste and discrimination.

In taking a picture the first care was to select a fine subject, and that attained, the next point was the selection of a proper point of view from which to take it, and, lastly, the hour of the day at which the lights and shades would be most effectively rendered; for by taking the same view under different conditions of light very important changes were apparent. All those points having been attended to, the photographer should then never leave the place until he had obtained as perfect a picture as possible. He must seize his subject at precisely the right moment, otherwise, although he might obtain a perfect photograph, it would not be an artistic picture.

Photography was an art in which only genius and talent could rise to a high position. In the immense number of photographs exhibited during the past five years how small was the number meriting the designation of really fine photographic pictures! There was neither pleasure nor merit in doing that which did not cost trouble or talent.

Photography would increase the taste for the productions of art; and, reciprocally, art would increase a taste for photography. Photography was the imitator of nature—the drawing was perfect, and the perspective correct. It was the image of the objects depicted in the retina which, if transitory, still was susceptible of leaving on gifted minds an impression capable of being continually recalled by the powers of memory. Photography was to the fine arts what logarithms were to mathematics; by its means work was more easy, and was more rapidly accomplished. It was to the artist a vocabulary which guides him as the handbook of nature.

Why had photography been invented? The story was a simple one. Men of science had long ago tried to ascertain the action of light upon certain chemical agents. This was merely as a philosophical inquiry, but such inquiries being sufficient to prove that light caused changes in such substances, a desire was awakened in artists that the images of nature represented in the *camera obscura* should be fixed. Wedgwood was one of the earliest to enter this field of research; but, although he obtained photographic pictures, he was unable to fix them from the further action of light, hence they had to be kept in the dark, and could only be viewed by a feeble light. N. Niepce having found that certain bituminous substances were rendered insoluble by light, founded on it a process then well known. This process, however, was too slow to admit of its general application, and at that stage Daguerre and Talbot came into the field with their experiments. By a curious coincidence, the two discoveries of these gentlemen were made simultaneously in France and England; and, more singular still, they each presented a novel and peculiar feature, for both of them had found substances sensitive to light, but not sufficiently so to bring out a picture by an ordinary exposure to its action. They argued in this way:—If the light of the camera has not been intense enough to produce a complete impression, the sensitive surface must yet have received an action which must be capable of being completed by other chemical re-agents.—The difficulties in their way were innumerable, but both eventually succeeded in developing a latent picture: one by the action of the fumes of mercury, and the other by a solution of gallic acid. The Daguerreotype process had since that time been very much improved. He himself (M. Claudet) discovered the peculiar accelerating effect of chloride of iodine and bromine, which he had published on June 10th, 1841; and subsequently others had laboured to improve photography, chief among whom were Niepce de St. Victor and Scott Archer—the latter a most unpretending and deserving man, who died before he got the reward of his merit; but a collection for whose children was now being made, which he hoped would be liberally contributed to by all who had derived pleasure or benefit from the practice of the collodion process.

From the moment of Archer's improvements being introduced Talbot's process might be called instantaneous; and he considered that Daguerre and Talbot were justly entitled to be considered as the fathers of photography. Daguerre was a professional painter of some reputation, and was renowned for his invention of the diorama. He was in the habit of making his sketches by the aid

of a camera, and had often thought how much his labour would be lessened were it only possible to fix these pictures at once. Fox Talbot, an independent gentleman, was in the habit of taking sketches during his travels, and was induced to try to fix the camera image by means of some chemical application. Both were amply successful in their endeavours. M. Claudet thought it was only an act of justice as well as of courtesy that the name Talbotype should be continued to be applied to the pictures invented by Mr. Talbot. Since photography had been invented because fine art was in want of it, was it not ridiculous to suppose that art could be injured by it? In miniature painting it had been of the most signal advantage, as it very materially shortened the sittings. A photographer of taste, feeling, and judgment, although not a painter, might yet know how to place a model so as to give the greatest possible grace to a picture, and a painter could not fail to find among the productions of such many excellent models for study, as photographers arrange and pose many subjects daily, while the painter only arranges what he can paint. M. Claudet spoke at some length of the commercial importance of photography, showing how it had given an impetus to various branches of trade and science, more especially to glass-making for optical purposes—the construction of glass-houses—chemistry—the construction of lenses, which had been brought to a high state of perfection; and he concluded by some remarks on the application of photography to the stereoscope.

THE FOTHERGILL PROCESS.

By Alfred Keene.

[Read at the Meeting of the Birmingham Photographic Society, April 24th, 1860.]

(Concluded from page 129.)

The principle of the Fothergill process is the formation of a sensitive compound of albumen and nitrate of silver, not on the surface, but in the porous cells of the collodion, by diluting the silver solution on the surface of a sensitised collodion plate, to a point that does not coagulate the albumen afterwards applied, and subsequenly washing away all excess of the latter; and it has been received as an established fact (first, I believe, promulgated by myself, and confirmed by general experience), that sensitiveness decreases in proportion to the extent of the dilution until it reaches a point equivalent to non-sensitiveness—hence the necessity for the bath solution and albumen being brought together in certain relative proportions. This, however, has lately been denied by a correspondent, "M. N. P. S." in one of the journals, who maintained that little loss of sensitiveness was produced by even thoroughly washing under a tap previous to the application of albumen, and advocated the preparation of plates in this manner, asserting that he had practised it with much success. A statement so diametrically opposed to all former experience, and likely, as I fully believed, to cause much disappointment, necessarily led to a discussion. In order more completely to satisfy myself of the correctness of the opinion that there was the decrease in sensitiveness generally believed to be produced, I prepared something like thirty or forty plates, with the use of various quantities of water, and exposed and developed them under circumstances that would ensure a correct comparative effect. The following is a summary of the result, which fully established the opinion I had arrived at:—

The use of one drachm of water to every five and a-half superficial square inches of sensitised surface taken as the standard, 1; the use of one half more water, being one and a-half drachms, reduces sensitiveness to half; the use of six drachms reduces it to $\frac{1}{18}$; and the entire removal of all free nitrate, by washing in *pure* distilled water (to prevent the formation of a sensitive chloride of silver) subsequent immersion for an hour in a three-grain solution of iodide of potassium, and again for half-an-hour in a second three-grain solution, and well washing, required, in November, an exposure of four hours to direct light under a negative, equivalent practically to *non*-sensitiveness.

Finding, however, "M. N. P. S." still to adhere to his former statement, notwithstanding the publication of these facts, and having no reason to doubt his veracity, it became necessary to look for a solution of the enigma to some peculiarity in the mode of preparation that admitted of the thorough washing, but had not received credit for the important influence it exercised; and after some consideration, it occurred to me probable that if the plate were coated with albumen previous to the collodion (a plan, as you are aware, much adopted, both in the wet and dry processes, to make the film adhere more firmly, and save the risk of damage from imperfectly cleaned plates), there might be, by endosmosic action, *the same sensitive compound formed as in the Fothergill process*, which would, of course, admit of any amount of water being used previous to the second application of the albumen, and at once account for our varied experience.

A few experiments settled the matter. They showed that a plate, little less sensitive than an ordinary Fothergill one, could be prepared by first coating with albumen, and, when dry, with collodion, sensitising and well washing, *without* any second application of albumen. This, which at first sight promised to give a most simple dry process, has not so far proved practicable, it being necessary to use a second application of albumen, or something similar, to sufficiently get rid of free nitrate, to avoid stains. The following is the plan of preparing plates I have as yet found answer best:—Coat the plate with thin albumen, composed of—

White of egg.................................. 1 ounce.
Distilled water .... 24 ounces.
Strong liquor of ammonia......... 20 or 30 minims.

Agitate and filter, and quickly dry, by holding it near a brisk fire; then coat with collodion; sensitise in a thirty-five-grain bath; wash under a tap or in a dish with two changes of water; apply either the dilute albumen previously mentioned or the ordinary stronger one (the latter I prefer); wash as before, and drain and dry, as recommended for Fothergill prepared plates. At first, I used the strong albumen for the first coating and the weak one for the second; but with this there was a tendency to blister, which has not shown itself, so far, when the thin albumen is used first. I am disposed to consider that the sensitiveness of plates prepared in this manner is quite equal to the Fothergill process ones. Less care and skill is certainly required in their preparation, and from the sensitive compound being under the film, and free from atmospheric influence, the keeping properties may be expected to prove almost unlimited; and if the results should prove equal, and blisters absent, it is a modification likely to be much practised.

In conclusion, I have the pleasure to lay before you a few prints, kindly lent me by Mr. Ebbage, of Leamington, all from negatives prepared according to No. 1 plan, viz., the use of one drachm of water to every five and a-half superficial inches of sensitive surface; also a negative, illustrative of the keeping properties of this plan, the plate having been prepared a month prior to exposure, and kept in a temperature frequently reaching as high as from sixty-five to seventy degrees. You will perceive it shows no signs of decomposition, and had not lost anything in sensitiveness. Mr. Ebbage informs me that his average exposure with a Ross's lens for 10 by 8 inch plates is not more than three minutes.

ON THE ENLARGING OF POSITIVE PROOFS.

By M. Bertsch.

When a section of the cone of solar rays, transmitted through a non-achromatic converging lens, is projected on a screen, we remark, if the experiment is made within the principal focus, that the field is composed of a brilliant central disc, representing about a fourth of the illuminated surface, then of concentric circles of varying intensities. This appearance is due to dispersion. The central disc is the image of the pencils which traverse the axis and neighbouring parts without being sensibly refracted; while the zone that surrounds it, produced, on the contrary, by the most inflected pencils, is only a mixture of violet light with white light.

Next come, in the well-known order, zones of blue, green, yellow, orange, and red, so that the field of light is always fringed with red. If the experiment is made beyond the principal focus of the collective lens, the phenomenon will be reversed: the central parts will become red, and the borders violet.

Masked by the great quantity of white light resulting from the mixture of a large number of rays of different colours, this arrangement will really be apparent to the eye only upon the borders of the field, but, as we shall see, it exists nevertheless in every part of it.

Let us take a crown illuminating lens, of which the focal distance of the red ray is thirty centimètres, we shall see that, for the violet rays, this distance will be only twenty-seven centimètres. The mean rays are found comprised, at unequal distances, between these two points.

For an amplifying apparatus, take a simple achromatic converging lens, and project upon a screen the enlarged image of the sun which is found in the focus of the collective lens. We have seen that on account of the dispersion this focus is not single, but comprised between two caustics of a certain length. If, therefore, we focus the most distant, which is consequently the most refracted, we shall have a red image of the sun upon the screen. Suppose this image is focussed at thirty centimètres, we shall see that, to obtain the same clearness for the violet image, we must bring the

screen five centimètres nearer to the amplifying lens — a position where only the violet ceases to be divergent. Now substitute in place of the screen a sensitised plate, also placed at thirty centimètres: the image that it will give will be a sort of target, composed of concentric rings of very different intensities. The central disc produced by the red, although it appears very luminous, will have but very feebly impressed the film, while the exterior zone, composed of the divergent violet light, will have given an opposite result; the intermediate zones will also have given their images in proportion to their chemical action. It is unnecessary to add, that if we have taken for the centre of the image the shortest, that is, the most refracted rays, the effect will be inverse, and we shall have a centre much more impressed than the borders. A negative, or any other object, composed of translucid and transparent parts, submitted to amplification in such a light, will give a proof unequally illuminated from the centre to the circumference,—the field being composed of concentric rings of different intensities.

We shall see that the inequality of the lighting is not the only inconvenience the convergent light presents. Two other phenomena also concur in this case to disturb the clearness of the images. When we wish to project a slightly-enlarged image of a small plane object by means of an objective in which the spherical aberration is well corrected, one thing at first surprises us—we cannot focus all the parts at once. The focus for the centre is much shorter than that for the circumference. This difficulty is explained by the effect of chromatic aberration, not by spherical. The field of light, as we have seen, is composed of zones of colours of unequal refrangibility: the object sends no specular light, and but little diffused light, because it is almost transparent; so that lighted in the centre by light transmitted red, starting from this point it is successively lighted by yellow, green, blue, and violet, the undulations of which have neither the same length, amplitude, or duration. The amplifying apparatus also shows us in this case that the field of light is only white light mixed with the tints resulting from dispersion.

With convergent or divergent light there are then no means of lighting or focussing equally from the centre to the circumference all the parts of an object of any size, and this is one reason why the solar microscope, as at present constructed, has remained an instrument of curiosity, and that without the modifications I have made in it it would be useless for photographic purposes.

It remains to demonstrate that a third cause of disturbance, and one of the most important, also results from the convergent lighting. To avoid complicating the question, and to confine ourselves within the practical limits of superficial enlarging of five or six times, we shall admit that the convergent rays which emerge from the collecting lens are white light. In examining these rays after interposing a parallel glass in their path, we see that the caustics which limit their focus are much lengthened, while at the same time the field of light changes its aspect. We now encounter the phenomenon of interference. From the centre, where the refraction is *nil*, unto the circumference, where it is at its maximum, the pencils fall upon the glass with very different incidences, so that upon their emergence the relation between their sinus of refraction and their incidence is changed: they then proceed in a less parallel direction together, and interfere with each other before arriving at the focus. The final result is a new disturbance in the equality of the lighting, which is also complicated by the fact that the glass that sustains the film has never parallel faces.

It is only necessary to substitute a microscopic object for the transparent glass to recognise the influence of this new cause of perturbation. Fringes of diffraction form upon all the contours; the details are vague, the lines faint, blurred, and multiplied.

It is said that a convergent lighting is the only condition which admits of the employment of all the transmitted light; and the reason assigned is, that the focus of the lighting cone is found upon the optical axis of the amplifying apparatus, or rather upon the first lens of the doublet of which it is composed.

To become satisfied, on the contrary, that this luminous point is of more harm than good, we have only to fasten a wafer in the centre of the first lens, where the collective lens has its focus: the image is immediately improved. Finally, let us follow the path of the light in the amplifying apparatus as we have done in the lighting. What is this luminous point? It is the image of the sun, which I suppose to be single, although the convergent lens, not being achromatic, gives a good many. It does not contain the miniature image of the negative, as might be supposed, for the light of this point to be efficacious. On the contrary, it results from the union in the focus of all the pencils which have traversed the transparent parts of the glass.

To examine what will be the effect let us imagine a case. This image will be nearer or farther from the principal focus of the doublet of which the objective is composed, or rather it will coincide with this focus. In this case it will give upon the screen a bundle of parallel rays or a smaller disc than the field of light necessary to illuminate the negative. If farther, as the principal focus is enlarged only by one of the lenses of long focus composing the objective, it will form a round image of the sun in the midst of the amplified negative; if nearer, a bundle of divergent rays which will cover the projected image with a luminous veil. Far from strengthening the effective light, it will serve only to veil the proof and make it less vigorous. From what we know of interferences we may say that, penetrating the apparatus under a different incidence from that of the light transmitted by the negative, it is the cause of a supplementary diffraction.

The study I have for a long time made upon the influence of the lighting upon the clearness of the results would, nevertheless, not have led me to make these remarks, if I were not prepared to propose a simple means of diminishing the inconveniences of the convergent light, otherwise scarcely evident in practice in the slight enlargements employed. I should not have pointed out these sources of troubles if it were necessary to have recourse to expensive instruments to remove them. Understanding that, between an apparatus intended for superficial enlargements of ten or fifteen times and one for lighting objects enlarged a million times, there must be a very considerable difference, I should have said nothing about them if I had not thought they could have been rectified without expense.

I have contrived an instrument which, like the solar microscope, is composed of a reflector moving in two planes, intersecting each other in such a manner as to permit at any moment the bringing the sun into the optical axis; of a plano-convex lens; and of a concave lens of variable diameter and focus for three positions. This lens, of the same dispersive power as the first, is calculated, in its diameter and vertical focus, for the place it must occupy in the convergent cone, the rays of which it is intended to render parallel at their emergence.

To lose none of the light transmitted, and to concentrate upon the negative all the parallel light sent by the reflector upon the whole surface of the collective lens, I have made three negative lenses for changing; the operator is therefore enabled to limit the diameter of the bundle of rays parallel to that of the negative to be enlarged. By these means we see that, in the limits of practice, no part of the incident light is lost. The intensity of the bundle of rays is in the inverse ratio of the square of the diameters of the negative lenses employed; thus there is the advantage of making use of that upon the surface of which the negative may be placed.

In the conditions of parallelism in which I place myself, both at the entrance and upon the departure, the rays in their passage through the plate suffer no refraction, and the interference of this latter produces no modification. Experience has long demonstrated to me that, with this light, most of the disturbing phenomena disappear, as the focussing is more exact, and the aberration less evident; and lastly, the fringes of diffraction only begin to appear at a distance ten times greater than with convergent light, that is to say, with enlargements a hundred times greater. Still, although presenting advantages over convergent lighting, which appear to me indisputable for the end proposed, in very delicate experiments, and when we endeavour to obtain an image of which the superficial dimensions are magnified five to six hundred thousand times, they give rise to effects which do not admit of their being employed.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Tuesday evening, the 1st instant, in the Library of King's College, — Henry White, Esq., in the chair.

The Chairman, on taking his seat, stated that it had been fully anticipated that their President, the Lord Chief Baron Sir Frederick Pollock, would have presided on the occasion of the Society's first meeting at their new rooms in King's College; but, as his Lordship had not arrived by half-past eight, he had been requested to take the chair.

The minutes of the last meeting having been read and confirmed, Captain R. L. Playfair and George Lowie, Esq., were duly elected members.

Mr. Shadbolt exhibited two views of Trinity College, Dublin, taken by Mr. Grubb, with an aplanatic lens of nine inches focus, which included an angle of 60°.

Mr. Hardwich then read a paper *On the Value of Collodion as a Photographic Agent.* [See page 142.]

After the reading of the paper had been concluded,

The Chairman suggested that the discussion on the Collodion Report should then be proceeded with; and as Mr. Malone had formerly expressed a wish that that subject should be discussed that evening, perhaps he would favour the meeting with his views.

Mr. Malone observed that, with such an appeal, he could not refuse to rise; but he begged to state that although he had been anxious that the report should be fully discussed, yet he was not anxious to commence the discussion. If his memory were correct, it was Mr. Mayall who at the last meeting proposed that the discussion should be re-opened, and he (Mr. Malone) certainly expected to see Mr. Mayall present that evening. That gentleman's absence had placed him (Mr. Malone) rather in a difficult position, as he was there to defend the report, and nothing had as yet been said on either side. He should therefore place himself entirely in the hands of the meeting, and thought he could not do better than sit down, expressing his willingness to rise at a later period in case anything should be said which might call for a reply from him.

Mr. Heath expressed his unwillingness to commence the discussion, and rose to suggest that some mistake had arisen as to the day, for Mr. Mayall distinctly moved the adjournment of the discussion, and assuredly he was not the man to exhibit any disrespect towards the Society. There was a conviction in the minds of many that there must be a mistake as to the day, or that some other cause had prevented his and, perhaps, the Lord Chief Baron's attendance. Under the circumstances he begged to put the question, whether the meeting could not extend its indulgence to Mr. Mayall, and again postpone the discussion?

The Chairman considered that as it was the last meeting but one of the season, and as Mr. Hardwich was present to meet all comers, and likewise that there were many gentlemen present for the purpose of hearing the proposed discussion, it could not be further postponed. He saw Mr. Williams present, and as he was a practical chemist he should like to hear his opinions as to Mr. Hardwich's formula.

Mr. Williams said he had tried Mr. Hardwich's formula. He mixed the acids in the proportions, and according to the directions as to temperature, &c., given; but, when he placed the cotton in the liquid, it dissolved entirely. He knew that Mr. Hockin and other persons had also tried the process, and they had also failed. Mr. Hardwich might possibly be able to explain the cause of their failure. He could say that the proportions were totally different in Mr. Hardwich's formula from those which he had ever employed, and therefore it was quite possible he had entered upon the experiment with some little prejudice against the formula. His own mode of operation was to mix

40 oz. sulphuric acid ..............................S.G. 1·846
64 oz. nitric acid .... ,, 1·45

the temperature would then show about 115° Fahrenheit. Eight ounces of cotton then to be immersed, and the vessel containing the whole submitted to the action of a sand bath until the temperature became elevated to 160° Fahrenheit, when the operation is stopped,—the time occupied varying from ten to twenty minutes.

Mr. Malone said, after the important phase the discussion had assumed in consequence of Mr. Williams's statement, he (Mr. Malone) considered himself justified in rising to state his own experience, which was quite of an opposite character. The very first time he tried he succeeded perfectly; but there was an extraordinary discrepancy between Mr. Williams's experience and his own, and in order to prevent any possibility of mistake he would state exactly what he did. He took one measure, viz., one fluid ounce of nitric acid, and ascertained the specific gravity of the acid, first proving his specific gravity bottle to ascertain that it was perfectly correct, for that was a matter of very great importance. He had even taken the pains to weigh water into the ounce measure which he used, and in doing so he found that it only held seven drachms, or one drachm less than it ought to do. Nothing was more common than errors of this kind in the measures ordinarily employed; and he might here observe that it was of the utmost importance, in conducting delicate operations like the present, that the apparatus employed should be carefully tested before being used, for that error alone was sufficient to cause failure in every trial. Then, having weighed just one fluid ounce of nitric acid—the specific gravity of which was stated to be 1·446, but which, by actual experiment made with the very accurate balance in the laboratory of the London Institution, he found to be a little higher, say 1·447 or 1·448. To this he added three fluid ounces of sulphuric acid, of the specific gravity of 1·842 or 1·844. The consequence was, that the acids were weaker than those recommended by Mr. Hardwich. Having mixed the acids in the proportion of one to three by volume, seven fluid drachms of water were added. The actual temperature of this mixture was fully 180° Fahrenheit. The acids were then allowed to cool down to 150° by one thermometer and 148° by another thermometer, which was nearer the truth. He mentioned these figures to show that his experiment was not one of chance, but that every point was accurately determined; and operators might be assured that unless they took similar precautions they would be liable to be misled. Well, then, with this mixture at 148°, he placed in it fifty grains of cotton, which had been previously treated with an alkaline solution, washed, and dried. After remaining in ten minutes the temperature was reduced some 3° or 4°. The cotton was then taken out and well washed in plenty of water. The whole process was the simplest matter in the world. He obtained sixty-eight grains, which he produced, and he was told he ought to be satisfied if he got fifty grains. Yet Mr. Williams and others had absolutely obtained nothing, the whole of the cotton being dissolved by the acid! How was that to be accounted for? He (Mr. Malone) could give no explanation of such an extraordinary discrepancy. No doubt the managers of the London Institution would allow their laboratory to be used for the purpose, as they had done on other occasions; and he would be happy to repeat his experiments before any competent person who might wish to investigate the subject, in order to place the matter beyond dispute. His success was not owing to his intercourse with Mr. Hardwich, although Mr. Hardwich had been very kind in the matter. He was convinced that any one could obtain the same result by taking the same precautions. Chemists knew that the action of these acids at a given temperature upon a given body was a definite action, and it was impossible it could be otherwise. Possibly the cause of the failure of Mr. Williams's experiments might be in the cotton, as that was an article which varied much in character. It was a matter of considerable difficulty to determine what was cellulose. He said that Messrs. Gilbert and Law, recently writing upon agricultural chemistry, had defined cellulose in rather a singular manner: they said that all vegetable substances which did not give way under acids might be regarded as woody fibre, and all that did give way might be regarded as the portion which constituted the food of animals. The substance used for the base of collodion not being definite, Mr. Hardwich had done the only thing he could do under the circumstances. He had said that he took a certain cotton, which he bought at a particular shop, which was of a particular growth; and he had told them at the same time that he had found cotton to vary as to the place at which it was grown, and even flax did so. It was to be borne in mind, also, that he could not tell when he obtained a piece of cotton how far it might be affected by oil or other impurities. Chemists could not take anything for granted; but, when they wished to secure successful results, they should treat the cotton with alkalies, in order to get it as definite as possible before using it. If, for instance, cotton were treated with caustic potash, and showed a yellow colour, the result would be that it would not dissolve in acids which otherwise would have dissolved it. In the experiments named by Mr. Williams it was possible that the cotton might be wrong, or it might be improperly cleansed, or it might have been imperfectly dried after cleansing, which was a very important matter, or there might be an error in the strength of the acids: it was impossible for him to determine which was the case of failure—it might be any or every one of these causes combined. The process was a very nice one, but with good and proper instruments it was easily worked. Mr. Malone, resuming the subject of his own experiments, said the cotton remained in the acids ten minutes. On taking it out it was tested with one of Mr. Newman's thermometers; and he might observe that a standard thermometer was a very valuable instrument, and he believed that Mr. Newman valued his thermometers at twenty guineas each. Although he did not recommend members to give twenty guineas for a thermometer, yet he recommended them to have their thermometers compared with a standard thermometer, for doing which there was an arrangement at Kew Observatory. Mr. Malone then exhibited some of his pyroxyline, which he remarked was not particularly rotten, and it cohered well. He took five grains of this cotton—put it to half an ounce of alcohol of the specific gravity of 0·806, distilled off chloride of calcium, and half-an-ounce of ether of the specific gravity of 0·725. Although in the manufacture it was not necessary to have everything absolutely pure, still if the acid or ether contained oxidised or ozonised particles the result would be unsatisfactory. The ether, a very good chemist had told him, should be neutral, but Mr. Hardwich believed that the ether ought to be alkaline; and at last he had found it so in all samples he had employed. The cotton was washed some hours in ordinary water—of course theoretically he should recommend distilled water, yet in practice he did not find it to be necessary; and he agreed with Mr. Hardwich that it was not desirable unnecessarily to refine upon a process. The five grains of pyroxyline being dissolved in alcohol of the specific gravity of ·805 or ·806, and ether ·725, he had added two grains of iodide of potassium and two grains of iodide of cadmium; and here he remarked that all chemicals were not to be found of the best quality at one place—for instance, if the best iodide of potassium were to be obtained at a certain house, it might be necessary to go elsewhere for the iodide of cadmium. He made that remark, not for the purpose of over-refining, but to show those at the head of the trade the importance of not leaving these matters entirely to assistants. At the same time, it must be remarked that amateurs must be prepared to pay the best price for the best articles. Mr. Malone then demonstrated to the Society that the pyroxyline which he had prepared was perfectly soluble in some ether and alcohol which he had brought with him. He then observed that the collodion which he thus obtained made a perfectly clear and tenacious film. Such was the result obtained by the formula which had been made public by the communication of Mr. Hardwich, and which he considered to be of great importance to the photographic world, notwithstanding the entertainment of a contrary opinion by other persons. Because the committee entertained a high opinion of Mr. Hardwich's collodion, and had given it the stamp of their approval, a neighbouring Society had thought fit to take the Photographic Society to task, alleging that its members did not know what they were

about. Mr. Malone would then tell that neighbouring Society that they knew perfectly well what they were about. No one had given the minute information respecting the manufacture of collodion which Mr. Hardwich had done, and by which he (Mr. Malone) had been enabled to make an excellent collodion, as might any other person. He must confess he believed Mr. Hardwich had been incited to obtain a perfect formula because he had felt rather galled at the remarks which had been made some few years since. Another maker of collodion, for instance, had said, "If it were not for my collodion, photographers might shut up shop." No doubt that gentleman was very lucky to have hit upon a good collodion "by rule of thumb;" but, if he were to shut up shop tomorrow, photographers would still be able to obtain a very good collodion by the process now published by Mr. Hardwich. Mr. Malone did not recommend all photographers to make their own collodion—on the contrary, he recommended them to go to a respectable maker; but the importance of the formula was not lessened because it was not desirable for each individual to become his own collodion manufacturer. The reason the Society published the report was that they found a really good thing, and were desirous of making it public. It was not for him to speak on behalf of the Committee, but he ventured to think, with regard to the other formulæ sent in, that they had acted kindly by *not* bringing forward all the points that struck them. The other formulæ sent in were imperfect. There was one in which the author had not quite made up his mind as to his formula, but recommended the Committee to try this or that. Surely this was not the business of the Committee: the gentlemen composing that body had not time to devote to the task of perfecting a person's imperfect formula. They had simply to inquire into the characteristics of formulæ as they were presented to them. Another formula sent in contained a fundamental objection. He believed that any formula that recommended paper as a base ought not to be received or considered. The gentleman who sent it in said, if they took Swedish filtering paper they would obtain what chemists knew to be a good cellulose. Any person acquainted with the manufacture of paper, as he (Mr. Malone) happened to be in the early period of his life, knew perfectly well that it was impossible for any person to tell what were the constituents of a piece of paper, and how far they might differ from another piece nominally of the same manufacture; in fact, it was a heterogeneous mass, some portions of which were soluble and others not. He knew an instance of a gentleman who had succeeded perfectly in making collodion with some Swedish paper, but upon taking another batch of the same manufacture, and treating it in precisely the same manner, he entirely failed. With regard to the sensitiveness of Mr. Hardwich's collodion various observations had been made, and even in the body of the report one gentleman stated that he had obtained a collodion twice as sensitive as that of Mr. Hardwich. The Committee had been taken to task for the contradictory nature of the report, but the apparent contradiction to which exception had been taken only showed the honesty with which the Committee had conducted its investigation. He (Mr. Malone) did not doubt for a moment but that Mr. Heath had stated what he believed to be true, but had he shown such a collodion as to be twice as sensitive as Mr. Hardwich's? Could he show it? He (Mr. Malone) thought he could not. If such a collodion could be obtained, it would have been advertised from one end of London to the other. He was anxious that Mr. Hardwich's labours should be properly appreciated: he had given them very important facts, and a collodion, he would not say better, but he would say as good as any other that could be procured. If manufacturers of collodion were candid, they would admit that they frequently found difficulties unexpectedly arising from the uncertainty of their process. He believed that Mr. Hardwich had given the clue to a means of producing this article with something like certainty; and, if so, he had conferred a very great boon upon the photographic public. He (Mr. Malone) was sure that the Committee would be happy to take into consideration any formula that might be presented by any competent experimenter.

Mr. HARDWICH wished, at this state of the proceedings, to remark that he should be exceedingly sorry to think that this was a formula that any practical man could not succeed with. He thought he was justified in stating that Mr. Williams had written to him, and had told him that his time was very much occupied in the manufacture of various chemicals, and that he had given his (Mr. Hardwich's) formula for making collodion a trial once, and it broke down. He had heard Mr. Hockin's name mentioned as one of those who had failed with his formula. He believed that Mr. Hockin himself had a process for making collodion which he possibly considered a better one. If not, probably he would have succeeded. He was very sorry that it should go forth in print that his process had been tried and failed. Mr. Malone had tested the formula in a very philosophical manner, and with successful results; but he was sure Mr. Malone did not wish to convey the impression that success was only obtainable by these extraordinary precautions. Everything which had been published about this formula as yet was against it; but the meeting was not to suppose that no one had been successful. He (Mr. Hardwich) had received letters reporting success on the first trial; but, whereas failures generally found their way into print, successes were seldom reported. The question, he apprehended, for the Society to consider was, whether his formula gave better and more certain results than any other published formula? If it did not, then they should cease to trouble themselves about it. The manipulation required care, but not more than a maker who desired to produce the article would be willing to give. The question had been put to him by Mr. Williams, Why did the cotton dissolve in the acids? If the whole of the cotton dissolved, he should say that more water had been employed than the formula indicated; but if only a part of the cotton disappeared, and, say only a quarter could be got out, this might depend upon the cotton being imperfectly cleaned, or upon the acids being contaminated with chlorine. He found that the more water he used in the acids *up to a certain point*, the better was the collodion. If made with less water some small defects—perhaps a streak here and there that interfered with the perfect uniformity of the background, such as the amateur did not see, but which the professional photographer did see—were apt to occur. In fact, the amateur might obtain a very respectable collodion, and with greater certainty, by using less water than was recommended in the formula given. He had purposely allowed for a range between the maximum and minimum of water in drawing up the formula. The question, he repeated, for the consideration of the Society was simply whether the formula was worth the trouble which had been bestowed upon it?

Mr. WILLIAMS said that his experiment certainly was not made with that care which he should have taken had he known that he would have been called upon to express an opinion on the formula. He only stated his experience because the Chairman invited him to do so.

Mr. MALONE said that if his remarks had appeared unusually warm, they were so because persons had stigmatised the Society elsewhere, and even in its own Journal, in a most extraordinary manner.

Mr. HEATH said it might be his misfortune that it had fallen to his lot to originate this discussion. He had, on a previous occasion, used expressions which he trusted were perfectly friendly to Mr. Hardwich, and conveyed in a tone which he hoped he should always use in that room, but which the circumstances fully justified; consequently, the remarks Mr. Malone had made did not apply to him—("No, no," from Mr. Malone). At the same time, he was compelled to say that he saw no reason, from anything which had since transpired, to alter one single expression he had used on that occasion. He believed this subject was still misunderstood. He entertained the highest opinion of Mr. Hardwich's collodion; but he remembered how that Committee was formed, in the first instance—not to consider the best method of making collodion, but to consider Mr. Hardwich's collodion. ("No, no.") Such, he believed, was the case.

Mr. MALONE acknowledged that that was the original intention of the Committee; but it was modified, so as to admit other collodions.

Mr. HEATH asked why this resolution was afterwards modified? because it was found that it could not be entertained in its original form. And if so, why was Mr. Hardwich's collodion placed in such a prominent position in the report? He would ask Mr. Malone if it were at all likely that men whose business it was to manufacture collodion would come forward and publish their formulæ? It did not follow that, because Mr. Hardwich's collodion was good, that other collodions were not so. If the injustice done to other manufacturers in the report, by the grammatical error of employing the comparative degree where no comparison had been made, could be altered, and if the report could be regarded as only conveying the opinions of the gentlemen who signed it, and not as pledging the Society to the opinion expressed in the report, then let it remain on the transactions of the Society, and let the Society at once make all the acknowledgments that were due to Mr. Hardwich for his painstaking experiments. He (Mr. Heath) would never use that room to vaunt the names of other collodion manufacturers; but Mr. Malone, in speaking of the sensitiveness of Mr. Hardwich's collodion, had thrown down the gauntlet. He (Mr. Heath) would take it up, and he would undertake to prove to Mr. Malone any time he pleased, that there was a collodion in the market not only two-to-one, but three-to-one more sensitive than that of Mr. Hardwich's.

Mr. MALONE admitted that he thought the report was open to verbal criticism, and in Committee he had suggested one or two verbal alterations. Thus, the term "superior excellence" had been objected to, and possibly a more guarded expression might have been employed; but if it were said of any gentleman present that he was a man of "superior mind," did it follow that he was to be regarded as the best man in the assembly? And yet that was the construction attempted to be put upon the expression used in the report. The report really only attempted to convey the truth, in stating that the collodion was of superior excellence. He must say that he was no believer in universal collodion; he believed that it would have to be modified to suit the particular work and season. But as a normal collodion, he knew of none equal to that of Mr. Hardwich. He did not wish to speak disingenuously, but he was only speaking the truth when he said that the strongest opposition to the report came from parties who were personally intimate with the makers of other collodions; therefore, it was perhaps excusable that gentlemen whose interests might be touched should scrutinise the report very closely. He thought that the Society ought to come to a decision that evening, and accept the report; and that the Committee ought to be thanked for the pains they had taken and the desire they had shown to investigate the formula that was brought before them. He thought Mr. Williams would confirm his statement, that photographic investigations would assist chemical science. When he first went to the College of Chemistry, he was told that ammonia did not precipitate oxide of silver. This was contrary to his photographic experience; and he found that the statement arose because a very weak solution of silver had been usually employed for analytical work in the laboratory, so that

the oxide was dissolved as fast as it was precipitated, which would not be the case if strong solution of silver were used. Again, it was stated, by an authority, that ether ought to be neutral; and yet Mr. Hardwich always found that it proved alkaline. With regard to the challenge of Mr. Heath, he was astonished at the statement that there was a collodion three times more sensitive than that of Mr. Hardwich; and could not understand why he had not brought that collodion before the Committee. He accepted the challenge, but he questioned whether Mr. Heath could produce such a collodion.

Mr. Heath asked Mr. Malone the real English of "unsurpassed sensitiveness," for that also appeared in the report.

Mr. Malone said that was answered by the same argument as he had used as to the "superior excellence."

The Chairman said he presided at the meeting of the committee at which the report was arranged. It was criticised verbally throughout, and was the result of the deliberation of all the members present, who spent two hours in settling the wording, and he believed they ought not to alter a single word. The arrangements for furnishing a report were these:—A committee agreed that its various members should work separately. At the end of the year they were requested by letter to send in their individual reports to Mr. Fenton, who drew up the draft of the report, incorporating the sentiments of the individual members. It was the opinion of the majority that the collodion was unsurpassed in sensitiveness. When the majority of the members said unsurpassed, they meant in regard to their previous experience; and if their opinion was favourable to Mr. Hardwich, he did not think that the trade, or Mr. Heath, or any one else had a right to find fault with it. Then the last sentence of the report was objected to. He did not think that the words "superior excellence" could with fairness be objected to. The expression was comparative, but not superlative. It was not thereby meant that the collodion was *the* best, but one of the best in the market. Of course it was not the interest of the Society to encourage secrets. If the manufacturers of collodion did not choose to compete or communicate their formulæ, the Society was open to obtain the best formula it could in which the whole process was described; and, if Mr. Hardwich was good enough to communicate his process, there was no impropriety in the Society receiving the report and stamping it with its approbation. He thought that the photographic world was as much indebted to Mr. Hardwich as it had formerly been to Mr. Archer. He did not interpret the report as Mr. Heath read it; and he, as a member of the Committee, did not feel disposed to alter a single word.

Mr. Hughes said he could hardly allow the occasion to pass without calling the attention of the meeting to the very emphatic observations made by Mr. Heath on a former occasion, and equally emphatic on this. In the report the individual opinions of the members were certainly fully expressed; but, whilst the expressions as to the merits of the collodion were only generally noticed, the faults discovered by each operator were specially pointed out: but this very candour of the report seemed to defeat its object, and it was called contradictory when it was only just. Mr. Heath upon a former occasion objected to the Committee being appointed.

Mr. Heath begged Mr. Hughes's pardon, and said "No."

Mr. Hughes had a most vivid remembrance of the words.

Mr. Heath said he did not object to the appointment of the Committee. His observation was, that the Committee was appointed for a distinct and specific purpose; and, because no other formulæ were sent but that from Mr. Hardwich, the object of its appointment could not be carried out, and therefore the Committee virtually ceased to exist.

Mr. Hughes understood Mr. Heath to say—first, that it never should have been appointed; next, that it should not have sent in its report; and, finally, that the report was contradictory. Now, supposing that the Committee had been appointed conditionally upon formulæ being sent in, and only one gentleman sent in such formula, and other samples were sent in without the formulæ, and the Committee had compared those various samples of collodion, or suppose they compared this collodion with others well known, what would be the consequence? If the report had been laudatory of any one of those collodions, it would clearly have been an advertisement for the maker; but, supposing that that individual maker had died, and taken his secret with him, where would have been the advantage to the photographic world? Or, on the other hand, supposing the Committee had condemned these other collodions, then the various manufacturers would have come forward, and have said, "Why did you condemn our particular collodion? We never courted your Committee. We held aloof from you, and why did not you hold aloof from us?" And now it was because the Committee did not report on other known collodions, the formulæ of which were not sent in, that this charge was made against it. The Committee, in justice to Mr. Hardwich, could do no otherwise than it did. Only one formula was before it,—was that one submitted to their notice by a gentleman likely to give a valuable one? He thought that there was no question on that point. On that Committee were some of the most distinguished photographers the world ever produced; and if a Committee of such a character met together, and gave their recorded observations of many months' work, and presented a report, he held that their opinions ought to be received with respect by any Society, and more particularly by that Society.

Mr. Hardwich said that at that late hour in the evening he would endeavour to be as brief as possible. He did not think that there were many in that room who could exactly understand his feelings in the matter. The discoverer of the collodion process was Mr. Archer, and what was being done now was simply to improve the details of his process. He (Mr. Hardwich) did not care about seeing his name in connection with the making of collodion; but he had been a maker for the last three years, had made large quantities, and had experienced many vexations. He had, for instance, sent collodion to India, and had received letters saying that when it had arrived there it was utterly useless. This sample had been made of linen. The same thing happened, though not with his collodion, to a gentleman travelling in the interior of Africa, to whom it occasioned a loss of six months after all his materials and apparatus were out there. He had consoled himself with the idea that the moment he had any formula that could honestly be reported upon he would lay it before the society. Had collodion been left in the position Mr. Archer had left it the data would be very unsatisfactory. The real truth was, that in collodion little matters were of the greatest consequence, and unless these were experimentally determined they would never have an article that could be depended on. He did not wish to set himself up as a martyr: on the contrary, he admitted he had been very successful commercially, and was perfectly satisfied; and now that he had settled the formula, he invited its examination by the society. If another manufacturer could produce a collodion three times as sensitive as his own, he should be exceedingly delighted, because such a collodion would be a great boon, and he would advise the Committee to take that collodion into consideration, even if the maker declined to publish the formula; but he must say, candidly, that at present he had a firm conviction in his own mind that that assertion could not be substantiated. If it could, he would be the first to praise it. It was not his intention to allude to the subject again, but he should keep a strict look-out upon what was doing; and if any one introduced an improvement, he should catch hold of it, and tack it on to his formula. He did not think any injury had been done by the discussion. He met some gentlemen the other day, who said that good collodion could be procured all over London, and were quite at a loss to understand why this Society should be taking so much trouble about a formula. The Committee, however, entertained a very different opinion. He could understand individual members entertaining objections to this movement, without attributing to them illiberal motives—("Hear, hear," from Mr. Heath). He did not consider the question of the manufacture of collodion could be settled till every minute particularity connected with the subject had been ascertained, and especially as to how samples would be affected in India, Africa, Australia, and other places. He allowed, then, there were weak points—as, for instance, the manufacture of ether. There were very few persons who made ether—not more than three or four—so that part of the subject rested with them. He thought if the Society spent £100 upon the investigation of the subject as to what ether was, it would not be wasted. They must find out the cause which makes some collodion, with the iodising solution, perfectly red. Then there were so many sorts of cotton, and, supposing those cottons to be equally cleansed, would they all agree in character? It was his impression that they would; but this had not been proved. All one could do was to go to the maker, and inquire into the growth of it. He believed if these two points were settled, the formula would be in a better position than it was at the present moment, and he was convinced the inquiry would result in good to the cause of photography.

The Chairman announced that, at the next meeting, Mr. Dallmeyer would read a paper *On Distortion, as Produced by the Present Form of Lenses, and on an Improved Description of Lens, Free from this Defect.*

The meeting was afterwards adjourned.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of the above Association was held at Myddleton Hall, Islington, on Wednesday, the 25th ult. George Shadbolt, V.P., occupied the chair.

Mr. Hill, Treasurer, officiated as Secretary, in the absence of Mr. J. Barnett.

The minutes of the last meeting having been read and confirmed,

Mr. George Dawson read a paper *On the Reaction of Chloride of Silver upon the Hyposulphite of Soda.* [See page 127, No. 117.] Mr. Dawson during the reading exhibited two halves of a stereographic print, produced by floating paper on the liquid alluded to in his paper, and demonstrated to consist of chloride of sodium *only* in solution, after the hypo. solution had been acted on by chloride of silver, as described. After being dried the paper was then sensitised on a nitrate of silver bath, exposed under a stereoscopic negative, and one half fixed by hypo. and the other by ammonia, the result being well-marked ordinary positive prints, thus serving as an *experimentum crucis* to the chemical tests employed.

After the conclusion of the paper, a general murmur of applause followed, and the Chairman remarked that it was unnecessary to propose the thanks of the meeting to Mr. Dawson for his paper, as they had been already spontaneously accorded. He observed that a paper like that they had just listened to left but little room for discussion, as it was so utterly conclusive; still the meeting would be glad to hear any observations upon it.

Mr. Hill inquired whether some test had not been suggested for detecting the presence of hyposulphite of soda?

Mr. Dawson considered that the testing was not of much importance with regard to paper photographs, inasmuch as if any hyposulphite were left in it, heating the print would by the scent evolved infallibly betray its presence. He mentioned the importance of having an alkaline fixing bath, in order to avoid the possible chance of sulphurisation, and adverted to the weakness of the solution employed by MM. Davanne and Girard.

The Chairman adverted to Mr. Maxwell Lyte's plan of diffusing chalk in the fixing bath.

A somewhat desultory though instructive conversation then ensued between Messrs. Barker, Hill, G. W. Simpson, and Dawson, on printing and toning generally, during which it was remarked that the successful use of the chloride of sodium solution, produced from the hyposulphite of soda by the reaction of the chloride of silver, as a salting solution for printing paper, was a most convincing proof of the absence of any hyposulphite solution remaining.

Mr. Hannaford demurred to this, and stated that he should have expected *a priori* that solution of hyposulphite of soda perfectly saturated with chloride of sodium, used as a salting solution for paper, which should be subsequently sensitised with nitrate of silver, would produce a print.

The Chairman thought that Mr. Hannaford probably had not been able to follow the reading of the paper closely, as he would have seen that the case supposed by him could not have occurred.

Mr. Hannaford explained that as a solution of cyanide of potassium, saturated with chloride of silver, could be used to prepare printing paper to be sensitised on a nitrate of silver bath, analogy would lead one to imagine that the same effect might follow with the hyposulphite of soda solution as the solvent.

The Chairman pointed out that the two cases were not analogous. Mr. Hannaford had forgotten, that in drying, the cyanide solution became decomposed, the cyanogen escaping in the form of hydrocyanic acid, leaving naught but the chloride of silver behind; whereas with hyposulphite of soda, even supposing it possible for it to be saturated with chloride of silver, the same reaction could not occur.

The following letter from the Secretary, who was absent from indisposition, was then read:—

April 25th, 1860.

Gentlemen,—I much regret that I cannot be with you this evening. I am suffering from an attack in the throat; my medical attendant prohibits my leaving the house. I intended asking a few questions respecting the extremely unsightly appearance of the portraits you will find in the minute book. The albumenised paper is old, the nitrate bath sixty grains to the ounce, new hypo., and used for those pictures only; it became quite discoloured: the gold I used was of the strength of one grain to six ounces distilled water, and no *soda*. Can this be the cause? You will see some of the pictures have an ungrained, mottled appearance, as though the size or albumen were decomposed. More flat, dead, dull, and unsightly prints I never produced, and the negative will and has produced some excellent and bold results.—I am, Gentlemen, yours, &c.

The Committee North London Photographic Association. J. Barnett.

The prints alluded to were then handed round, being, as described, dull, flat, and presenting the appearance of what Mr. Hughes called on a former occasion "measly spots," though evidently printed from good negatives.

Mr. Dawson demonstrated that the unsightly appearance was not due to sulphurisation by warming a print at the fire. After some discussion the opinion pretty unanimously expressed was, that some decomposition of the albumen may have arisen from keeping the paper long, the original practice of coagulating the albumen by heat having been abandoned by many manufacturers; that the time allowed on the nitrate bath might have been insufficient to convert all the chloride into chloride of silver, and at the same time leave a sufficient excess of free nitrate to produce a vigorous print; and, lastly, that the acid chloride of gold may have removed a portion of the starch in the paper, and the prints being probably removed *direct* from the toning to the fixing bath without an intermediate washing, the latter may have become decomposed by the acidity of the former.

The Chairman exhibited two proofs from negatives of Trinity College, Dublin, taken with an aplanatic lens (Mr. Grubb's) of nine inches focus, and covering a plate ten by eight inches, by which an angle of view of 60° was included. These excited considerable curiosity and attention.

Mr. Goslett exhibited some specimens of glass taken from an operating-room, showing a considerable darkening of the colour from exposure to light, as was manifest from the part which had been covered by the putty retaining its pristine colourless brilliancy.

The Chairman reminded the members that this fact had been pointed out by Mr. Forrest, of Liverpool, more than a year and a-half ago, and in precisely the same way. That gentleman had shown that some glass of ancient date, taken out of a window of a cathedral or other ecclesiastical edifice, had, where covered with the putty, kept its colour, while the exposed part was darkened to a surprising degree.

Mr. Goslett had not been aware of the fact having been before noted, and was pleased at the corroboration.

Mr. Hare exhibited one of his very portable folding stereoscopic bilens cameras, with box and several spare backs, similar to one shown at a previous meeting, but with a few more improvements adopted from observations which he had noted on the former occasion. The camera in its present form received general approval.

The following gentlemen were duly elected members of the Association, viz., Messrs. Francis Bedford, H. J. Godbold, King, and Bawtree.

Votes of thanks to Messrs. Dawson, Goslett, Hare, &c., having been passed, the meeting adjourned at an unusually late hour.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

This Society met in George Street Hall, on Tuesday, the 8th instant. The chair was occupied by the president, Sir David Brewster.

The following gentlemen were elected ordinary members:—Mr. Thomas Elder and Mr. R. Murray.

The Secretary then read a paper from Mons. A. Claudet, of London, *On Photography in its Relation to the Fine Arts*. [See page 146.]

After the reading of M. Claudet's paper,

Mr. C. J. Burnett read a few remarks *On Burning-in Photographs on Porcelain*. His remarks were supposed to be, that it was advantageous to this operation that in certain cases the muffle in which the burning-in is performed should be filled with hydrogen, or even carburetted hydrogen gas in lieu of common air. His principal remarks, however, were relative to some part which the Blackheath Society had taken in giving to Niepce de St. Victor the merit of applying uranium salts to photographic purposes, a merit which he considered due to himself.

Mr. Walker protested against Mr. Burnett's introducing such subjects, which were quite foreign to the subject he had announced as his paper.

Mr. Taylor said that he himself had no doubt as to the superior claims of Mr. Burnett in this matter; still he could not agree to such strongly-expressed opinions against the Blackheath Society, as he considered that that Society had, in a sensible and straightforward official letter, entirely set the matter at rest.

Mr. Tunny thought that it was the duty of the Society to see that no one appropriated the valuable discoveries of Mr. Burnett, to whom the Society lay under a debt of gratitude.

Sir David Brewster said that certainly the Society would protect its members in such matters, and that the best way would be to propose a small committee to investigate and report on the rival claims of Mr. Burnett and M. Niepce.

This suggestion was adopted, and the following gentlemen were appointed:—Messrs. Walker, Johnston, and Tunny.

The Chairman said he had a subject to bring before the Society. It was an invention of Mr. Walter Hardie, of Edinburgh, by which duplicate pictures could be taken for the stereoscope from a single picture—that is, a left eye view being given, a right eye view could be produced. Considering that there would be no time that evening to read the paper describing this invention, he would, if the Society agreed to adopt it as part of their proceedings, send the paper for publication along with the other transactions of the evening. This was agreed to.

The Secretary then read the Council's Annual Report, which was to the following effect:—

That on the termination of the fourth year of the Society's existence, they were happy in being able to report that during the past year the success which had hitherto attended the Society in all its departments had been fully maintained. An addition of upwards of twenty three members had been made to the roll of the Society,—an addition which included not only many enthusiastic and successful amateurs, but also some of the chief professional photographers in the kingdom. Nor was the list of members of the Society now confined to residents in this country; in India, as well as in different parts o Europe, the Society had members, who doubtless would be valuable contributors to the exhibitions and to the meeting of the Society.

The Society had sustained a great loss by the death of one of its most distinguished members, Professor George Wilson. Taking a lively interest in everything connected with the art, although not himself a practical photographer, he was ever ready to give to the Society the information which he possessed. The communications which from time to time he made to the Society were of the most valuable and suggestive kind; and there would be no doubt that, had he been spared to prosecute his researches, he would have done much to advance a knowledge of the chemistry of photography.

The Fourth Exhibition of the Society had been again held in the Exhibition Rooms of last year, No. 90, George Street. Although, from various causes, several members had been prevented from contributing as they had done on previous occasions, a larger collection of works was sent in than had ever before been received, several of the chief photographers in England contributing for the first time. For evidence of the excellence of the exhibition itself, the Council would refer to the various critiques which appeared in the newspapers and photographic journals. These, almost without exception, pronounced the exhibition to be greatly in advance of any previous exhibition, either in Edinburgh or elsewhere.

Excellent as the exhibition was, however, the profits arising from it, after clearing all expenses, although very considerable, had not been so great as those from the exhibition of last year. This the Council thought might be accounted for by the severity of the weather during the greater part of the period that the exhibition was open.

The Society's Medal had been this year awarded to Mr. H. P. Robinson and Mr. James Mudd, and the Maconochie Wellwood Prize to Mr. Thomas Rodger. It was believed that this award of the prizes had given general satisfaction.

During the past year several interesting and valuable papers had been read at the monthly meetings; and several new processes, and improvements on the processes already in use, had been brought before the Society. The most remarkable of these was the wort process for preserving the sensitiveness of collodion plates, which had been invented by Mr. Macnair; for which invention the Council would recommend that the Society should award a bronze medal to him.

Members of this Society had been supplied gratis during the past year with the *Journal of the Photographic Society*. The Council proposed that this arrangement should be continued, with this modification, that as some members did not care to have that Journal, such members should be supplied in lieu thereof with photographs of the same price, purchased at the next exhibition of the Society.

The Secretary, Mr. Kinnear, having expressed a wish to retire, the Council had secured the services of Mr. Adam, who they doubted not would fill the office in a satisfactory manner.

An abstract of the Treasurer's account was then read, which showed a balance in favour of the Society of £315 12s. 8d., the balance at the close of last year being £229 9s. 9d.

Sheriff Hallard said he had been requested to propose the following gentlemen as office-bearers for the ensuing year:—

President — Sir David Brewster.
Vice-Presidents — Horatio Ross and George Moir.
Secretary — A. F. Adam. | *Treasurer* — H. G. Watson.
Council —

Alex. Young Herries.	W. S. Elliot.
George Harvey.	W. Walker.
T. M. Raven.	C. Kinnear.
T. B. Johnston.	John Moffat.

Auditor — John Cay.

This was agreed to, and the meeting separated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The last meeting for the session of this Society was held at the rooms of the Literary and Philosophical Society on Wednesday, the 2nd inst., —W. T. Mabley, Esq., in the chair.

The Hon. Secretary announced to the members that the Council had resolved to continue the usual monthly meetings of the Society throughout the summer, as many of the members had expressed a wish to have the opportunity of meeting each other all the year round.

Mr. A. Brothers said he wished to call the attention of the Hon. Secretary to the report of the proceedings of the last meeting in the organ of this Society,* which stated rather incorrectly some remarks he had made — namely, that he (Mr. Brothers) had found that the alkaline toning bath was very liable to remove the albumen from the paper. What he had said was, that an alkaline nitrate of silver bath was liable to dissolve the albumen, but he had found that by adding acetic acid the effect quite ceased.

The Chairman then called upon Professor Roscoe, who read a paper, entitled *Some Points Concerning the Measurement of the Chemical Action of Light.*

At the commencement Dr. Roscoe noticed the great importance of the establishment of an accurate means of measuring the chemically active rays, as a step towards attaining a knowledge of the fundamental laws regulating photo-chemical actions; of which, notwithstanding the great progress made in practical photography, we know as yet almost nothing. The principles upon which the chemical photometer depends were then explained, and experiments illustrating these principles were shown (see *Philosophical Transactions*, 1857, p. 355). As examples of the results obtained by the employment of this instrument, the method was described by which the amount of chemically active light emanating directly from the sun had been measured. It appears that at two different times on the same day the rays contained in direct sunlight are capable of producing equal chemical effects when the sun is at the same height above the horizon and the sky is cloudless; thus the chemical action produced by direct sunlight alone at nine A.M. and at three P.M., at eleven A.M. and one P.M., &c., is the same. The chemical action effected by the whole diffused daylight had been likewise measured, the amount produced at an equal distance before or after noon being likewise the same. These statements were only true where the whole of the direct sunlight or diffuse daylight from a perfectly cloudless sky was examined. Photographers working in covered rooms, with various aspects, must naturally arrive at totally different conclusions. The laws regulating the variation of the photo-chemical intensity of direct solar and diffused daylight with the height of the sun above the horizon was next pointed out. From these laws many most interesting conclusions could be drawn; thus, for instance, it was seen that at every point upon the earth's surface, where the sun did not rise beyond a certain height, the chemical action produced by the total diffuse light was, during a part of the day, greater than that produced by direct sunlight. When the sun rose beyond this height the direct sunlight effected a greater chemical action than the total diffuse daylight, and between these situations there was a time when the chemical energy of these two sources was equal: this point is called the phase of equal chemical intensity. As another instance of the results attained by the method in question, Professor Roscoe described the experiments made for the purpose of determining the amount of chemical action effected by the variously coloured rays of the solar spectrum, and by help of diagrams and experiments illustrated this part of the subject. He concluded his communication by urging the necessity of having a simple and accurate method for registering the daily and yearly variation of chemical light falling from the sun upon the earth, not only as affording to photography a great help, but as furnishing important data towards an entirely new field of meteorological research.

After a very animated and interesting discussion upon the subject of Dr. Roscoe's paper, a vote of thanks being passed to that gentleman and to the chairman, the proceedings terminated.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Society was held on Wednesday, the 9th instant. Mr. Griffiths, one of the Vice-Presidents, occupied the chair.

The minutes of the last meeting were read and confirmed.

A letter from the Honorary Secretary of the Manchester Photographic Society was read, requesting the assistance and co-operation of the Society in the exhibition of photographs about to be held at the Salford Royal Museum and Library, Peel Park. Several specimens were promised.

A discussion followed on the paper read by Mr. Griffiths at the last meeting, *On a New Dry Collodion Process.* [See page 111, No. 116.]

The members who expressed their opinions were much pleased with the result, except as regards loosening of the film, which some had experienced.

Mr. Green found, by mixing a small quantity of albumen with the milk, that that was obviated.

Mr. Griffiths explained that, as he named in his paper, a coating of varnish round the edge of the glass would prevent that defect, which was very liable to take place with some collodion; it might be done after developing, when the film was surface-dry, as the risk of splitting was greatest after using hypo. or cyanide for fixing. He had found the mixing of albumen with the milk to give a peculiar redness to the negative, which he would rather not have. He had intended to state to the meeting his views and opinions as to making photographic societies more generally useful; but he should content himself by giving an outline of them, leaving the next meeting to consider them more fully. He considered that every member should do something to add to the common fund of information; and he should like to see a register of every member's name, and the processes that he could work, so that when there was no very important business on hand the register should be brought out, and each member in turn give the mode he employed of working. Much discussion would follow which would be profitable to the members present.

Mr. Ashley afterwards described the way that he had worked in taking portraits by artificial light, and Mr. Fawcett also gave his mode. Both gentlemen promised to show to the next meeting specimens of their productions.

A vote of thanks to the Chairman concluded the business.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The third ordinary meeting of the above Society was held on Thursday evening, the 3rd instant. The President, J. Kibble, Esq., occupied the chair.

The minutes of last meeting having been read, and five new members ballotted for and unanimously admitted, the President read a paper *On the Influence of Light and Heat in Changing the Physical Properties of Bodies.* [See page 144.]

A short conversation followed the reading of the paper.

Mr. Bowman exhibited a dark cell for non-reversed pictures, which he had found to answer the purpose remarkably well.

Three highly-coloured miniatures on ivory were submitted to the meeting, and were much admired. These had been printed by Mr. Stuart's process (which he described at last meeting).

A vote of thanks having been awarded to Mr. Kibble for his most interesting paper, the Chairman intimated that, in consequence of the recess, the next meeting would not be held till the first Thursday of October. The meeting then terminated.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

If your photograph should chance to be one of those dull specimens which would destroy the purity and character of the transparent flesh-wash recommended, adopt another, composed of madder-pink and pale lemon-yellow or Naples yellow (the first is the better because most permanent), and then proceed to hatch upon this with the tint of the first wash, &c., as described. This second wash being semi-opaque, will cover and kill the grey tint of a bad or indifferent photograph better than the wash of purely transparent colours. If Naples yellow be adopted, you must remember that there are two preparations of this pigment — the one cold and greenish, the other warm — named respectively No. 1 and No. 2. The warm is the better for flesh tints; but if you use the cold for the wash in question, it must be corrected with a larger proportion of madder-pink. Beginners should use the warm. At this stage your photograph should be but faintly tinged with colour, and if the colours appear too positive or strong reduce them by working upon the surface with *pure* water only; or wash them partially off with a *soft* clean brush and water, using blotting paper to absorb the superfluous moisture — adopting the latter plan if all the colours applied are too powerful, and the former if such is the case in parts only. After washing off, the surface of the paper is sometimes found to be rubbed up; to harden and smooth which take an agate burnisher, and placing your print upon a sheet of polished plate glass, lay over the surface disturbed a piece of *clean* smooth writing paper, and firmly, and with an even steady pressure, rub it down with the burnisher until it is again glossy and hard. The

* Our report being an "official" one, the MS. copy furnished to us is of course our guide in the matter. We are not therefore personally responsible for the error noticed. —Ed.

burnisher may of course be used for this purpose whenever necessary. To such colourists as labour long at a picture, or wash frequently, it is indispensable.

THE GREYS.*

(See Maxims 41, 43, 13, 19, 16, 39, 32, 37, 54, 55, 56.)

Now mix a little Indian yellow and cobalt, using just enough of the former to give the latter a *slightly* greenish effect, and with this hatch over such of the demi-tints as by careful attention in examining your model you find assimilate to the hue obtained in working with this over the corresponding tints of your photograph. Here, as before, substitute the more opaque lemon or Naples yellow for specimens which are either bad ones, too dark, or ill-printed. In this and all other directions for compounding the tints of flesh (more especially the greys), you must consult your model, inasmuch as they not only invariably differ in different complexions, but also in their different positions. Where the skin is yellow they are most green; where whiter, most blue; where ruddy, most purple; where pink, of a violet hue, &c.; but in all parts of the flesh they abound.

Having worked in this slightly-greenish grey, take next a little ochre, cobalt, and madder-pink for such greys as are to be found upon the edges of shadows or upon the retiring surfaces. The same mixture will be useful in softening the eyebrows into the flesh, and working near or upon the outline of hair which cuts against the brow or cheek. On the cheek, owing to the presence of the carnation, the grey will be composed of cobalt and pink-madder; and the same hue may be used in rounding that part of the chin which is pinky in colour: it may also be selected for the half-tints of the eyelids, and used near that corner of the eye which is nearest the nose, on the receding outline of the nose itself, &c., as due examination of your model may decide. A little more or less of the pink or blue will be used in this mixture according to the effect desired, and sometimes a little Indian yellow may be added to destroy to some extent the purplish tone. In applying these colours, the tints covered having their part in securing the desirable effects, you must not use them unmodified for putting in half-tints which, although not secured in the photograph, exist in nature.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

Miss D., Kingsland.—I am sorry to say you have failed; but you must not forget that in undertaking the management of such a large mass of flesh you had a task of extreme difficulty. In addition to my own remarks, read these by G. Barnard:—"But there are other causes that influence this delicate study [that of flesh]. These are, the gloss or oily smoothness of the skin; the almost imperceptible down with which it is covered, but which produces a greyish tint; and the semi-transparency of the surface skin, showing the light through, as well as the blue veins, whether in light or shade. This effect of transparency or transmitted light has considerable power, as may be proved by tearing an orange in half, and looking at the pulp in shadow and in light—the deepest colour will still be deepened and greyed orange or crimson. The same with the shadow between the petals of a rose, or between rosy fingers, which no one would think of painting green. The colour of shadow must therefore be influenced by the part in light and the colour it assumes." This quotation will point out your sins of omission and commission more effectually than a few critical remarks upon your picture, and will at the same time be useful to others.

A. S.—If you must put in such pretentious landscape backgrounds you should at least know something about linear and aërial perspective, the symetrical arrangement of lines, the laws of *chiar'scuro* and harmonious colouring, &c., otherwise you will merely offend the eye of every tasteful observer, and destroy your picture's value. The importance of such a study should be obvious, for all your labour will be misdirected and vain without its aid. You must not expect me to write an essay on æsthetics in order that I may induce you to give attention to a subject the importance of which is admitted by all authorities, and instinctively recognised even by those totally ignorant of its theory. Lines must be as judiciously balanced as masses of colour and light and shadow. I would advise you (and all photographers) to give serious attention to the subject of composition and *chiar'scuro*.—See the works of Burnett, Sir Joshua Reynolds, &c.

Foreign Correspondence.

Paris, May 10, 1860.

M. Niepce de Saint Victor, continuing to persevere with his studies upon the persistent activity of light, has just published another experiment bearing upon the great question of "bottled light," undertaken with the view of ascertaining how long a time light would retain its activity in darkness.

In this experiment M. Niepce opened a tin tube, which was soldered up on the 4th of June last (1859). The interior of this tube was lined with cardboard, impregnated with tartaric acid (any other organic acid gives the same result), then exposed for some hours to the light of the sun. The cardboard inclosed within the tin tube was covered, and the cover soldered down. M. Niepce observed that the soldering was imperfect, admitting the light. In this state the tube has been kept (in the dark?) eleven months. Immediately upon its being opened, M. Niepce threw some drops of a solution of nitrate of silver into the tube, and closed it again. The tube being re-opened in a few minutes, the nitrate of silver was found blackened, forming spots of great intensity upon the cardboard. It appears from this that not only the luminous activity acquired by the cardboard impregnated with tartaric acid is retained for this long space of time, but also that it has lost nothing of its power; the reduction of the silver was as prompt and complete as when a tube is opened after the lapse of a few days.

One of our most accomplished photographers has announced the following method of obtaining direct transparent positives:—Take a collodion iodised with iodide of cadmium, sensitise in a silver bath of the strength of thirty grains to the ounce, dissolve in this bath, little by little, as much iodide of cadmium as it will take up; immerse the collodion plate in it as usual, then expose in the camera double the time required for a negative, and develop with pyrogallic acid: the image will come out as a positive instead of a negative. If this process prove satisfactory in other hands, it will recommend itself for its extreme simplicity and great facility of execution, which abridges the manipulations in a most remarkable manner.

M. Poitevin, whose name is so favourably known in connection with many ingenious suggestions in photography, particularly with photo-lithography, has lately announced a new collodion process, which has the remarkable feature of suppressing the nitrate bath. He uses an alcoholic collodion, to which he adds four to five per cent. of crystallised nitrate of silver, or about twenty to thirty grains to the ounce of collodion. When the plate is coated with this, pour over it a solution of iodide of potassium of the strength of two or three per cent., to which iodide of silver is added nearly to saturation. The plate is then washed freely and dried. When made ready for the camera, a solution of nitrate of silver is poured over the plate, which, when drained, is put into the slide, and exposed as usual. If this process be found practicable, it will take rank among dry processes. J. P.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

CHECKMATE.

To the Editor.

Sir,—My last communication would be incomplete without taking some notice of the attempt of that party, to whose "good nature" (?) I am, *according to his own account*, so much indebted, to impugn the accuracy of the optical paper which I lately contributed to your Journal. I would first, however, say that, when he assumes that I have endeavoured to produce misapprehension with respect to the motives of his conduct, he assumes that which is not borne out by the facts. In my paper published in your number for March 15th last, I have confined myself as nearly as practicable to a simple statement of facts, which he has not attempted to disprove. If those facts be evidence that, while writing to me that the aplanatic lens had "precisely" the same distortion as the ordinary meniscus, he also wrote to Mr. Wilson, influencing him either to believe, or to continue in believing *the contrary*, and to publish that which he (the editor) knew, or thought he knew, to be incorrect, then has he (the editor), under the cloak of contributing truthful information, been playing false with both Mr. Wilson and his other readers. I believe that the foregoing must stand for *a deduction from facts, and not an endeavour "to produce misapprehension"* on my part.

Now, with respect to his last attack on my optical communications:—1st. He never reads them because they are unreadable. Answer: They have been read and understood by persons of still less mathematical knowledge than myself, and they have been read and approved by persons of far higher mathematical knowledge than necessarily appertains to a junior wrangler.

2nd. He writes:—"Mr. Grubb is now engaged in finding the optical centre of a combination of lenses;—rather a singular occupation considering that *combinations of lenses have no optical centre, and that the definition of that point only applies to a single lens.*" Answer: *That* I have been, or am, so engaged as he here states is exactly the reverse of truth, as my lately published paper fully bears witness. I would here observe that I have put in italics a portion of the foregoing extract from your

* Mr. C W. Day justly observes, in his cheap little work *On the Art of Miniature Painting*, that "in observing the colour of the human face the uneducated eye sees nothing more than the general or local colour, making no nice distinctions between shadows, 'demi-tints,' 'pearl' or 'grey tints:' yet such gradations and varieties do exist; and very much of what is called 'flesh-colour' is composed of purples and greys."

contemporary's essay, though not printed in italics in the original. My reason for so doing will appear by-and-by.

3rd. He extracts a sentence from my late optical paper having reference to the focus for parallel rays, and then writes:—"This is an erroneous statement as applied to any compound." Answer: My statement is not only perfectly correct, but it is consonant with what all *sound* writers on optics who have preceded me have stated, whose deductions are not to be overturned by an *ipse dixit*. But

4th. He attempts a proof of his *ipse dixit* after an old and perfectly illegitimate fashion of his own, viz., by interlarding words of his own, altering my proposition; and not only this, but he goes a step further, and *supplies a centre or point for his own convenience to measure from, which centre he has just before stated does not* (cannot) *exist*. [See the extract from his essay which goes before, and which I have marked in italics.]

5th. He states that if he happen to stumble upon a sentence of one of my optical papers, he is "nearly sure to find some erroneous statement made in it." Answer: This is an insult, aggravated by the circumstance that he made a similar and equally untrue statement some years since, and did not then, nor has he since, with all his assiduity, proved me in error in a single instance.

It is to *his* absurdly erroneous optics (not to mine), and his subsequent pertinacious defence of them, thus compelling me in my own defence to show who was wrong and who was right, that I am (so far as I am aware) solely indebted for his unscrupulous and continued hostility. How far his optics are more instructive now than years ago may be judged by a late sample. In one of his contemptible attempts to write down the aplanatic lens he states that I "facetiously" called it aplanatic. Why? *Because forsooth it is not aplanatic in the reverse position to that in which it is invariably to be used as a view lens!* Even a junior wrangler of Cambridge ought to have known that on the same grounds the aplanatic lens of a telescope is *as "facetiously"* called aplanatic. Does he mean to accuse Sir John Herschel (with whom I believe the term originated) of facetiousness in giving the title "aplanatic" to a lens which is only so in one position? or is he ignorant that no single (and probably no double) combination extant is aplanatic in both positions? Apparently he is, for I think he says so much of one of his own combinations, the aplanaticity of which, though asserted by him, rests merely on his "*ipse dixit*," contravened by another.

Fortunately the course which your contemporary has so long and with increasing perversity pursued ultimately works its own cure, and his (personal) optics must be strangely blinded if he see this not. The private communications which I occasionally receive—some from indifferent parties and entire strangers—show me that, while I need care little for the result of his tirades, he ought. Would that he saw this and studied his own interests better! I speak not as concerning myself alone. His fondness for abusing appears as too great to be lavished on the head of a solitary individual. It is not unfriendly advice to him to ponder his path ere it be too late. He who pursues an unworthy and mischievous course until he is no longer able to follow it, gets not much credit in the end for resigning it.—I am, yours, &c.

THOMAS GRUBB.

SYSTEMATIC INVESTIGATION OF DETAILS OF THE PROCESS OF POSITIVE PRINTING.

To the EDITOR.

SIR,—I had prepared a continuation of my paper on printing for the May meeting of the Manchester Photographic Society, but as the whole of the evening was taken up with matter which was entitled to precedence, I had not the opportunity of reading it. It has been determined to continue the meetings of the Society throughout the year, and I propose to resume the subject next month. I will at once, however, reply to those matters which I appear to have clothed in some ambiguity; but I desire, in the first place, to get rid of any credit to which I may have appeared to lay claim, but which belongs to others. I was aware that MM. Davanne and Girard had made known the results of experiments in photographic printing previously to those now in course of publication, but I had an impression that the inquiry had reference to the composition of the photographic image; at any rate, I had no recollection that they were conducted upon the comparative system that I adopted. I cannot now refer to the articles, but you are no doubt correct; and I at once retract that part of my paper bearing upon this subject.

It appears to me that it is not a matter of any importance whether I used paper or glass negatives; as requiring less trouble, I adopted the former plan, the strips of paper being fastened at each end upon the glass of the printing frame.

The sensitiveness I spoke of was that which enables prepared papers to receive impressions quickly, and had not reference to the ultimate darkening—that part of the subject was reserved; but, as the end in view is to obtain brilliancy and depth of tone, it was in part answered by the second division of the subject.

In reference to a supposed discrepancy between the results of my experiments and those of MM. Davanne and Girard, you will observe that my experiments showed a decrease in sensitiveness, due to the presence of nitric acid, but only in a slight degree; and in that principle we therefore agree. The greater effect, which appears to have been observed by others, may, as you observe, be due to the presence of albumen in the one case and its absence in the other.—I am, yours, &c.,

Manchester, May 8, 1860. WM. TUDOR MABLEY.

[We feel obliged to Mr. Mabley for this communication. We had not the slightest intention of imputing to him any unfounded claim to credit: our remarks were dictated by our estimation of his labours, and we felt convinced that our directing his attention to a simple fact that he had accidentally overlooked would be correctly interpreted by him.

The other points noticed we regard as more interesting than the writer appears to do.—ED.]

CATECHISING.

To the EDITOR.

SIR,—I shall feel much obliged by your answering the undermentioned questions:—

1st. If I am allowed to take photographs of the pictures in the Kensington Museum?

2nd. How long my developing solution will keep good after being mixed?

3rd. Which is the best way to take portraits in a room (it being more convenient than out of doors, as my dark room is at the top of the house)?

4th. What is the best material for a focussing cloth?

5th. Shall I be able to dry the prepared plates, 6×5 (in the Fothergill process) in an oak box 24 in. by 13 in., instead of a cupboard or in the dark room, it being more convenient?

6th. Is the crystal medium detrimental to the nitrate bath?

And, lastly, having purchased a good set of apparatus, I should like to know which process is best to commence with?

Being sorry for troubling you with so many questions at one time, and thanking you for past favours, I am, yours, &c.,

A PERSEVERING AMATEUR.

[1. We should scarcely think it probable.

2. It depends upon its nature, whether kept excluded from the air or not; and also much upon temperature. Use it till it ceases to act.

3. Place the sitter near the window (but not immediately in front of it), and have a white screen to reflect the light on the shaded side, which will otherwise appear offensively dark.

4. Black cotton velvet;—black twill answers very well.

5. Yes; but a tin box is better.

6. No; the crystal medium is simply talc.

7. Wet collodion, which must be mastered before any dry process is likely to give good results in the hands of a novice.—ED.]

DE OMNIBUS REBUS.

To the EDITOR.

SIR,—With your usual kindness please to oblige me with a reply to the following:—

1. How is gelatine (Dr. Norris's process) prepared, and does it require filtering before using?

2. An iodiser for Ramsden's (neg.) collodion, and quantity to collodion?

3. I have eight good negatives developed with iron. I tried to intensify one of them with pyrogallic acid three grains, glacial acetic acid fifteen minims, four ounces water, adding three drops of silver bath to the ounce: the picture is so weak that it will not print at all. Can I intensify them? If so, will you give a formula?

4. I filter my bath every day: on account of a black deposit always in the bath, the plates sensitised in it are covered with it. Do I lose silver by filtering so often?

5. What is the consequence of common tap water for the silver bath? I use a gutta percha bath. As I cannot procure distilled water, does it matter if I boil rain water in an iron tea kettle or saucepan, and filter before using it?

6. How is the honey made for your dry process, and what developer is used? also does the plate require much more exposure than wet plates? will the plates do for lantern slides? are they exposed and developed in the same way as you recommend to J. Cunningham in the Journal for May 1st? and in what number of your Journal shall I find an account of your honey process?

I hope I am not employing too much of your valuable time.

I am, yours, &c.

May 4th, 1860. JOSEPH DAY.

[1. Dissolve eighty grains of transparent gelatine in eighteen ounces of distilled water, to which add two ounces of absolute alcohol. Place the mixture in a bottle in a saucepan of boiling water, and apply the gelatine when warm. Filtration is unnecessary.

2. Most makers sell with their collodion an iodiser which they consider best suited for it. Unless the formula by which a given negative collodion is prepared, or at any rate its characteristics, be known, it is not so easy to say what iodiser would be *best* suited for it. The usual proportion is one of iodiser to three of collodion. Try the following:—

Alcohol	1 ounce.
Iodide of potassium	12 grains.
Iodide of cadmium	8 grains.

3. Your *negatives* cannot be "good" if they are "so weak that they will not print at all." You probably mean *positives*. It is not *always* possible to intensify positives into negatives that will give good prints; experience alone will guide you as to what kind of pictures are adapted for the intensifying process. Proceed thus:—Add a few drops of tincture of iodine to water, until a deep sherry colour is produced; pour this over the plate, and the image will soon become converted into one of iodide of silver, of a light straw colour: wash, and while still wet pour on a weak solution of nitrate of silver (two or three grains to the ounce), *in the daylight;* then in your dark room use your pyrogallic developer.

4. By repeatedly using the same filter, the loss of silver is very immaterial. From what you state your bath solution must be very much out of order.

5. As common tap water is very variable as to its mineral constituents, it should never be employed for the nitrate bath. Distilled water can generally be obtained in country towns, though it is not always to be depended on as *chemically pure;* but as you say you cannot procure it, collect rain in *a perfectly clean* glazed earthen vessel, boil it in a clean tinned vessel, and when cold filter it. This would be better than employing spring or river water, which contains salts that form precipitates with nitrate of silver. *Some* waters, however, produce so slight a deposit on the addition of nitrate of silver, that *on emergency* they might be employed after the following treatment:—Boil, cool, and filter as above; suspend crystals of nitrate of silver, tied up in a piece of muslin, at the surface of the water; stir—a greater or less precipitate will take place; as soon as fresh deposits cease to be formed, remove the remaining undissolved crystals; allow the liquid to stand at rest for some hours; decant the supernatant liquid, or filter. The water is then ready for use. With many waters this would prove rather an extravagant operation.

6. See Vol. II. for 1858, page 89, of this Journal, for the description of our honey process, and your queries pertaining thereto. Any dry plate, exposed under a faint negative, would probably afford views suitable for the magic lantern.—Ed.]

WET OR DRY?

To the Editor.

Sir,—1. Which is best suited for an amateur (both as to convenience and results)—viz., the *wet* or the *dry* process?

2. If the *dry* process should be adopted, which particular system would you recommend as most satisfactory and convenient—viz., the Taupenot, the Fothergill, &c.?

3. Which is most advisable to take—*stereoscopic* or larger views?

4. Will the ordinary portrait lens do for stereoscopic pictures?

I am yours, &c. S. S. L.

[1. Amateurs should always commence by perfecting themselves in the wet process before attempting to succeed with any of the dry methods.

2. The Fothergill process for facility—the Taupenot process if you wish to keep a stock of plates indefinitely.

3. It depends entirely upon your own requirements—stereoscopic to commence with.

4. *A quarter-plate* portrait combination, with a small stop placed between the back and front lenses, is well adapted for taking stereoscopic pictures; but a stereoscopic view lens is better suited for taking stereographs when both very distant and near objects are to be included in the view.—Ed.]

DEVELOPING SOLUTIONS.

To the Editor.

Sir,—After having often, as an amateur, made preparations in photography for a little exercise therein, I have frequently (and how many amateurs have been similarly situated), through business engagements or disappointment in visits from friends or the weather, to throw away my preparations for developing, from their not keeping sufficiently long to be ready when the opportunity for their use did arise.

With a view to aid the keeping of the developing solutions, it has occurred to me that if in each case the chemical which would itself deteriorate, and those in connection with it, were kept in a separate state in solution, to be mixed when about to be used, some loss of chemicals and vexation of temper might be avoided.

I make use of Mr. Hardwich's developer for my negatives; and having the impression that deterioration takes place sooner from the union of the acetate of soda and acetic acid with the other chemicals, I intend preparing the solutions in two separate equal quantities, keeping the acetate of soda and acetic acid with half the quantity of water in one bottle, and the protosulphate of iron in a state of solution with the other half of the water in another bottle.

For the positive developer I use the formula of MM. Davanne and Jouet, and intend keeping the iron and alcohol in solution with one half of the water in one bottle, and the acetic and sulphuric acids in the remaining half of the water in another bottle.

Then for a developing glass I make use of a test tube (according to the size of the plate), and graduate the same by a slip of paper gummed on outside and varnished over, and then whilst the plate is taking its dip, or after exposure, prepare the developing agent by pouring into the tube equal quantities of the two solutions.

Should it be requisite, in order to keep the solution, to apportion the chemicals into three or more separate bottles, then the test tube must be similarly divided.

Perhaps some of your chemical photographic readers will aid the amateurs with their views and advice on the subject, and save them from the labour and expense of *experiments in the dark*.—I am, yours, &c.

London, May 3rd, 1860. J. P. H.

P.S.—I trust the gentlemen whose aid is invoked will give me credit for a little more generous motive in attempting to cling to the skirts of their garments than that which actuated the monkey in obtaining the chesnuts from the fire.

[By the course of proceeding proposed you will not add to the stability of your iron solutions, though you may save some of the acetic acid and alcohol occasionally. You will find a better plan to be in weighing out convenient quantities of the iron salt for use, wrapping each quantity in separate papers, and keeping the same in a wide-mouthed stoppered bottle. When about to use a paper-full, have a small Wedgwood mortar in which you can readily triturate the crystals, and the solution will not occupy above a few minutes; or you can keep the iron ready powdered in your paper, if the bottle be closely stoppered.—Ed.]

ECONOMISING OLD BATHS.

To the Editor.

Sir,—I have a very acid bath, made for Sisson's waxed-paper process, as follows:—

Nitrate of silver	30 grains,
Lemon juice	8 drops,
Acetic acid	½ drachm,
Distilled water	1 ounce,
Iodide of potassium	½ grain,

which I wish to convert into a negative bath, *if possible*. Will you kindly say if this can be done, and how?—I am, yours, &c., D.

[We do not think it feasible to attempt to convert the above bath into a solution for negative collodion work. You may, however, succeed in using it for the paper printing process, if you first evaporate nearly to dryness over hot water to expel the greater part of the acetic acid. Then re-dissolve in exactly half the originalquantity of water, and add first five or six grains of citric acid to the pint, and then the same number of drops of ammonia. Citrate of silver will thus be precipitated, and will carry down the whole of the iodide of silver with it. Filter through blotting-paper, and satisfy yourself by using test paper that the bath still retains a slightly acid reaction.—Ed.]

ANSWERS TO CORRESPONDENTS.

Thankful.—We are very glad you have got over your troubles.

Samuel.—We shall be happy to give our opinion. You may send it if you please.

Something New.—Not in your communication; the idea is "as old as the hills."

S. Jones.—The subject you mention was embodied by Mr. Rejlander, of Wolverhampton.

C. F. (Lincoln).—We cannot perceive in what way your suggestion would be beneficial.

Sarah.—Touch the stain with tincture of iodine, then use cyanide of potassium, and yon will succeed.

R. Allen (Dublin).—See Mr. Dawson's paper in our last, and our leader in this number; you will then have the facts and opinions founded thereon.

Capt. A. N. Scott.—We have forwarded a letter and package, as desired, by mail, on the 4th instant.

James Allen.—We know of no work on the subject in the English language except "Hardwich's Manual."

Viator.—We are now "building" a new camera, constructed especially for rigidity, lightness, and simplicity; when finished, we may describe it.

Optico.—We believe that the compound photographic lens was first *made* by Mons. C. Chevalier, at the time Professor Petzval was *calculating* what its formulæ should be.

J. D. V.—If a subscriber, you can scarcely have been a *reader* of this Journal to ask for information which has been so recently given. Consult Mr. Wall's articles on colouring, and you will find all you wish to know.

A. B.—For replies to your several questions relative to Mr. Barnes's dry processes, we must refer you to a pamphlet published by him on the subject. We are not quite clear as to what his recommendations really are. We believe the pamphlet is to be procured of Messrs. Knight and Son, Foster Lane, Cheapside, London.

A Young Photographer.—Develop with—

Protosulphate of iron	15 grains.
Nitrate of potash	10 ,,
Distilled water	7 drachms.
Alcohol	1 drachm.
Nitric acid	1 drop.

Constant Reader.—Your signature is evidently a misnomer, or you would not inquire where to find information published in the 15th March number for the present year. We are always ready to afford information, but we do not carry an index in our head; and we do not perceive that there is any more trouble for you to look back a few numbers than to write, and virtually ask us to do so for you. Please have a little consideration.

S. F.—We never ridiculed the pictures produced by the panoramic lens, we simply corrected the false statements put forth relative to the *lens*, viz., as to its alleged freedom from causing distortion of the image, perfection of sharpness, &c. Be so good as to refer to our article again. We cannot join you in rejoicing at its shortcomings: we should have been delighted had it been a real advantage. It is, in our opinion, a *clever* failure, as already stated.

Received.—Israel Holdsworth, J. B. Hockin, Horne & Thornthwaite, J. Tyler, Aliquis, and C. D. Will all have attention in due course.

⁂ A large number of articles in type are unavoidably postponed.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 119, Vol. VII.—JUNE 1, 1860.

We would not pay so ill a compliment to our readers as to suppose their devotion to our art capable of being influenced by any such consideration as that of Court patronage; but assuredly they cannot feel otherwise than gratified to learn that Her Majesty and her Royal Consort, who have upon very many occasions publicly expressed, both by word and deed, their more than common interest in the advance of photography, not only continue to manifest proofs of their appreciation of its productions, but to show also that the same increases. Nor is this interest confined to the two most exalted members of the royal household, many, if not most, of the younger branches of Her Majesty's family partaking in the predilection.

Our readers will probably have observed an announcement in the daily papers that, on the 17th ult., Mr. Mayall, of Regent Street, was honoured by a command from Buckingham Palace to attend for the purpose of taking some photographs. Having had occasion to pay Mr. Mayall a visit on the following day, he favoured us with a private view of the negatives taken (upwards of half a hundred in number), as well as a few proofs from them, in an unfinished condition. We need scarcely state that the series is a highly interesting one, embracing as it does the representations of so many illustrious personages; and we can also affirm that the photographer has not only been a very successful operator upon the occasion, but that his artistic skill has been called fully into play, as evinced by the easy and graceful attitudes of his sitters, which add an additional charm to the productions, and testify that the "sittings" have been submitted to *con amore* in every instance.

A few weeks ago, by the courtesy of Messrs. Murray and Heath, we had an opportunity of inspecting the photographic outfit, just then completed by that firm, for H.R.H. Prince Alfred, which was intended to accompany him on his maritime expeditions. The whole of the paraphernalia were arranged in the most systematic manner in several cases, but in such a manner that whatever operation may be in contemplation, all the requisites for that operation in particular are readily separable from those that are not wanted; while the packing is so managed that no time is lost either in the operation of unpacking or of putting away again. This is a very great convenience, though one in which only the favoured few can indulge, in consequence of the additional expense involved from the necessity of having some duplicates amongst the chemicals and apparatus, as well as from the increased bulk.

Amongst the apparatus we would particularly notice a new stereoscopic camera, which is very compact and handy, the lenses, dark slides for a dozen dry plates, focussing screen, &c., all being included within the camera, which, when closed, forms a rectangular box, with lock and key, without any projection whatever. As this is a matter that will interest photographers generally, we will endeavour to describe it concisely.

When placed on the tripod for use, and unlocked, the back of the instrument opens like an old-fashioned pianoforte, so that the back and half of the top lie flat upon the remaining part of the top. The front also opens upwards, being hinged to the top, and when down, acts as a cap or shutter to both lenses at once. By the addition of an india-rubber band attached to a couple of pins, the same is applicable as a contrivance for giving a very short exposure.

A species of open box or deep tray, containing the double and single slides and focussing glass, is lifted out of the space uncovered by opening the back part previously adverted to, the tray being capable of suspension beneath the camera, not loosely, but by means of a tongue and groove of thin metal, so that any desired slide is immediately at hand, in a convenient position. Within the front, which is hinged at top, and at about one inch distant from it, is a second front in which the lenses are inserted; and attached to its opposite side is the working body of the camera, on the bellows principle, which closes up, when not in use, into the space not uncovered either at back or front, and when in operation is simply drawn back, and adjusted for focussing, into the space previously occupied by the tray of slides. It is not quite so light in weight as some we have seen, but is ingeniously constructed and pleasant to use. Amongst the accessory apparatus we must not omit to mention an improved form of pneumatic plate-holder, which is highly effective. We are surprised that any photographer should dispense with the use of such a simple luxury as a good plate-holder,—a luxury which not only conduces to the personal comfort of the operator, but also offers additional security against accidental stains on the plate and injury to the film.

We find from a recent number of a foreign contemporary that the experiments of Mr. C. J. Busk, detailed at page 98 of the current volume of this Journal, have attracted some attention in France, and with the singular pertinacity for which our continental brethren are noted, the phenomena are at once referred to the myth that was designated the "new action of light." It should be borne in mind that it was expressly stated at the time of the supposed discovery that paper "impregnated" with light parted with it if kept in darkness, unless in some hermetically-sealed receptacle; that, however, is a trifle not to be regarded for a moment by our contemporary, and we find the "absorbed light" theory applied to Mr. Busk's experiments in spite of the following passage which we quote verbatim, viz.:—

> "It is *not at all* necessary to expose the engravings or writings or other designs to sun or daylight before placing the prepared papers in contact with them. *A design that has not seen light for years can be taken equally well, and in as short a time.*"

Comment on the above would be simply loss of time.

In our impression of the 1st proximo our friend Mr. Hannaford, in his "Photographic Gossip"—in which, by the way, we regarded him as throwing stones right and left—while his hand was in, cast one at the practice of printing a proof from several negatives, combining portions from each. Had no one else done so we should not have considered it necessary to remark upon the subject; but in the present number we publish a letter (purporting to come from "Mrs. Spriggins," a lady who favoured us with some observations on the use of calomel upon a previous occasion), in which the same "air, with variations," is performed as that executed by Mr. Hannaford. Now we should

much like to know why any odium is sought to be attached to the practice in question? It appears to us perfectly legitimate; for observe there is no question of deception except an admitted and agreeable one—in short, it appears to us just as reasonable to condemn such a piece of ingenuity as it would be to object to a novel because it should bear the semblance of truth. Moreover, we cannot perceive the exact point where the odium (if any there be) could be said to cease. Roger Fenton, Lake Price, Grundy, and a host of others are equally guilty with Rejlander and Robinson; for have they not composed *genre* pieces, *e.g.*, "Turkish Water Carriers," "Bayadères," &c., "Don Quixote," "Robinson Crusoe," &c., "Fishermen," "Turks," *et hoc genus omne?* In what consists the difference between composing a subject and taking it on one plate, and taking portions of the subject on separate plates, and combining them subsequently, except that the latter is the more troublesome method, and, we may add, produces better results?

A LATE case of poisoning by photographic chemicals recorded in our publication of the 1st May, and a knowledge of the occurrence of other somewhat similar cases, has induced one of the members of our editorial staff to draw up a "Table of Antidotes," which will be found in another place, as useful to meet any future emergency.

It is intended to reprint this important Table on cardboard, with convenience attached for hanging up, in order that it may find a permanent place in every photographer's studio and chemical laboratory. Subscribers, Agents, and Booksellers may apply for copies to the Publisher of this Journal.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 5.

It is now a prevalent opinion that almost any substance may be used as a preservative agent in the collodion dry process, provided it be of organic origin, and be nearly neutral to test-paper. That such an idea should be entertained is not at all surprising, when we consider the number of methods which have been published, and from the practice of all of which success more or less constant may be anticipated. Nevertheless, we do not share in the belief that the choice of a preservative substance is a matter of indifference; so far from this, we believe that each substance has its specific reactions, and that much is to be gained by observing them closely. Mr. Macnair has lately read a paper on a dry process in which the plates are preserved by infusion of malt. A discussion followed the paper, and the members appeared almost unanimous in praising the results which had up to that time been produced by the process advocated. We confess to having entertained, in the first instance, an unsatisfactory feeling with reference to the employment of a changeable liquid like "sweet wort" in photography; but, as a friend observed, if it makes good pictures, what matter? A simple preservative method, economical and quickly performed, is likely to be useful, even if the plates could only be guaranteed for one day.

Taking our friend's advice, we stifled our scruples, purchased the malt, and mashed it in due form. That part of the process is simplicity itself. It seems scarcely necessary to weigh the malt; but any convenient quantity may be put into the recipient vessel, and a mixture of two measures of boiling water with one measure of cold water poured upon it, until it is well covered. The temperature of this water, as it flows on to the malt, will be about 160° F., and it immediately falls 15°, so that the thermometer stands about 145°. Doubtless the observation made at the time the paper was read on the importance of observing the proper temperature was correct, for the higher the temperature the larger the proportion of sugar in the wort, whereas at a lower temperature the dextrine is increased in quantity. When the temperature is raised still higher, or nearly to the boiling point, the mixture becomes pasty, and the changes due to the action of the fermenting principle are interfered with.

Infusion of malt is a liquid prone to change. We observed that it ran through the filter, at first nearly colourless, but after standing for a few hours on the table became as dark as sherry wine. The reaction to test paper was acid; in fact rather more strongly acid than we anticipated. The next point to examine was the effect of nitrate of silver upon it; and here we may digress for a moment to observe on the importance of testing any new liquid proposed for employment as a preservative agent, with nitrate of silver, to ascertain whether it throws down an insoluble salt of silver. When Dr. Norris's process was first published we did not meet with that complete success in practising it which we expected; and it is more than probable that our partial failure was due to the presence of chloride of sodium in the gelatine, the effect of which appears to be to weaken the image at every part, unless nitrate of silver be left upon the film in quantity sufficient to convert the salt into chloride of silver. Since then we have invariably adopted the plan of examining the proposed preservative with nitrate of silver and nitric acid; and on doing so with the "sweet wort," a very considerable turbidity was produced. The precipitate darkened in the sun to a brick red colour, and was easily soluble in ammonia, but not soluble in dilute nitric acid. We shall probably not be far wrong in saying that this precipitate consisted principally of a nitrogenous organic substance coagulated by nitrate of silver, and combined with a little chloride and likewise a little phosphate of silver.

With the hope of separating vegetable albumen, or any body of analogous composition, we next added absolute alcohol to a portion of the liquid, the effect of which was to throw down some flaky curds. These collected were found to be perfectly soluble in cold water and to precipitate nitrate of silver white: the inorganic salts went down in combination with the curds, which was precisely what we anticipated. What then, it may be asked, was the curdy matter? Probably it was *diastase*, or diastase mixed with vegetable albumen. Diastase is an unstable nitrogenous principle, present in malt to the extent, as we read, of $\frac{1}{500}$ of its weight; and in the warm aqueous infusion of malt exist also dextrine and sugar, both of which are products of the fermenting action of the diastase upon the starch originally present in the grain. We have never attempted to prepare diastase, and therefore if we were to attempt to describe its properties we should merely quote from books. Another body, however, of an analogous character, viz., "emulsine," is more familiar to us, and of this we proceed to give a short description. If the rough cake of the almond from which the oil has been expressed, be macerated with water, two organic principles are present in the liquid, amygdaline and emulsine. Amygdaline is a complex body soluble in water, but nearly destitute of taste or smell; and emulsine is what we term "a nitrogenous ferment." The molecules of this emulsine in presence of water are in a constant state of change, and by contact with the amygdaline they propagate their motion to the particles of that body, and cause it to split up into oil of bitter almonds, prussic acid, grape sugar, and formic acid.

In order to separate emulsine from its solution in water, highly concentrated alcohol is added; this occasions a flocculent deposit, which is the substance in question combined with a trace of earthy phosphate; the reaction of emulsine to litmus paper is slightly acid. From this description we see that emulsine and diastase are bodies of a similar nature; for just as the former resolves amygdaline into prussic acid and oil of bitter almonds, &c., so does diastase convert starch into dextrine and sugar. When water is absent, however, these changes do not take place; and emulsine, properly dried, may be kept in a bottle for any length of time, retaining its fermenting properties without deterioration.

The diastase contained in one part of malt is sufficient to convert the whole of the starch present in four or five parts of barley into sugar, as distillers are well aware. Thus the addition of barley to the malt in this dry process, may be permitted without destroying its characteristic peculiarity. An infusion of barley alone, however, does not react in the same manner with tests as an infusion of malt; neither could we expect to find in it those products of the conversion of starch which we have before alluded to, since the diastase is not present in the simple grain, but is produced in the grain during the process of germination.

We agree with a speaker who took part in the discussion on Mr. Macnair's paper, that the photographic effect of an infusion of malt could not be imitated by dissolving a given quantity of dextrine and sugar in water (this we suppose him to have meant by saying that he had tried an artificial wort). No doubt the nitrogenous matter present exercises a very decided effect, for these plates appear to develop free from fogging, in the same manner that we find when *serum of milk* is employed. It was thought at first, in the early days of photography, that the sugar of milk was the most important constituent of serum of milk; but this was soon found to be a mistake. The process of coagulating milk by rennet always leaves behind a little caseine dissolved in the liquid, and a trace

of caseine is found to assist in keeping the shadows of the picture clean, and in giving intensity to the blacks. So in like manner we presume that the nitrogenous bodies which precipitate nitrate of silver are useful in the infusion of malt, and that if they were entirely removed there would be a marked difference in the length of time during which the developer would remain clear upon the film. The developer, in fact, would turn muddy rapidly if no nitrogenous bodies were present, and the use of sulphate of iron would be liable to cause stains. Gum arabic we find to be a good preservative, but it does not confer the same property of resisting fogging as the infusion of malt.

In conclusion, we would advise the readers of this Journal to give the malt process a fair trial, and not to suppose for a moment that its publication furnishes an additional proof "that anything will do for a preservative." There are principles present in the sweet wort which are calculated to produce a very decided action in a dry process, and this observation will apply to either of the theories which have been advanced as to the conditions most proper for a dry collodion process.

ON THE APPLICATION OF PHOTOGRAPHY TO SCIENTIFIC PURSUITS.

By the Rev. F. F. Statham, B.A., F.G.S.

[Read at a meeting of the South London Photographic Society, May 17, 1860.]

The rapidity of execution and the accuracy of detail which characterise impressions of objects taken by the aid of photography, might seem to point out this art as one calculated to be of the utmost service to philosophers of all denominations in carrying out their experiments or in recording the results of their researches. But it is only by slow degrees, and as chance has suggested the adaptation of the photographic art to the advancement of various branches of science, that the importance of their correlation has been recognised, or the aid which photography is so capable of rendering been duly appreciated. The object of the present paper is not so much to chronicle the services which have already earned for photography a just title to be regarded as the "*handmaid of the sciences*," as by a brief survey of some of the benefits hitherto conferred to awaken public attention to the wide field of usefulness opened up by the discovery of this invaluable agent, and to suggest one or two additional spheres in which possibly the use of the camera may be hereafter rendered available. To give a just and accurate idea of *all* that photography has done for science would be to write anew the whole history of the art, and for this I have neither the time at my command or the requisite ability to grapple adequately with the task; but I have thought that a few *plain observations* from one warmly devoted to the interests of photography, though not even pretending to a practical acquaintance with the manipulatory branches, might call attention to the subject, and induce other labourers much more competent than myself to work out this scheme in a way which its importance deserves.

And, first of all, for the aid which photography has rendered to *chemical science*. It is true that photography is the child of chemistry; and we might perhaps more justly inquire what have been the services bestowed upon the photographic art by the agency of chemistry, than put the question of the benefits conferred in the opposite way. But I am prepared to maintain that, if a child once, photography has been a grateful child; and now that she has arrived at a state of maturity, she is repaying the advantages received in her condition of pupilage with a most bountiful interest. The practice of photography has so popularised the chemical art as to have called into existence a new generation of chemical students. It has infused a wonderful zeal into the study of this fascinating science, and has caused thousands to read the works of our most established practical or theoretical chemists who would never but for their love of the photographic art have consulted their pages. Add to this, that by necessitating a vast increase in the number of chemicals, it has originated a laboratory of its own; it has called into existence several totally new combinations of matter; and has wonderfully cheapened the cost of production of many of the most useful chemicals and drugs. Depending as it does for success so much upon neatness and skilfulness of operation, photography has gradually taught the young chemist qualities all-essential to the attainment of perfection in his favourite pursuit—*patience*, which will not be defeated by the failure of several experiments; the most scrupulous *cleanliness* in preparing and manipulating his apparatus; *self-reliance*, when by perseverance and industry he has once thoroughly mastered the processes of his art; and a *spirit of inquiry and adventure* which will prompt him to seek out new modifications of matter, or to note with a philosophic eye any unexpected or not easily explainable appearances which may present themselves during the prosecution of his experiments. I apprehend that chemistry, as a science, is only just beginning to reap the fruits which it may hereafter anticipate from the wide diffusion of a taste for photography among the choicest intellects of our land. Just as the alchemists of old, while spending their lives among crucibles and alembics and furnaces in the pursuit of a totally different object, still fell occasionally upon the discovery of some new compound which, after experience, proved to be of the most vital consequence to the advancement of chemical science, so I conceive it to be impossible that so many new labourers can be imported into the wide field of photographic experiment without occasionally picking up, in like manner, some jewel of philosophic worth which may hereafter open new sources of discovery to the chemists of future generations, or establish still more firmly the value and importance of the existing body of chemical truth. Who can deny the probability that we may even now be nurturing some embryo Davy or Liebig among our young and ardent photographers, when he considers how intimate is the connexion between the two classes of truth which are the mutual objects of pursuit of the chemist and the photographer, how each depends on the other for information and aid, and how both are fired by the same glowing ambition to make some new discovery which may be useful to mankind or serviceable to the cause of philosophic progress generally?

I pass on, however, to another branch of science which has derived no inconsiderable aid from the appliances of the photographic art. I mean *geology*. There is perhaps no science which is more indebted to the arts of accurate delineation than the science of geology. To be able to give a just idea to another of any peculiar physical feature—say, for instance, of a landslip, or a section of a coast, or the crater of a volcano, or the aspect of a mountain range—how thoroughly inadequate would all mere verbal description be! We feel at once that a few rude outlines with a pencil, or a roughly-coloured draught taken on the spot, would convey a much more correct impression of such an object or scene than whole pages of printed matter, or oral explanations however lengthy and diffuse. And hence all our standard works on geology are most profusely illustrated, and the amount of artistic skill which is to be witnessed in some of the more costly of them is of itself a source of great attraction. Now, I am not going so far as to assert that, under all circumstances, a photographic view of any scene of geologic interest would possess indubitable advantages over the sketch made by hand and coloured according to the tints observable in the natural landscape. Geologists are the anatomists of nature. They are not blind, it is true, to the grandeur and sublimity of its scenery, but as a rule it does not accord with their especial object to spend much time in the mere act of admiration. They generally want to get at the origin of physical appearances, and hence they are continually on the search for sections of the earth's crust which may reveal the superposition or the relative connexion of beds, or for sea-coast views, or railway cuttings where the internal economy rather than the beauty of the outward surface may be revealed. But still there are dozens of cases in which accuracy of detail is of the utmost consequence to the geologist in order that he may preserve the memory himself or convey correctly to others the results of his discoveries in the dark bowels of the earth; and where on a large scale any striking natural phenomena are to be delineated, it is obvious that the camera must be of the utmost value, if it be only to furnish the outlines of the sketch to be filled up subsequently by separate visits to the individual parts, or to serve as an *aide-mémoire* from which to draw with the graver or pencil an enlarged copy. In many instances, as in the delineation of fossils, or the transcribing of scenes of geologic interest, which would occupy hours and hours of hard labour in mere hand drawing, photography may be rendered most highly instrumental to the cause of geologic science. As examples I place upon the table stereographs of some tertiary fossils, recently found in the tunnelling for the great high level sewer at Dulwich, and views taken in the Scilly Islands a few summers ago of disintegrated granite masses, rock basins, and other scenes possessing an interest to the geologic student. My belief is that a series of well-executed photographs of all the characteristic fossils in our national museum would be of the utmost use in an educational point of view; and that the illustration of works on geology by means of photographic agency would be a vast improvement upon the system now so generally in vogue, where the cost of production renders first-rate illustrations all but impossible except in works produced and sold at a very high price.

(To be continued.)

A TABLE OF ANTIDOTES

TO THE

POISONOUS BODIES USED IN PHOTOGRAPHY,

(DRAWN UP FROM THE MOST RECENT MEDICAL AUTHORITIES,)

BY

SAMUEL HIGHLEY, F.G.S., F.C.S., &c.

LATE LECTURER ON MEDICAL MINERALOGY AT THE SAINT GEORGE'S SCHOOL OF MEDICINE, GROSVENOR PLACE, LONDON.

"PREVENTION IS BETTER THAN CURE."

ALTHOUGH the list of deadly poisons employed in photography make a formidable array, serious consequences through the practice of the art need not be anticipated if due and proper precautions be exercised by its votaries. All chemicals should be kept in a box or cupboard under lock and key, and every bottle should have its contents distinctly labelled. Chemical preparations, solutions, &c., should never be left about the domestic apartments, or on the floor or other places within the reach of children or animals. Jugs, basins, cups, or other utensils in domestic use, should not be employed for photographic purposes, but special vessels be kept apart for laboratory work. Servants and children should be forbidden ever to enter the sanctum of the developing-room or laboratory, or to touch anything contained therein. During the preparation of gun cotton care should be taken not to inhale the fumes. In the event of a bottle of a concentrated acid or ether breaking, the room should be abandoned, and the doors and windows put open till the fumes are dissipated. Chalk should be thrown upon an acid to absorb and neutralise it.

HOW TO ACT IN A CASE OF POISONING.

Send a messenger without a moment's loss of time for the nearest medical man. If the nature of the poison be known, write the name on paper and send it by the messenger. If there be no immediate evidence of the nature of the poison taken, the breath and the containing vessel should be smelt for any characteristic odour. A small lump of whiting or chalk should be dropped on one part of the containing vessel: if effervescence ensues the poison is an acid. A drop or two of vinegar should also be placed on another part of the vessel: if effervescence ensues the poison is an alkaline carbonate. The nature and colour of any spots about the mouth, throat, neck, or hands should be observed. In the absence of any of these signs, the early symptoms should be closely watched, and compared with those given in this Table. In drawing up this Table, all medical terms have been avoided, and the remedies recommended are those usually to be found at hand in the commonest household. In the event of the patient being placed in safety before the arrival of a surgeon, it must be borne in mind that medical supervision is necessary to anticipate any after symptoms that may result.

POISON.	SYMPTOMS.	TREATMENT.
SULPHURIC ACID OR OIL OF VITRIOL. Sp. gr. 1·800—1·845.	Immediate. Violent burning pain from the throat to the stomach and bowels, escape of gaseous and frothy matter, retching and vomiting of a bloody coffee-coloured fluid with shreds of tough mucus, which reddens litmus paper, and effervesces with chalk, whiting, or carbonate of soda. The lips, mouth, and tongue excoriated, shrivelled white, after a time turning grey or brown; the mouth becomes filled with a ropy and sticky accumulation; speaking, swallowing, and breathing very difficult; face then becomes blueish or livid; hiccup; motions, if any, more or less bloody or charred; constant but ineffectual attempts to pass urine; great tenderness of the abdomen increased by any movement; excessive thirst; pain increased by drink; pulse irregular; the skin cold and mottled; clammy sweats; great exhaustion; intellectual faculties clear until the last; convulsions; death in from eighteen to twenty-four hours after the poison has been taken. Death may result from strangulation caused by the swollen and inflamed state of the organs around the entrance to the throat. EXTERNAL INDICATIONS: Brown spots on the skin of the lips, neck, &c.; yellow, red, or brown spots on the clothes.	As the action of corrosive acids on the membranes of the throat is instantaneous, it has always to be feared that the power of swallowing may cease sooner or later. No time should therefore be lost in neutralising the poison that may have reached the stomach, by administering carbonate of magnesia, or solution of carbonate of soda mixed in water, milk, or barley water, a glassful every two minutes; in the absence of these, soap, powdered whiting, or chalk, mixed in water, may be substituted. It may be mentioned that simply milk and gruel given in large quantities has in certain cases arrested the corrosive effects. If strangulation threatens, the surgical operation of tracheometry may alone save life.
THE DILUTE ACID. Sp. gr. 1·420—1·103, &c.	Symptoms less severe and slower in making their appearance, according to the amount of dilution, and their partaking more of the character of an irritant than a corrosive poison.	
NITRIC ACID OR AQUA FORTIS.	Similar to the above, but frequently of a more acute nature; the lining membrane of the mouth and throat becomes after a time of a *citron yellow* colour; teeth white, and the enamel more or less attacked; vomited matter contains *yellow* flakes; body extremely cold; frequent shiverings and rigidity; swallowing causes severe pain; obstinate constipation; stupor; death. ⁂ *Should the patient partially recover,* AFTER CONSEQUENCES *have to be feared.*	
HYDROCHLORIC ACID, OR MURIATIC ACID, OR SPIRIT OF SALT.	Very similar to the above; acrid pungent vapours escape from the mouth in the early stages; the throat is the chief seat of pain; incessant vomiting.	
GLACIAL ACETIC ACID.	Corrosive action on the membranes of mouth, throat, and stomach; pain in the stomach; convulsions; death.	No antidote known, the immediate mischief being on the organ of the throat.
CYANIDE OF POTASSIUM. NOTE!!! ($2\frac{1}{2}$ grains of the pure salt = 1 grain of anhydrous prussic acid, or 15 minims of the acid of the London Pharmacopœia.)	Poisoning by this very dangerous compound of PRUSSIC ACID may arise not merely from it being swallowed in a solid or liquid form, but also by it being absorbed into the body on coming in contact with an abrasion of the skin or a cut. The vapour that arises from this substance is that of PRUSSIC ACID. The symptoms appear and run through their course with extreme rapidity; bitter cold taste, sometimes odour of bitter almonds; constriction and heat in the throat; insensibility; spasmodic respiration; the eyes fixed, pupils dilated and glistening; convulsions; paroxysms of long-continued spasm in the muscles of the jaw and body; sometimes resembling the characteristics of poisoning by strychnia; death. When taken in a concentrated form, its corrosive action may be sufficient to produce death by strangulation.	Bottles containing this body or its solution should be kept closed. When used as a fixing agent the room in which it is employed should be *well ventilated.* From the rapidity with which the symptoms present themselves, there is rarely ever time to employ antidotes. 1. Let the patient inhale the vapour of ammonia, sal volatile, &c. 2. Cold water should immediately be poured from some height in a stream on the naked head, neck, and spine. 3. A weak solution of PROTOSULPHATE OF IRON would decompose the poison, and convert it into Prussian blue. As this is a salt usually to be found in the stock of a photographer, it should be resorted to without a moment's delay. 4. Stimulants should if possible be got into the stomach.

ANTIDOTES TO POISONS USED IN PHOTOGRAPHY.

POISON.	SYMPTOMS.	TREATMENT.
BICHLORIDE OF MERCURY OR CORROSIVE SUBLIMATE.	Generally immediate; *metallic coppery* taste; suffocating sensation and burning heat in the throat, extending downwards; pain in the stomach increased by pressure; nausea; vomiting of stringy *white* mucus, streaked with blood; profuse purging; motions of a *mucous-like* nature, streaked with blood; face, lips, mouth, &c., sometimes swollen and stained white; the tongue white and shrivelled; pulse small, quick, irregular, almost imperceptible as the symptoms progress; skin cold and clammy; breathing difficult; sometimes suppression of urine; cramps; fainting; convulsions; death within twenty-four or thirty-six hours. *** *Salivation as an after symptom has to be anticipated.*	If vomiting does not exist, it must be produced by giving every few minutes a tumbler of warm water in which two teaspoonfuls of mustard have been stirred; then administer white of egg beaten up with water, frequently and in large quantity, to counteract (by decomposition) the effect of the poison. Should eggs not be at hand, flour mixed into a cream with water or milk may be substituted.
NITRATE OF SILVER OR LUNAR CAUSTIC.	Immediate; metallic taste, generally, those of other corrosive poisons; the *whitish* flaky matter vomited darkens on exposure to light. EXTERNAL INDICATIONS: The characteristic brownish black stains of this salt on the skin.	Dissolve a table-spoonful of common salt in a pint of water, administer a wine-glassful every two or three minutes to convert the poison into the inert chloride of silver; then give mucilaginous drinks, and follow up with purgatives.
CHLORIDE OF GOLD.	Acts locally like Nitrate of Silver. No fatal cases yet on record.	No antidote recommended.
AMMONIA AS VAPOUR OR IN SOLUTION.	Immediate; producing a feeling of suffocation, with great heat in the throat, which continues for a long time; inflammation of the throat and lungs may very probably follow; sometimes croup, hence fatal consequences. — If strong, like other corrosive poisons; taste urinous; smell of breath ammoniacal; after a short time the voice becomes reduced to a whisper, with other indications of great debility; vomiting of a large quantity of stringy salivary fluid, streaked with blood; bloody purging. Death may result from the immediate consequences, or from resulting inflammation of the breathing organs.	Immediate remedies:—A draught of cold milk; and same as for Vapour of Nitro Sulphuric Acid. — Vinegar and water, or milk with barley water may be given, if the power of swallowing should not have been destroyed. Prompt medical aid.
MURIATE OF AMMONIA OR SAL AMMONIAC.	Excessive vomiting, convulsions, and general stiffness of the muscles; great pain in the bowels; early alteration of features; death.	No antidote known; vomiting to be assisted by large draughts of warm sugared water, or if not successful, to be induced by tickling the back of the gullet with a feather or the finger. The after nervous and inflammatory symptoms must be treated by anodynes, anti-spasmodics, &c., under proper medical guidance.
POTASH AND SODA, CAUSTIC OR CARBONATED.	During the act of swallowing, an acrid, caustic taste; if taken in a concentrated form the membranes are softened and corroded; sensation of burning heat in the throat, extending downwards to the pit of the stomach; *if* vomiting occurs, portions of the lining membrane may present themselves, and streaks of dark brown coloured blood; the vomit effervesces with vinegar or other acid, if the carbonates have been taken; the skin cold and clammy; purging; pain in the stomach; pulse quick and feeble; after a short time the lips, tongue, and throat become soft, red, and swollen; convulsions; death.	Give vinegar and water, or lemon or orange juice freely, to neutralise the alkali, or give oil in large doses for the purpose of converting the alkali into soap, and to induce vomiting. Afterwards give milk, gruel, or barley water to dilute any alkaline matter in the stomach or bowels.
NITRATE OF POTASH, OR NITRE, OR SALTPETRE.	Nausea; painful vomiting; purgings; convulsions; faintness; pulse weak; breathing laborious; limbs cold; tearing pains in the stomach and bowels; a kind of intoxication; speedy death.	Give an emetic of two teaspoonfuls of mustard, dissolved in a tumbler of warm water. Afterwards large draughts of new milk with egg beaten up in it, or linseed tea.
BICHROMATE OF POTASH.	Pain; vomiting; dilated and fixed pupils; cramps in the legs; and insensibility.	An emetic of mustard in warm water, and afterwards the administration of whiting or powdered chalk, mixed up to a cream with water.
CHLORIDE OF BARIUM.	Nausea; vomiting of watery mucus; twitchings of the muscles of the face; convulsive motions of the hands and feet; distressing pains in the bowels; hiccup; violent convulsions; death generally within a very short period after the poison has been taken.	A weak solution of Epsom salts should be given plentifully to produce vomiting, and also to neutralise the poison by converting it into an insoluble sulphate.
SULPHATE OF IRON.	In very large doses may produce serious and even fatal effects.	An emetic of mustard in warm water, frequently administered.
TARTARIC ACID.	Has been known to act as an irritant poison when taken to the extent of one ounce in water. Immediate; violent burning sensation in the throat and stomach; continued vomiting; death within nine days.	Whiting or powdered chalk mixed to a cream with water should be freely and quickly administered. Warm water may *afterwards* be given to assist the efforts to vomit.
THE FUMES OF NITRO-SULPHURIC ACID.	The fumes that arise in the preparation of gun cotton if inhaled produce violent irritation and inflammation in the breathing organs; in one case on record to an extent that proved fatal.	Prompt medical aid; in the meantime inhalation of steam through a cone of paper placed tightly over a basin containing water just off the boil; and the application over the external surface of the throat and upper part of the chest of thin mustard paste, spread in muslin or a thin handkerchief. The irritation of the throat will also be alleviated by *frequently sipping* the following:—Grate six large lumps of sugar on a fresh rough rinded lemon, so as to extract *the oil* of the lemon; dissolve the sugar in a tumbler of water; add ten drops of *dilute* nitric acid; stir; after a yellow scum has formed strain through muslin, and it is ready for use.
BROMINE.	In the liquid form that of a corrosive poison; in the vapour form state that of an irritant, affecting the breathing organs.	Same as for fumes of Nitro-Sulphuric Acid.
FLUORIC ACID.	The same as Bromine.	
VAPOUR OF ETHER OR CHLOROFORM.	Produces lethargy and loss of sensation; the breathing becomes slow, deep, and noisy; the skin pale and cold; the face livid, and the lips dark blue; the eyes glassy, the pupils fixed and dilated, but sensitive to light; the muscles flabby and relaxed; when the pulse slackens, the temperature of the body rapidly falls, and there is frothing at the mouth immediate fatal consequences are to be anticipated. Where disease of the brain or heart exists death may occur very suddenly.	The face and neck should be exposed to a free current of air, and cold water dashed upon the skin. In an early stage, hot bottles to the feet, and brandy and water or other stimulants given internally, may be of service, but in an advanced stage prove inert. The main chance is by keeping up respiration by artificial means, which is thus performed:—One person must press steadily downwards with both hands the breast bone towards the back, whilst another with hands outspread at the same moment presses the surface of the belly upwards, towards the direction of the lungs; this presses the bowels against the cavity that contains the lungs, and thus expels *the poisoned air*; then let both persons at the same moment steadily release the pressure; a fresh supply of air will rush in to the lungs. Repeat this continuously at the rate at which a healthy person breathes.
PURE ALCOHOL.	Insensibility; breath smells of spirit; breathing loud and difficult; face swollen, and of a bluish red colour, with apoplexy or paralysis of one side. If the pupils of the eyes are dilated and fixed, recovery rarely takes place.	An emetic of mustard, or better, half-drachm or quarter of a teaspoonful of sulphate of zinc in a wine glass of warm water, and repeated in a quarter of an hour. Cold cloths and air to the head, warm bottles to the feet, with friction of the legs; medical aid, as bleeding may save life.

NEGATIVE VARNISH.

We received, some time since, from Mr. King, of Bath, a sample of varnish for negatives on glass, with a request that we would try the same and report upon it. It is only recently that we have found opportunity to make use of it, but it is somewhat difficult to come to any definite conclusion with regard to the value of such a material until after some considerable lapse of time, so that the effects of heat and cold, friction, pressure, &c., may become apparent: all we are able at present therefore to state is, that this varnish flows readily, has a considerable amount of "body," and hardens sufficiently without being "tacky" on the one hand or brittle on the other (that is during our short experience). Personally, we prefer a varnish that does not require the plate to be heated, as in performing the operation of coating it with varnish, under such circumstances, there are the two evils very troublesome to avoid, namely, "chilling" and consequent semi-opacity if the temperature be too low, and "ridges" if it be too high, especially in parts only of the plate.

We think it right, however, to observe that for professionals and others who require to take off many impressions from any one negative, it is hardly safe to employ any varnish that will work without heat, as otherwise, with the exception of that made of amber in chloroform, which is generally deficient in body, we have never met with one that hardens sufficiently to bear the requisite amount of comparatively rough usage to which a plate constantly in the pressure frame is naturally subjected. Indeed, we have upon more occasions than one seen the greater part of the film ripped off the plate on attempting to remove the printing paper from a negative which was supposed to be *protected* by varnish; the accident having in each case occurred when the frame had been exposed to the direct rays of the sun, and the resinous matter had thereby become softened—the varnish having also been applied without heat.

We think the varnish before us promises well for stability, and that it is certainly as good at least as most other kinds in the market.

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

(Continued from page 132.)

IV. ON THE ACTION EXERCISED BY THE PROOF ON THE FIXING SOLUTION.

This part of our inquiry, the chief object of which is to ascertain the causes that bring about alterations in the baths, seem, at the first glance, to present serious difficulties; but the researches given above greatly simplify the phenomena we are about to study.

Having entirely abandoned cyanide of potassium, there now only remains to be examined—with reference to the alterations in the baths—ammonia and hyposulphite of soda. Now, the first of these presents no difficulty; as for the second, the facts previously ascertained render the inquiry easy.

First, as to ammonia. This re-agent shows no chemical decomposition, even after it has been used to fix a large number of proofs: a simple solution of salts of silver in ammonia has taken place,—salts of silver which the bath retains when it ceases to be in contact with the proofs. But this solution cannot be indefinite, it has its limits. Commercial solution of ammonia dissolves about nine and a-half drachms of chloride of silver to the quart; but the quantity of chloride dissolved must, of course, depend entirely on the strength of the solution, upon its richness in alkali. Therefore when the ammonia solution is saturated with chloride it is no longer safe to use it; for if a proof is immersed in it when so saturated, the *nitrate* of silver will be dissolved, but the *chloride* will not, therefore the fixing will be incomplete. Again, if the bath be not exactly saturated, is yet nearly so, it may become so even while the proof is in it, in consequence of the evaporation of the ammonia, and, consequently, incapable of dissolving the chloride. This salt will, therefore, be deposited upon the proof, and also in the body of the paper: subsequent washings will not remove it, and when the proof is exposed to the light, it will blacken all over. Thus it is that ammonia, besides the objection to its pungent odour, and the action it exercises upon the sizing of the paper, is also objectionable on other grounds. Ammoniacal baths become *old* as well as those of hyposulphite: they are, it is true, free from the objection of sulphurisation, but are open to that of depositing chloride of silver upon the whites of the proofs.

It is possible, however, to avoid these inconveniences by determining, on the one hand, the exact quantities of nitrate and chloride of silver solutions, ammonia, of given strength, will dissolve: and on the other, by never leaving a proof long enough in the bath for evaporation to produce a deposit of chloride upon it. Thus, with ammonia as with hyposulphite of soda, we must previously ascertain to what extent a fixing bath can be employed, or, in other words, how many proofs it is capable of fixing.

With regard to hyposulphite of soda, the influence the proofs exercise upon it is easily ascertained. Whether we put into it nitrate or chloride of silver, the action is always the same: the double hyposulphite of soda and silver is formed, which is dissolved in excess of hyposulphite.

$$(Ag\,O,\ S^2\,O^2)\quad (Na\,O,\ S^2\,O^2)\,2$$

The saturating point varies with the strength of the hypo. bath, and can be readily ascertained; but it is very quickly reached in all cases. It is upon this point, solely, that the alteration in the fixing bath depends. For until it is reached, the bath will be unchangeable. It will keep, as experience has proved to us, for many months; but immediately it becomes saturated (with the double salt) it must be considered as old. It will still fix proofs, it is true, but they will inevitably change: it deposits sulphide of silver either on the proof or upon the bottom of the dish containing it, and must, therefore, be entirely rejected. This deposit is accelerated by the action of light, as experiment has proved; for upon taking two portions of the same bath, slightly supersaturated with the double salt, and placing the one in a dark place, and the other exposed to light, the latter altered much more rapidly than the former. Exposing a bath in a wide shallow dish, acts in the same manner; and we incur further risk of alteration in the baths by employing the ordinary photographic dishes.

When a solution of hyposulphite of soda has arrived at this state of continuous decomposition, it should not be filtered, but thrown away; for after filtration the decomposition continues as before, and sulphide of silver is deposited anew. By adding fresh crystals of hypo. to the bath we can, it is true, communicate to it a greater capacity for saturation. In this case, however, the hyposulphite does not dissolve the sulphide of silver, as some writers erroneously assert, but it becomes capable of dissolving a larger quantity of the double salt, and, consequently, of fixing more proofs.

But we do not recommend this practice, for it involves uncertainty. It is better to operate systematically, taking a solution of hyposulphite of soda of certain strength, and fix in it a given number of proofs, determined by experience, according to the strength of the bath; and such a number, moreover, that the bath must be considered as useless, *even before* it has reached the point at which it becomes saturated with the double salt of silver and soda, the point at which it must be considered as *old*, and when it will, inevitably, alter the proof. It is the determination of this point that will next engage our attention.

ON THE SOLAR SPECTRUM IN ITS RELATION TO PHOTOGRAPHY.

[Read at a meeting of the Blackheath Photographic Society, May 21, 1860.]

By T. R. Wheeler.

With the double view of occupying a portion of this evening, when nothing of more importance presented itself, and offering a short *resumé* to such members as have not had an opportunity of reading the very interesting report of Professor Roscoe, of the experiments made by him and M. Bunsen on the relative actinic power of light in various portions of the world, presented to the Royal Society, I have taken the solar spectrum for a test; and if I do not pretend to bring forward anything original on the subject, I trust that I shall succeed in arresting your attention while I place in correlative order some of the phenomena of that most important imponderable agent—light. We call it an imponderable agent, and so it is, for it exerts an influence in common with heat and electricity without adding to the weight or bulk of the substance acted upon; and we judge of its nature and amount by the *force* which it is capable of exerting, rather than by its tangible presence. The question, therefore, "What is light?" is one more readily asked than answered; and I shall not occupy time in discussing either the corpuscular or undulatory theory, or speak further during this short treatise of many of the phenomena of light, which are so far foreign to my present object, viz., reflection, refraction, polarity, epipolic dispersion.

> "From matter streaming, it makes matter bright;
> Matter arrests it on its onward flight;
> And so, I fancy, 'twill but have its day,
> And when that matter endeth, fade away."—*Faust.*

The investigation of the imponderable agents is attended with considerable difficulty, it being often hard to separate abstract from concrete, force from matter. If the speculations of MM.

Grove and Seguin be correct, there are only two things in nature, matter and motion—the former an "entity," the latter a "state."

The facts associated with the action of the imponderable agents come under that class called in natural philosophy "ultimate"—that is, which resist analysis, and are rather subjects for speculation than perfect comprehension, whose *effects* only we observe, and are but rarely able to refer to a *proximate* origin, while their *primary* causes will probably for ever remain with their great Originator.

In nature, however, analogy seems t obe a leading principle, nothing existing as it were isolated, and no abrupt transition being found to exist. On this account Grove has framed his theory of a "homogenesis or correlation of physic a lforce."

In this sense we conceive light, heat, and electricity to be cognate powers, one being convertible into the other by any circumstance which is capable of changing their *states*. But this change always takes place in definite proportions, and the quantity of one force expended is in direct relation to the quantity of the force generated.

A ray of light impinging upon a daguerreotype plate forming part of a galvanic circuit to which a galvanometer is affixed, sensibly affects it, and at the same time occasions a change of temperature indicated by a thermometer. The change which light causes upon any sensitive surface is believed to be in its molecular arrangement.

Hence it appears to me that a close analogy exists between the molecular action of the light and what is called "catalytic action" in chemistry, the latter being an impulse communicated by the molecules of a body in motion to those of a body in a state of rest, inducing a change in the latter without the motive body itself undergoing change. A familiar instance is known in fermentation; the presence of spongy platinum causes the chemical combination of hydrogen and oxygen gases with explosion; and, not to multiply examples, several instances of a similar nature are known to chemists.

The allotropic condition of certain chemical substances occasioned by heat, and which can only be explained by the supposition of an alteration in their molecular states, is another striking point of analogy between light and heat. Electricity being sometimes an effect, and sometimes a cause of both.

Having premised this, I proceed to the consideration of the proper matter of my discourse.

It is familiar to knowledge that several portions of the prismatic spectrum, however produced, possess different physical characters, or, to speak more plainly, exert different physical actions; and it is equally well known that the red, the least refrangible, the most slowly vibrating rays, are those which contain, so to speak, the heat principle, or which, exerting a distinct influence upon thermometric variations, modify our climate, and are the proximate causes affecting the fall of rain and the current of winds, while the most refrangible and rapidly vibrating rays, those near the violet end of the spectrum, are chiefly concerned in chemical agency, and though, not in truth, the most highly illuminating, have, nevertheless, the most intimate relation with the photographer, inasmuch as by their influence those changes are effected on which his art depends.

The importance of the subject will be readily conceded; so great an interest has been attached to it by philosophers that a serious question has arisen among them whether the chemical rays were not a fourth imponderable agent, and the heat ray a fifth. A considerable portion of the *Philosophical Magazine* for the years 1843-4 will be found to be devoted to this discussion; and Professor Draper, of New York, designated the chemical ray "tithonicity," and our own countryman, R. Hunt, "energia"—the latter a purely abstract, the former a purely fanciful term, neither of which have, I believe, been permanently received by the scientific world, or the category of imponderable agents extended to meet these theories.

To measure the amount and variations of these particular rays has always been a great desideratum with the philosophers, and *a fortiori* with the photographer, and hence from time to time various actinometers have been proposed; and if, as Dr. Roscoe has well observed, any instrument could be invented to be worked on the principle which renders the thermometer so valuable, and which has been termed the first law of Planiotte, viz., that the expansion of the volume of mercury is equal with equal increments of heat, then a perfect actinometer would be presented to the public. To find such an arrangement, and to apply it to investigating the amount of chemical light in the ray in different parts of the world, was the object which MM. Bunsen and Roscoe proposed to themselves; and I shall confine myself for the present to a description taken from Dr. Roscoe's report of the mode by which they carried it into effect.

I have before stated that various photometers had been proposed, the principle of which was somewhat similar; but the exposure of certain chemical compounds to the action of light are such that either a re-arrangement of their constituents should take place under its influence, or actual decomposition with the extrication of some gaseous product, the amount of which being calculated afforded an approximate conclusion as to the power exerted by the light. I shall first mention that of Sir John Herschel in 1840, or more properly, perhaps, that of Mr. Jordan, in 1839. These were simply sheets of photographic paper wound round a cylinder, inclosed in another cylinder, which was moved on its own axis at a definite rate by means of clock-work. The light being admitted through vertical slits in the outer cylinder, impinged upon the sensitive surface, and by adjusting the rapidity of its movements so as to keep the slit always opposite the sun, the paper recorded every variation in its light. It may not be superfluous to state that the arrangement did not differ materially from that at present in operation at the Royal Observatory for registering the diurnal variation in the magnet by artificial light, under the able superintendence of our friend the late president.

Mr. Hunt next produced an instrument which he termed an actinograph, of a somewhat more complicated nature, but upon the same principle. Professor Draper, of New York, has, perhaps, devoted more time and attention to the question than any other philosopher. Commencing with the action of light upon surfaces of the chloride and bromide of silver, he suggested an instrument to which he gave the name of a tithonometer, from "tithonicity," the title he invented for the chemical ray. This consisted of a mixture of hydrogen and chlorine in equal parts, which being exposed to light were known to combine to form hydrochloric acid with such energy as sometimes to cause explosion. Other actinometers have been proposed, but this presents the special interest of being the one chosen by MM. Bunsen and Roscoe, with some modifications which appear to be approved by Professor Draper for their extended experiments.

(To be continued.)

A FEW REMARKS ON AMATEUR PHOTOGRAPHY.

By F. Howard.

[Read at a Meeting of the South London Photographic Society, April 19, 1860.]

(Concluded from page 132.)

But to return. If the amateur is determined to produce pictures, not having the time for experiments but when a holiday can be got, let him ramble away with the camera. I know nothing more likely to conduce to health and the enjoyment of nature than outdoor photography—looking out for nature's most smiling features. It is astonishing how far you can walk, and what a weight you can carry, and how much more you see, when out with the camera than under ordinary circumstances. If, in addition, you bring home some good pictures, you will think it one of the best holidays you ever spent, and will wish for another. But you must not imagine from my enthusiastic picture that there are no such things as failures and misfortunes, which the amateur must expect to meet. I have myself walked about day after day, prepared and carried dozens and dozens of dry plates, with no results worth keeping, till almost disheartened; but I think I can say that success was much sweeter when, at last, I managed to obtain a tolerable picture. I will now offer a few remarks on what I consider the best method of practising photography by an amateur.

After well studying the art, having lessons from a proficient, and ascertaining the why and wherefore for using the various chemicals, solutions, &c., apparatus and chemicals should be purchased of good quality, to ensure subsequent success; and, though the results may soon begin to give satisfaction, I would advise a continued practice in copying prints, objects of still life, &c., as it is a very difficult thing to get a good negative, and likewise very difficult at first to distinguish a good one when you have got it. The same remarks apply to printing, which likewise requires great practice, otherwise, when you have got a good negative, you will not know what to do to get the best print from it. Portraiture, which amateurs are very fond of indulging in when commencing, I would recommend to be deferred for many reasons. In the first place, it is about the most difficult of all the photographic branches: it is that branch which is open to, and receives, the greatest amount of criticism. You have to deal with many more obstacles than in landscape photography, and it will tax your patience and ability to

the utmost: it is from this cause alone that so many have been induced to give up the prosecution of the art, they having commenced too early to portray their friends and acquaintances; and, perhaps, what may be called good-natured remarks of admiration at the first efforts do as much mischief as anything. As flattering likenesses are unknown in photography, the poor amateur gets flattered instead, hence a fruitful source of trouble: his eyes are shut to the faults and errors for correction; and, if he unfortunately has no acquaintance or friend, who is a photographer, to show him his faults and help him over these pitfalls, he will get into difficulties, and possibly give it up. He may attempt to take the portrait of a friend, and being satisfied with what he will very likely find out hereafter is a very bad negative or positive, may prevent a better representation being taken of him: the friend may die, or leave the country, and the unfortunate amateur finds himself in possession of a bad photograph as the sole representation of his friend, without the possibility of repairing his fault; therefore, what was intended to have been a great source of pleasure becomes one of pain. Again, the attempt to take a likeness by an amateur is generally attended, at the outset, with so many difficulties that success is very doubtful, unless he have a glass-house and plenty of time, which few amateurs possess. He will have to find out the best position, arrange his background, and if the operating-room is far from the yard or garden where he has placed his sitter, the necessary running backwards and forwards will not in any way compose his nerves or steady his hands; nothing, perhaps, has been used for a fortnight or so; there is apparatus to dust, solutions to mix, collodion to test as to exposure, glass to clean, measures and funnels to wash, and if anything goes wrong (and it is a wonder if it do not), he gets annoyed, and not having had experience enough to imagine where the fault can be, he gets perplexed, perhaps wonders if he ever shall succeed, and ultimately satisfies himself with a very indifferent production for want of a better. If you were to ask a professional to undertake the task, under these circumstances, he would hesitate a long time I am sure. All I can say to amateurs is, don't do it. If you feel yourself able to produce a good negative make a rule of getting ready some hours before: much waste of material and much annoyance will be spared you.

I would myself recommend amateurs, as a rule, to confine their attention to landscape and architectural photography, either stereoscopic or larger, as it pleases them; though I would recommend stereoscopic, as, in addition to the greater facilities with which the views can be taken, they are, as a rule, more attractive to friends, and, if desired, can be enlarged from at leisure for the portfolio. As to wet or dry processes, I will not enter into a controversy about their merits, either as to results or convenience: if wet, you must make up your mind to carry a great deal more baggage, and put up with some additional expense in the way of assistance when out; if dry, you must work well and perseveringly at home before you venture to go far, to ascertain the right exposure, and to learn how to treat your plates under development, as a failure is not to be replaced under the penalty of going over the same ground again. Gentlemen practising, or thinking about practising, the dry processes, would do well to see the results arrived at by Messrs. Bourne, Mudd, and others, at the Society's Exhibition this year. It has been said that a photographer should be able to produce pictures by any process; but to that idea I do not subscribe, as I think to command success, having satisfied yourself that the particular process you are about to follow will give good results, you should follow that process and no other: do not be led away by the promised results of others.

From what has come under my own observation the dry processes are much used by amateurs, as gentlemen may see by specimens which I submit for their inspection as amateur productions; and I do not wonder at it, as a process which admits of being followed at leisure, and is so readily available when an opportunity arrives, is essentially the amateur's boon—it is the greatest incentive to follow the pursuit. I for one think that there would not be one-half the amateur photographers if it were not for the dry processes. I doubt not but some manufacturers of photographic apparatus will bear me out in this assertion.

I cannot finish these remarks without drawing the attention of amateurs, who may regret the want of time, to how much may be done for about four months in the year in early morning; much time may be got for practising; and from May to August operations may well be commenced by five o'clock in the morning—indeed, in or near London, it is much the best time, as the atmosphere is then much clearer than in the middle of the day. Cleanliness is most important: using, as we do, vessels and apparatus at intervals, one is apt to forget what was last in them, and I would advise making sure by well washing before using. Never make shift with common in place of distilled water for developers, nor use stale solutions, &c.

This subject admits of a great deal being said upon it; and if a discussion may ensue, the offer of these few remarks will give me greater pleasure than I anticipated.

ON VARIOUS KINDS OF GLASS, WITH REFERENCE TO THEIR APPLICATION TO PHOTOGRAPHIC PURPOSES.

By J. A. Forrest.

(Concluded from page 113.)

By far the most important branch in glass making, in connection with photography, is that of sheet glass. It is blown into the form of elongated cylinders, which are split and unrolled into flat rectangular sheets, the rounded ends being previously cut off. Having already described the process of crown glass making in a technical manner, I will not task the general reader with any further description of a similar kind, but at once proceed to give the component parts of glass, and show their bearing in the uses of photography.

The ordinary sand used in glass making contains traces of iron, which gives a green tint to the glass. To correct this evil the manufacturer uses small portions of manganese and arsenic; but for photographic purposes, especially for roof glass, the introduction of these articles are ruinous—the former becoming, through exposure to the light, of a strong pink colour, and the latter a yellow, both thoroughly opposed to the transmission of actinic rays. A blue tint of a slight degree favours the transmission of the chemical ray, and, as far as my experience goes, a glass so prepared with cobalt is perfectly permanent. I judge from pieces that have been exposed for centuries in cathedral windows, and have always found the exposed and unexposed pieces to be exactly similar in tint. There is another advantage in the use of blue tinted glass: it allows the sitter to be posed in a strong light without his feeling the light irksome to his eyes.

The following is a selection of the mixtures of glass now in use:—

CROWN GLASS.

Silica (sand)	64·
Soda	22·
Lime	12·5
Manganese	1·5
	100

SHEET GLASS.

Silica (sand)	63·5
Soda	22·5
Lime	14·
	100

When sheet glass is made especially for patent plate the mixture is usually—

Silica (sand)	73·
Potash	6·6
Soda	10·
Lead Oxide	6·4
Lime	4·
	100

Sheet glass, manufactured for patent plate, is first reflattened, then obscured, and afterwards smoothed, preparatory to being placed upon the benches for the polishing of the same. The glass must lose its fire skin, and consequently becomes porous; hence it should be kept in a dry place, with white paper between each plate. Never use printed matter for this purpose, for the impression is almost certain to appear on developing the plate when sensitised and exposed. To clean glass of this kind, take a piece of fustian and nail it upon a flat piece of wood as tightly as possible, saturating its surface with rouge and water, and rubbing the glass upon the same, taking care to wash it thoroughly.

These observations hold good in reference also to purple plate and colourless patent plate, which undergo the same process. Too great care cannot be taken to see that it is perfectly dry after washing, otherwise the artificial lustre will be seriously injured. Purple sheet is made with manganese, and is used for glass positives, giving a backing of an agreeable tone without the use of black varnish. Some experience is required to know how to develop a picture upon this glass. It is much more extensively

used in the United States than in this country; and this is remarkable, seeing the facility and despatch that is gained by its use. Opal glass is admirably adapted for printing transparencies upon, and no doubt will be brought into great request by M. Joubert's burnt-in process.

ON THE MEASUREMENT OF THE CHEMICAL ACTION OF THE SOLAR RAYS.*

By Professor H. E. Roscoe.

(Concluded from page 97.)

The method by which the measurement of the chemical action of the solar rays is determined is, to allow a very small but known portion of direct solar light to fall upon the instrument through a little hole in a metal plate placed in the shutter that darkens the room. The sun's rays are reflected by a *heliostat*, the mirror of which moves with the sun, so that the reflected ray always remains the same. The sun's rays, thus reflected by the mirror, are allowed to fall upon the instrument, and combination of the gases takes place.

Some observations were made on the 15th Sept., 1858, during a cloudless sky, the direct sunlight being affected only by its passage through the atmosphere. They were begun at nine minutes past seven in the morning. When the sun's distance from the zenith was 76°30', the action observed in one minute was 1·52. From that time it kept on increasing, until at fourteen minutes past nine, the last minute of observation, in consequence of the appearance of clouds in the sky, the action observed was 18·51, thirteen times greater than at nine minutes past seven. The sun's zenith distance had become less, his height above the horizon was greater, and the chemical action of the solar rays had increased, which is to be entirely attributed to the fact, that the solar light in passing through the atmosphere is to a certain extent extinguished, absorbed, lost as light. Therefore the thicker the column of air through which the light has to pass, the greater the absorption or loss of light must be. When the sun is low in the heavens, the length of the column of air through which the rays have to pass is greater than when the sun is on the meridian. This, then, is the sole cause of the rise in the chemical action. The morning and evening shadows are not so intense as those of noon-day. We cannot put the instrument into the sun's light, for then it would explode; we must therefore calculate the ratio between the little hole in the shutter and full light.

When we know the amount of action the sun produces at a given height it is possible to calculate the action it would give at any other height, if we know the latitude of the place. The amount of chemical action effected at the earth's surface on a cloudless day by the direct solar rays depends solely upon the sun's zenith distance, and upon the thickness of the column of air through which the rays have to pass.

Now, if we know the law which regulates the absorption of the sun's rays in the atmosphere, we can calculate what the amount would be, supposing the sun's rays arrived at the earth perpendicularly through the air. We find that the loss is about two-thirds; we really receive only one-third. If the sun's rays were not weakened by their passage through the atmosphere they would produce an illumination represented by 318 degrees of light; or they would effect a combination, in one minute, on a surface upon which they fell perpendicularly, of a column of hydrochloric acid 35·3 metres in height. The sun's rays having passed perpendicularly through the atmosphere to the sea level, effect an action of only 14·4 light metres, or nearly two-thirds of their chemical activity is lost by dispersion and extinction in the atmosphere.

From these, and many other interesting results, we may calculate the amount of chemical action which the sun's direct rays produce at any place, when we know the latitude and the thickness of the air through which the sun's rays pass. The activity increases as we approach the equatorial regions. The mode of measurement described is not one that can be universally adopted. The instrument is too complicated for every day use. In the hands of an experienced person, this photometer is a valuable instrument; but it requires special treatment during at least a week before it is fit to be used, and even then a moment's inattention may spoil it; and when it is to be used in the morning, the instrument requires constant watching and attention during the whole of the previous night.

At present we know of no easy and, at the same time, accurate mode of measuring the action of light. Much time and labour have already been expended by the inventors of this apparatus in endeavouring to prepare an accurate instrument that shall be capable of being used with facility, and it is to be hoped that their efforts will be crowned with success.

* Condensed from a Lecture delivered at the Royal Institution, on the 2nd March.

Exhibition.

PHOTOGRAPHIC EXHIBITION AT SALFORD.

[FROM OUR SPECIAL CORRESPONDENT.]

We are glad to find here another instance of the gradual way in which our favourite science is taking its place among the arts called fine. The Committee of the Peel Park Museum, in making arrangements for their annual summer exhibition, to which Her Majesty is a contributor, determined to devote the wall space of one room to the display of photographs, the produce of local photographers—all pictures to be untouched. This is a move in the right direction, and an exposition is secured of pure photography, without instituting undue comparison with the works of continental or other distant artists, a comparison which, however, many of the works exhibited would well sustain. But the Committee have gone further and done still better than this, they have secured the willing services of the Manchester Society, whose exhibition committee have undertaken the superintendence of this part of the exhibition, and have discharged their duties in a way which we are sure will give general satisfaction.

The centre of a room in the new wing of the Museum is occupied by a bedstead of silver, of valuable but barbarous workmanship, which, from being the chattel of some eastern potentate, has become the property of Her Majesty, who lends it to this exhibition. Its cumbrous velvet canopy deprives us of some light, but not to any serious extent. There is also beneath its canopy the cradle made in 1814 for the expected deliverer of Israel, of whom the credulous followers of Mrs. Southcote were in eager expectation.

We feel ourselves in some difficulty in treating of this exhibition: the display is so uniformly good, so neatly arranged, and the subjects so varied, as to preclude our using almost any other than words of admiration.

There is as yet no catalogue printed, and we have taken the trouble to make one for ourselves; and when we find in it some thirteen pictures by Mr. Mudd, the same number each by Mr. Wardley, Mr. Mabley, and Mr. Higgins, and a dozen from Mr. Mann, the zealous Secretary of the Manchester Society; when we find Messrs. Sidebotham, Compton, and Thorpe sending more than a score, and mention that our friend Mr. Young has contributed a frame containing twenty exquisite stereoscopic subjects, we have almost said sufficient to convince our readers of the excellence of the exhibition, though some of them may think the number (about 200) rather small. Nevertheless we would wish to remark upon some of them.

Mr. Wardley's *West Door of Manchester Cathedral* is a fine bit of work, and his view of that smoky city from Blackfriars' Bridge positively recals many pleasant memories of more sunny climes.

Mr. Archer should confine himself to one branch to ensure success: he shows three pictures, each by a different process, of which the Fothergill *(Hopwood Mill)* is the best.

Mr. Petschler seems to be a persevering operator: his *Worsley Hall* deserves commendation; it is much superior to that by J. W. Thompson, who falls short in the arrangement of his subject and exposure of his plates.

Mr. Sidebotham sends some beautiful specimens: one would be surprised if it were otherwise. His *Wheat Field* and *Ancient Bridge at Strines* are highly suggestive pictures, and show careful development and printing.

Mr. Compton and Mr. Thorp seem to have been labouring at pretty nearly the same subjects, and *Kenilworth* is the best with both of them.

Mr. Mudd's pictures are all gems in their way. There is a capital print of his prize picture, *Coniston Falls* (the medal itself ought to be suspended from it); and, as a complete contrast, take his *Lincoln Cathedral from the West*, a perfect piece of architectural photography, not, we think, to be beaten by anything we have seen. Mr. Mudd's *Bridge at Yewdale*, and *Yard at Messrs. Rothwell's Works at Bolton*, and his *Old Mill at Dunham*, show how artistically very diverse themes may be treated by the same operator.

The Society's Secretary contributes some small but interesting pictures, collodio-albumen, as are all we have named. His *Shipping at Runcorn*, with pure untouched skies, are very neat, and he sends one copy of an engraving, *Crossing the Ford*, which is a capital one, and the only representative of the oxymel process.

Mr. Bennett Lowe sends two good Fothergill pictures, one of which is admired much—*A Farm in Shropshire*. The hard outlines of the distant hill is objectionable, but perhaps unavoidable.

Mr. Higgins has been very successful with *Fountains Abbey* and *Lincoln Cathedral*, and one of his pictures would be really to be coveted but for an over-exposure, which makes it more curious than correct. It represents a copse, with an old bridge, the distant foliage being singularly blanched.

A number of pictures shown by W. D. C., show a great variety of subjects, chiefly Scottish, but are all very indifferently printed.

Mr. Mabley of course is a large contributor, in both collodio-albumen and wet collodion. We must especially mention his diagram of machinery, drawn as well as photographed by himself: his *Glastonbury Abbey*, *Barrington Court*, and *Llandudno*, the one showing a general view of the town and bay. We fear, however, that Mr. Mabley has not quite done himself justice in his choice of prints: most likely the short time allowed prevented this.

Mr. Young should really try larger pictures now: his stereoscopics are complete, well chosen, neatly executed, and altogether desirable acquisitions to a dealer in such matters. He seems to have considerable rambling propensities, for he shows views of Chester, North Wales, Dovedale, Scotland, Yorkshire, and, nearer home, *Hoar Frost at Cheetham Hill*. We wonder if his fellow-worker, Mr. Parry, was with him much in these; if so, why he does not exhibit we cannot imagine, as anything from him must certainly be good.

We miss contributions from many others who we know produce good pictures in this branch, both on glass and paper, and we regret their shortcomings very much. The windows of this room would have afforded ample and fit space for the exhibition of transparencies.

I. Davies, of St. Ann's Square, sends some good pictures in collodio-albumen. We believe we must take *Rostherne Church* to be a type of his style, and it might certainly be improved on; accordingly in *Dead Game* and the *View in Yewdale* we trace a following of the master hand of Mr. Mudd.

One picture, *A View on the Irwell*, by A. F. Smith, makes us long for a sight of other productions by him.

Mr. Brothers is a large contributor, chiefly of portraits and copies of engravings. He has, however, a picture of *Manchester Exchange*, which is very good, and may go along with Mudd's *Royal Infirmary*. The lines in this plate will bear accurate testing for *correct drawing* we were going to say, but that can hardly be said, though it expresses what we mean. We recommend the use of paper more highly albumenised for untouched portraits than this gentleman uses; it throws up the half-tone much better. He has succeeded well with ivory miniatures, as two excellent specimens attest. His copies of engravings and pictures are generally good. He exhibits portraits in water colours and oil: these are on a screen in another room, not to infringe the rule so rigidly exacted as to the subjects being untouched.

The London School of Photography, who have a branch in Manchester, send eighteen small vignettes and portraits, which for cheap work are as good as any which have come under our notice.

There are no glass pictures or negatives in the exhibition.

We come now to notice the contributions of some members of the Chorlton Society. This society is but a young one, but some of its members are old amateurs: if they all produced pictures like those of *Agecroft Bridge*, by Mr. Hooper, by the turpentine waxed-paper process, we would not complain at all. Mr. Chadwick's copy of Sir T. Lauder's picture of *Christ Teaching Humility* is not badly executed as regards the negative, but we think a better print might have been shown. We cannot say much in favour of Messrs. Adin and Davies' (of Warrington) productions, under exposure marks the former, and very defective composition the latter, as well as very indifferent toning. Mr. Davies works with collodio-albumen. One of his pictures, being *a View of Great Ormshead*, should be called "Topsy Turvey;" for we are told, and it is really not a bad joke, that it puzzled all the Committee as to which was "this side up," and it was settled by finding in a corner some persons reclining; but the man who has framed the plate since (and the frames are nearly all provided by the Museum Committee) has actually placed it on its side, and the aforesaid persons may now be seen reposing comfortably (?) heads downwards,—at least it was so when we saw it. But we are sadly exceeding our present limits, and must wind up by saying that we are informed that the opening *soirée*, on the 23rd, given by the Mayor, was quite a success: we were not, however, honoured with an invitation, nor with tickets to the private view, which extended over the rest of the week, at which we are rather disappointed. No doubt during the current week, the date of the Manchester *ludi circenses*, which take place within rifle range of this exhibition, will be visited by thousands. Without wishing to disparage our national sports we cannot help saying they will here find a more rational, a more instructive exhibition, even if they confine themselves, as we are compelled to do, to this particular department; but we are sure they will not venture to gainsay our opinion on this subject when they ramble through the other galleries of the building where so many valuable specimens of paintings, of art and manufactures, modern and ancient, European and Asiatic, and such fine examples of natural history in its various branches, are deposited. Σ

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the above Society was held at the Lecture Hall, Walworth, on Friday, the 18th ult.,—W. Ackland, Esq., Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed, donations to the folio were acknowledged from Mr. Wall and Mr. Ackland, for which the usual votes of thanks were awarded.

Mr. Ackland, Mr. W. Clarke, and Mr. Hannaford, desired their names to be inserted in the list of members forming the Exchange Club.

The Rev. F. F. Statham, B.A., F.G.S., President, then read his promised paper *On the Application of Photography to Scientific Pursuits.* [See page 159.]

After the reading of the paper,

Mr. Wall said he had listened to their excellent President's very comprehensive paper with much pleasure, but really had no remarks to make about it. There was, it seemed to him, nothing to hang a doubt upon, nothing to deny, nothing to dispute, only something to admire. He had listened to it as he might have listened to some enthusiastic and eloquent friend praising the virtues and accomplishments of his mistress, with this exception, namely, that he did not feel the slightest throb of jealousy during the whole process.

Mr. Hannaford thought their President had so fully treated the subject that very little remained to be said. Some of the specimens brought down in illustration of the geological section of this paper forcibly recalled the characteristics of certain scenes in Devonshire and Cornwall, and reminded him also that there was evidence to prove that the rock basins alluded to were not all attributable to natural causes, but in at least many instances were, he thought, Druidical remains, formed upon the highest point of certain localities with a view to receiving the rain water used in some of their religious ceremonies. There was this difference between the natural and artificial basins to be observed, viz., that while the latter were provided with channels or lips, always occurring in certain positions, the former were not, which, if their formation was due to natural causes, would, he thought, be the case.

Mr. Leake, referring to the importance of photography to the geological student, said he thought a good photographer, acting under the personal superintendence of some able geologist, might do much to extend the great popularity of geology as a science.

Mr. Statham in reply, said he was conscious of not having done full justice to his very prolific subject, for to describe the possible, probable, and already adopted applications of photography to scientific pursuits, required more time than he was able to devote to them. The stereographs of rock basins which had called forth Mr. Hannaford's remarks were taken to illustrate a paper in which he intended to disprove the possibility of their artificial formation. Upon this subject, when microscopically examined, they gave much evidence. The lips or channels which Mr. Hannaford referred to were found in connexion with such basins as occupied a very exposed situation, and were formed by the mechanical action of water, influenced by wind and assisted by the loosened particles of the disentegrated granite. He had hoped that some member would have enlarged upon the subject of photography in connexion with astronomy—referred to the coming eclipse, &c.

The usual vote of thanks was enthusiastically awarded to Mr. Statham, whose kindly services and genial manners appear to have won him golden opinions from the members generally.

Mr. Ackland having vacated the chair (which was then occupied by the President), said he was desirous of calling the attention of members to a matter connected with the Fothergill process, which might possibly prove of some little importance. He had been much annoyed by getting certain particular stains on his developed plates, which always occurred near the end on which the plate stood to drain. Having ascertained that this did not arise from the draining itself, he next noticed that the water (six drachms for a stereo plate) became but slightly milky when he used *new* collodion, and very much so when he used *old*. This led him to the conclusion that the new collodion, forming the most compact film, retained the free nitrate of silver more pertinaceously than the old, and that, consequently, the same amount of washing more completely freed the latter from the silver than the former. Bearing in mind that a weak solution of albumen is not readily coagulated by nitrate of silver, he thought it possible that all the free silver in the compact (or new collodion) film was not converted into the albuminate, thus originating the stains in question, which stains he did not meet with when using the more porous collodion. Mr. Ackland then detailed some further experiments, tending to convince him more thoroughly of the accuracy of his con-

clusions; in the course of which he strongly recommended a strict habit of carefulness and cautious observation, by noting the temperature of the operating-room, chemicals, &c. To ensure a shorter exposure and yet avoid the species of stains which he had described and exhibited, he had made the following slight modifications in the Fothergill process with the most satisfactory result:—

Collodion—half new and half old—to be used within a week after the mixing.

Sensitise and wash as usual. Then pour on the albumen and immerse *before washing* in a solution of common salt. Lastly, wash thoroughly. The importance of decreasing the time of exposure without obtaining the stains which so annoyed most operators, and which, up to the present time, remained unexplained, would, he hoped, justify the time he had occupied in making this communication. In conclusion, he much regretted that Mr. Howard, in whose opinion he had much faith, as in that of a practical and thoroughly successful operator, was not present to aid the discussion.

The Secretary greatly regretted that this, their excellent Treasurer's first time of absence, was occasioned by ill health.

The President thought Mr. Ackland's remarks were of great practical value, and called upon the members to award the usual vote of thanks, which they did with much warmth.

Mr. Hannaford said the stains attributed to the albumen might arise from using it in a too dilute state. A large quantity of ammonia might naturally enough be supposed to throw down the nitrate of silver as the oxide, but in practice this was not found to be the case; and Mr. Howard, one of the most uniformly successful of operators in the Fothergill process, used a very large proportion of this ammonia. [Mr. Ackland had previously stated that he used ammonia in the preparation of his albumen.] The use of chloride of sodium would, of course, be advantageous in adding to the keeping properties of the plates. Acetate of soda would give greater intensity, and might be employed, with some sorts of collodion, with excellent effect.

The discussion was then continued by Messrs. T. Clarke, G. W. Simpson, Leake, jun., Ackland, and Hannaford; in the course of which the latter gentleman said the Fothergill process was, in his opinion, not adapted for large plates.

Mr. Ackland described some few experiments he had made with large plates, and thought this arose from manipulatory difficulties which were surmountable, and not to any defect inherent in the process. He thought at least a minute necessary to dilute the albumen.

Mr. Hannaford advised washing under the tap.

Mr. Ackland would not recommend a lengthened washing, which materially increased the time of exposure.

After some further discussion, Mr. Leake read the following—

PHOTOGRAPHIC JOTTINGS. No. 6.

I have this evening to call your attention to a modification of the tent I exhibited at an early meeting of the Society, and also to a travelling case, constructed to carry all the apparatus, &c., required for a day's outdoor photography.

The tent consists primarily of a shallow box or tray, about twelve inches wide, two deep, and twenty-two inches in length, the lid forming the top of the tent. Round three sides of these the covering of black and yellow calico is secured, the fourth being covered by a curtain of the same material, sufficiently large to wrap round the operator and exclude light. The top is supported by two light iron rods, which keep the covering in a state of tension, thus ensuring perfect rigidity. In front of the tent a portion of the black covering is removed, and yellow substituted, to admit sufficient light for convenient working. A gutta-percha tray, with a flexible tube attached, carries off the waste water, and the whole is supported by a tripod stand of a height to suit the operator. When not in use, the covering folds into the box, of the dimensions above given, which may be carried by the handle attached to its side. The weight is about four and a-half pounds.

The travelling case is constructed of mahogany, and contains spaces properly fitted for the camera, bath, chemicals, plates, and all the various paraphernalia requisite for a day's out-door photography. The size of this box is about eleven inches high, eleven wide, and six inches thick. I think this will be found to be a useful piece of apparatus, as the operator will be able, on looking over his box, to tell at a glance if anything is missing. Messrs. Squire and Co. have at my request undertaken the manufacture of this apparatus, and to them I must refer those gentlemen present who have been inquiring where it might be procured.

A vote of thanks was awarded to Mr. Leake.

The President thought Mr. Leake's apparatus very ingeniously contrived, and singularly portable.

A similar opinion was expressed by all the members present.

Mr. Ackland exhibited a camera (Powell's) with certain recent improvements and increased accommodation for the dark slides, which met with much approbation.

The President said, hearing that it was the wish of the Committee that their first anniversary meeting in June next should be of a more than usually pleasant and social character, he should be glad to meet the members at his own residence upon that occasion.

The Secretary warmly thanked their President for the kindly feelings expressed in his present very generous invitation, and in his past services, but could not consent to avail himself of an offer entailing upon that gentleman expenses which it would be scarcely fair to permit him to incur.

Mr. N. E. Fitch rose to support the Secretary, and to thank their respected President for his great kindness.

It was then arranged that at their next meeting the members be invited to a *soirée*, to be held at St. Peter's School Rooms, near the church gate of St. Peter's, Walworth.

NOTICE TO THE MEMBERS AND COMMITTEE.

Upon the occasion above referred to, refreshments of a simple description, music, stereoscopes, microscopes, &c., will be provided. Mr. T. Clarke has also promised to exhibit in the lanthorn a series of photographic slides, and it is hoped that various other objects of interest and curiosity will be exhibited by the members and their friends, all of whom are specially invited to attend upon this occasion. The annual report will be read a little before the usual hour of meeting, and the election of officers and new members duly proceeded with immediately afterwards. The Secretary has received the names and addresses of several gentlemen desirous of joining the Society, and will be glad to increase the list. All communications may be addressed to him at No. 90, Cannon Street West, City. The members of Committee will hold an additional meeting on the Wednesday previous to the usual evening appointed for committee meetings, and make the necessary arrangements, &c.

ALFRED H. WALL, *Hon. Sec.*

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The twenty-fourth ordinary meeting of this Society was held on Monday, the 21st ult., at the Golf Club House, Blackheath Hill,—the President, Charles Heisch, F.C.S., in the chair.

The minutes of the last meeting having been read and confirmed, the President made known to members a plan which was being agitated for holding a *soirée* during the present season, jointly with other societies in the neighbourhood.

It was moved by Mr. South, and seconded by Mr. John Harding,—"That this Society join the Greenwich Natural History Society and the West Kent Microscopical Society in a *soirée*, to be held at some convenient time and place during the present season."

It was moved by Mr. Glaisher, seconded by Mr. Spurrell,—"That this Society bear one-third of the expense of such *soirée*."

"That the President, two Secretaries, and Messrs. H. Terrel and Wood, be appointed a committee to meet that of the other Societies."

It was then resolved unanimously,—"That a gold medal be offered to the Golf Club, as a recognition of their kindness to the Blackheath Photographic Society in allowing the meetings of the Society to be held at their rooms; such medal to be considered as a prize medal, to be held under regulations to be laid down by the Golf Club." The Secretary to procure patterns and estimates, to be placed before the Society at its next meeting.

The President then called upon Mr. T. R. Wheeler, who proceeded to read a paper *On the Solar Spectrum in its Relation to Photography*. [See page 162.]

At the conclusion of Mr. Wheeler's paper, the President described the mode in which paper was prepared for photometric purposes, explaining the difficulty which attended it, and the precaution necessary.

A vote of thanks was cordially tendered to Mr. Wheeler.

Mr. Melhuish then exhibited some photographs of Rome, also a particularly interesting series of stereoscopic Sicilian views, lately photographed by Mr. Napper.

The meeting was then adjourned.

The following, read at the April meeting, has been circulated amongst the members:—

THIRD ANNUAL REPORT OF THE COUNCIL.

The Council of the Blackheath Photographic Society, in presenting to its members their Third Annual Report, cannot but congratulate them upon its present position and future prospects.

Established three years ago by about seven members, the Society has now increased to forty-two; and the treasurer's account shows a balance of not less than £43 15s. 7d. in favour of the Society.

Its prosperous financial condition is to be attributed in no small degree to the courtesy of the Golf Club, at whose rooms the Society's meetings have been held during the past year. The Council beg to tender their best thanks to the officers of the Club for their continued kindness.

During the session 1859-60 the Society's meetings have been numerously attended, and the following list of papers read before it testifies to the zeal and energy of its members. The Council take the opportunity of here acknowledging the kindness of the press in all that relates to the publication of their transactions, referring especially to the *Photographic Journal*, The British Journal of Photography, the *Photographic News*, and the *South London Journal*.

PAPERS READ BEFORE THE SOCIETY UP TO THE PRESENT PERIOD OF THE SESSION.

"On the Application of Photography to Investigations in Terrestial Magnetism and Meteorology, as practised at the Royal Observatory, Greenwich." (Concluded.) By the President.

"A Paper on Van Monckhoven's Cellulose Process, as investigated and practised by T. R. Wheeler."

"A Paper upon Positive Printing." By A. J. Melhuish.

"On the Employment of the Salts of Magnesium as Iodisers." By Charles Heisch.

"The Pistolgraph and its Use." By T. Skaife.

"The Method employed at the Royal Observatory for registering by Photography the Diurnal Variations in the wet and dry bulb Thermometer." By the President.

"On the Reproduction of Engravings, Prints, Ordinary Writing, or Letter-Press on Prepared Papers by Contact in the Dark." By Chas. J. Busk.

A review of the subjects touched upon testifies that the appeal made to members by the Council in their last report has been well responded to; but they would earnestly reiterate that appeal for original matter to be brought forward at the Society's monthly meetings, feeling persuaded that their success will be promoted from this, rather than from any other source.

The Council cannot point to any very striking contributions to the practice of photography during the past year. The nature and composition of the photographic image—a question of high interest to the photographer—is still occupying the attention of chemists. The experiments recently made by Mr. J. Spiller, of the Royal Arsenal, Woolwich, published in the *Philosophical Magazine* for March, 1860, tend rather to confirm the conclusion of MM. Davanne and Girard that the image consists of a mixture of metallic silver with unchanged chloride, and are so far opposed to the views of Messrs. Maskalyne, Hardwick, Hadow, and Llewellyn.

The alkaline gold toning processes are still receiving considerable attention, each modification having its particular advocate. The method, generally, bids fair to be a great improvement upon the old process.

The prints exhibited by M. Joubert, said to be from ordinary negatives, with printer's ink, are superior to any ink pictures yet produced; but, as his process is still a secret, the Council can offer no opinion as to its practical application.

Cognate to the subject of photography are the experiments of MM. Bunsen and Roscoe, lately detailed before the Royal Society, which will be read with great interest by every photographer.

An attempt has likewise been made to employ cotton dissolvèd in oxide of cuprammonium instead of collodion, recommended by Van Monckhoven as immeasurably cheaper and, in some respects, more uniform in its composition than collodion. The process would appear to merit further trial.

Since the publication of the last report the Council have the pain of recording the decease of two of the Society's members—Mr. Hughes, of the Royal Hospital, Greenwich; and Mr. Howe, of Dartmouth Row—the latter a practical photographer. It may not be superfluous here to note the loss the scientific community has sustained in the death of Mr. Andrew Ross, the optician, of Featherstone Buildings.

The Council have considered it expedient, during the course of the present session, to present to members of the Society a print, from a negative kindly lent by Mr. Glaisher for publication; and it is their intention, as far as the funds of the Society will permit, to follow that issue by one or more during the ensuing year, as may be determined by a committee appointed by the Council for that purpose.

In conclusion, the Council congratulate the members upon the high perfection to which photography has arrived in its numerous practical applications, not less than upon the prosperity of the Society itself,—pressing upon them the necessity of research and original experiment, as the true means by which advancement is to be hoped for; and feeling satisfied that what is added to the general store of facts, not only promotes the character of the source from which it emanates, but becomes the property of mankind for ever.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held on Tuesday evening, the 29th ult. Mr. Haines, one of the vice-presidents, occupied the chair.

Mr. Sutton, of Jersey, was to have been present for the purpose of reading a paper on *Panoramic Photography.* From some cause, however, he did not make his appearance. Much disappointment was expressed by the members at this, as no provision had been made for having another paper read; and the Secretary was requested to ascertain why the engagement had not been kept.

The only business transacted was the election of Mr. H. P. Robinson and Mr. Keene, of Leamington, as members of the Society.

Mr. Robinson, who was present, exhibited (in an unfinished state) one of the composition pictures for which he is becoming famous in the photographic world.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

SHADOWS.

(See Maxims 42, 43, 44, 37, 38, 54, 63.)

Now work upon the half shadows* with a *thin* mixture of Venetian red and Chinese white, your object being to destroy the coldness of the photographic hue and assist in converting it into a warm greyish tone.

A few delicate touches of pure vermillion (thinly applied) may be next used in the shadows, and a little madder carmine† may be combined with it for the more intense darks, over which may also be worked a mixture of madder carmine with Indian yellow and Indian red, until the blackness gives place to a warm transparent effect, which, if these colours be judiciously used, will soon be apparent. Still, remember what I have so constantly urged, viz., *don't hurry.* If any shadows require defining more strongly, use for the purpose madder-brown: those which are called "cast-shadows,"‡ and which will be found upon the shadow side or beneath projecting features or surfaces, will be sure to require strengthening in parts with this pigment.

THE EYE.

(See Maxim below 45.)

Put in the pupil of the eye with indigo, or indigo mixed with a little lake and sepia; the iris with cobalt, outlined with a little cobalt and indigo; touch in the reflected light with cobalt and Chinese white;§ strengthen the markings of the lower eyelid with Indian red or madder brown (the latter if the photograph be faintly printed); and touch in the lash with "warm sepia:" this latter colour may be also used for the eyebrows. The edge of the upper eyelid must be warmer and less dark where nearest the nose. Soften the edges of the shadows at the corners of the eye and under the lower eyelid by hatching and stippling upon them with cobalt and light red. Work into the socket of the eye a faint, delicate lilac tint with a little madder pink and cobalt. Take a little cobalt over the white portion of the eye, and work some of the same between its corner and the nose. Put a few touches of vermilion and madder pink into the corner of the eye nearest the nose.

THE CHEEK AND LIPS.

For the lips and cheek a colour is made by mixing vermilion and madder pink, using most of the one or the other pigment according to the requirement of your model. For the complexion you are now painting, or supposed to be painting, use rather more vermilion than pink. Hatch and stipple the colour into the cheek with patient care, and with faint and oft-repeated touches, preserving the purity of the colour, and avoiding every appearance of an artificial effect by softening and diffusing the pink into the greys around. This done, colour the lips with the same, using a little lake and vermilion for the upper or shadowed lip, softening the edge of the lower lip with great care, and preserving the high lights, half and reflected lights, toning down the colour as it recedes from the light, but at the same time securing a fresh, bright, moist appearance. Owing to the light's chemical "effect dejective" the lips are almost invariably too dark, and the high light too large, as I explained when speaking of the treatment to be adopted for polished bodies. For this reason rather more vermilion may be used for the lips than the cheek; and sometimes it will be necessary to prepare the lips for colouring, by working upon them with thin washes of Chinese white, slightly warmed with a little vermilion; upon which, before proceeding with the colour, it may be as well to use the burnisher, but do not do so until the colour is perfectly dry. If the white is put on too thick it will work up and spoil your colour. In applying the colour over the white use that recommended for the cheeks, and having less vermilion. The division of the lips and the darker touches may be given with a little lake and burnt sienna.

* The half shadows will be found between the lighter half-tones and the shadows, uniting harmoniously the first with the last.
† In the list of pigments given in a former chapter this colour was forgotten.
‡ Shadows which are cast by projecting surfaces.
§ Supposing the eye to be blue.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

G. P.—I am glad you find the papers so useful.—One of my most earnest and sincere friends and a very able teacher.—See report in the present number. Shall be glad to meet you.—The background contains too many straight lines. Beauty is the soul of art, and curved being always acknowledged to be more beautiful than either horizontal, perpendicular, or oblique lines, it follows that your picture lacks an element of success, when there is no reason in the world why it should do so. If straight lines are necessary, let them be soft and indefinite—not abrupt and hard. In arranging accessories acquire a custom of tracing an imaginary outline which shall bound and unite every object; and if this outline is a graceful one, and otherwise consistent with the rules of composition, you may be sure that its subtle influence will make itself felt even in the minds of those who are unable to detect its actual existence. Nothing is more essential to all who would produce pictures—whether by pencil, brush, or camera—than a knowledge of the laws governing artistic composition. See reply, in the last number, to "A. S." The case you describe is that of "a blind and rash barbarity, which rejects what is most beautiful, and seems with an audacious insolence to despise an art of which it is wholly ignorant."

A Brother in Arms.—Hope you pay more attention to your drill than you have done to my instructions. All I can say to you is—"Atten-sion!" "Right-about-Face!" "Quick-Mar-r-r-ch!" "Halt!" and being "as you were," *begin again,* but this time *at the beginning* you must stay longer in *my* crypt before you can claim your "first-class ticket" up stairs. I am afraid you are one of our self promoted comrades who, having passed one day in the crypt, one in the yard, and the third in the hall, applied for a corporal's chain and—*somehow*—got it. Those who enlist with the volunteer colourists don't "go-a-head" in that style.

A Lady.—The flesh is too chalky; the greys too uniformly cold, or too decidedly blue. The pinky colour in the cheek is too pure and peach-like in hue for the sallow complexion: it is unnatural and inharmonious—work a little venetian red and indian yellow over it. The greys, half-tones, shadows, &c., must all harmonise with the general appearance of the complexion, or the effect will be strikingly untruthful.

M. J.—See reply to "A Lady," and remember that the reflections should blend tenderly into the shadows, and, unless the object from which the light comes is visible to decide the colour, keep them warm.

An Artist whose Works have been Hung on the Line.—You might be a laundress whose "washing" was hung on the line, from the style in which you speak of art. If *I* thought photographic colouring that which you term it, I might adopt your advice; but the study of colour may be pursued for its own sweet sake with as much advantage to me in connection with photographic colouring, as painting and drawing (according to your own admission) have been to you. You may be very sincere in your remarks, and, believe me, I do not appreciate the motive which dictated them the less from being of an entirely opposite opinion.

Foreign Correspondence.

Paris, May 26, 1860.

For the worthy inauguration of this correspondence, in which it is my intention to sum up from fortnight to fortnight the most important facts connected with photography in France, I should have liked to have some capital discovery to announce—

some sure method, for instance, of obtaining unalterable pictures, or the fixation of the natural colours, or aught less wonderful even. But, alas! I have no such tidings to communicate. Spring has in vain lavished her longest days—the sun in vain has shed his brightest beams—our experimentalists, if not idle, are at least mute. Not the smallest secret leaks through the bolted doors of their laboratories. The Photographic Society itself, which had expected some interesting experiments for the monthly meeting of Friday (the 18th instant), was obliged, in the absence of those who had promised, to defer its hopes for another month. During the ten years that I have driven the critical pen, I have remarked at different periods such moments of pause; but I must add that they have nearly always been followed by important discoveries. And, besides, our seekers have already found enough to be entitled to occasional repose without hearing themselves accused of sluggishness. Well, then, there is nothing new in the form of process; but so far as production is concerned, the activity of the little photographic world, living in the midst of the great Parisian city, —a working tribe that nothing distracts or arrests,—*that* is anything but flagging. Our artists are profiting largely from the favour accorded to their works by the public; and they do right. Every day they offer to the eager but capricious crowd of amateurs numerous and attractive productions. At present there is not a printseller of any importance who does not exhibit in his windows from day to day a certain number of photographic pictures, to say nothing of the opticians, and of those shops where the stereoscope reigns absolute.

Shall I tell you what are the publications which more particularly attract the attention of the crowd, and which are to be met with everywhere? In the first place, I will mention the reproductions of paintings and drawings executed with so much industry and talent by your countryman, Mr. Bingham, who has, so to speak, monopolised this difficult application of photography. The list of them is long. First, there is a large portion of the pictures which figured in the last Exhibition; then the complete works of Meissonier, of Paul Delaroche—a real monument—and of Ary Scheffer, a religious *epopée*. Letter-press has been added to the last-mentioned work, which is the most important of the kind which photography has hitherto produced. Mr. Bingham has also reproduced a good number of paintings and designs by various authors, which appear every day in the windows of our publishers, attracting the passers-by, and holding them spellbound. I must also mention the splendid collection in which Messrs. Bisson Brothers have brought together the principal views of the glaciers of the chain of Mont Blanc. These pictures have a boldness and a beauty of execution which fully justify their success. Lastly, I will speak of the *Galerie des Célébrités Contemporaines*, an exhaustless series of card-portraits, invading even the stationers' shops, and thence inundating the *salons* and also the *boudoirs* of Paris and the provinces. What I am saying is not by way of criticism; I do but state a fact. These little portraits are in general very cleverly executed by some of our best *portraitistes;* only, what is to be regretted, and what offers a singular idea of our French public, is, that this collection, commencing with the Imperial family, and including our most eminent men in politics and in literature, in science and in art, finishes off with the erratic figure of Mademoiselle Rigolboche, one of the lowest actresses of one of the lowest theatres in Paris, whose sole title to renown is her impudent immodesty. I will add that this portrait is not the least sought after, and that it will certainly bring larger profits to the author and the publisher than will those of certain men who have spent their lives in the noblest labours of intelligence. *O, tempora! O, mores!* The vogue enjoyed here by card-portraits in general really passes belief. Several of our artists do nothing else, and their *ateliers* are besieged by the crowd. It is, in fact, quite a mania. At all the bookbinders and the stationers you see richly-bound albums, with clasps, which are specially destined to receive these portraits *à la mode.* The most graceful gift that can be offered to a lady at present is one of these volumes, in which she can bring together all her friends, allotting to them such and such a page, according to the place occupied by them in her heart. One fashionable lady, in my circle of acquaintance, received three of these albums within two days: it is true that she has many friends.

I cannot pass over in silence one very important fact, which will be of great advantage to photography. In all the *ateliers* which I have visited during the past fortnight, for the purpose of gathering information and news to communicate, I have found that the one theme of conversation and object of enthusiasm is Woodward's solar camera. The constant answer to all my questions was a lengthened eulogy of the apparatus and of the advantages possessed by it. In fact, after having seen what it produces, one is obliged to acknowledge that the results are wonderful. During ten years I have witnessed the attempts made to amplify the pictures by means of various instruments, but nothing hitherto obtained is comparable to what is offered by the new solar camera. The first picture which Mr. Bingham presented to the French Photographic Society, and which was the reproduction of a stereoscopic picture, was much admired; but since then much better and much larger ones have been produced. A few days ago I saw in the *studio* of Messrs. Mayer Brothers and Pierson, bust-portraits of the size of nature, and surpassing everything which photography has obtained up to the present time. My excellent and illustrious friend, M. Claudet, who was passing through Paris on that day, accompanied me in my visit, and, familiar as he has grown with the prodigies of our art, he was, like myself, wonder-struck.*

I saw M. Pierson operate in my presence—he made three pictures upon iodine paper from the same *cliché* (17 centimètres by 21): the first in thirteen seconds, the second in seven, and the third in two seconds. In the development we recognised that the first was over-exposed, the second was better, the third was perfect. Count Aguado has also obtained some very fine results upon salted paper, which is much slower; but another amateur, whose name is equally well-known in the photographic world, has gone farther. He has reproduced full-length card-portraits with an amplification which reaches the proportions of nature. These pictures are nearly six feet high. To attain this end he places on his screen three sheets of paper in juxta-position, and these, receiving at the same time the same impression, take in the subsequent baths exactly the same tint, and when well joined form but one and the same picture. In this manner full-length portraits of the natural size can be obtained, with the inconvenience of gigantic dishes and costly baths. For this kind of work amateurs and professional men have all adopted similar arrangements in their studios The apparatus is fitted, on the sunny side, to one of the walls of a dark room sufficiently large to admit of two or three persons moving about freely, and performing the various manipulations. An easel mounted on truckles supports the screen, and may be placed at the requisite distance from the apparatus by means of two wooden rails upon which it slides. To obtain a direct picture upon positive paper it is necessary to expose for nearly two days.

At the moment of closing this letter, I have received from M. Vernier, of Belfort, to whom we are already indebted for useful information, the communication of a process, which the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY may perhaps be able to turn to account. It is a method for harmonising over-exposed pictures, and consists in plunging them into a bath of cyanide of potassium composed as follows:—

Water	600 grammes.
White cyanide of potassium	1 gramme.
Concentrated liquid ammonia	6 grammes.

Notwithstanding the smallness of the quantity of cyanide, this bath is sufficiently active to harmonise the image in from four to eight minutes, according to the intensity of the positive; but its employment is still more advantageous for pictures taken upon *clichés* presenting a great opposition between the lights and the shades. In this case the chloride papers must be very considerably over-exposed, and then passed to the chloride of gold and the hyposulphite of soda, without paying attention to the intensity of the shades. After being slightly washed they are treated in the bath in question. The details of the shades now gradually appear, and the picture becomes harmonised. When taken out of the bath it must be copiously washed. It is advisable to cover the cyanide bath with a transparent glass, in order to avoid breathing its unwholesome exhalations.

I had nothing to tell you when I commenced, and now, I perceive, my letter has grown to an immoderate length; I will endeavour to make my subsequent communications shorter. May fortune favour me with wondrous news to announce!

ERNEST LACAN.

New Books.

Practical Hints on Photography: its Chemistry and its Manipulations. By J. B. HOCKIN.

London: Hockin & Co., Duke Street, Manchester Square.

IT is by no means uncommon to meet with a large amount of promise with a very small quantity of actual performance: the mountain in labour brings forth the ridiculous mouse too frequently to astonish any one, but we very seldom hear of the molehill producing an elephant.

* Our readers will be aware that we hold a very different opinion upon this point.—ED.

We do not assert that the latter phenomenon is to be witnessed in the present instance; but certainly Mr. Hockin not only fully acts up to his professions, but goes beyond them. He offers only chemistry and manipulation, and gives something of photographic optics in addition, though the latter is upon the principle *qui facit per alium facit per se*, being written, as we are informed in the book itself, by Mr. C. P. Symonds.

The present work, though not exactly a fourth edition, is an expansion of a modest pamphlet that has passed through three editions, and bears about the same proportion to its derivative as the "cell" to its "nucleus." The author is a practical chemist, whose "facts" may be received without question; and if his opinions based thereon are sometimes open to discussion, they at any rate deserve to be considered with respect. He is, indeed, pre-eminently a practical man, who, though not infallible, knows well what he is about; and should he chance to fall into error (as who does not at times?) is not ashamed to retrace his steps. If it be asked, "What has this to do with his book?" we say "much,"—it shows him to be a reliable guide.

We now proceed to give a short analysis of the contents of the work, and propose subsequently to make a few comments. The first sixteen pages consist of descriptions of various lenses and other pieces of apparatus, and are followed by a like number relating to the chemicals, manufacture of collodion, preparation of solutions, &c., with three more upon the dark and operating rooms. Manipulation occupies about forty pages, including the various modifications of the collodion processes wet and dry, as also a chapter on fogging and failures. Positive printing on paper, toning, paper negative processes, &c., all have attention, with eight pages of very practical matter "On Saving Residues." The optical part, by Mr. Symonds, next appears; then a chapter on chemical manipulation, and one on photographic chemicals, their preparation and analysis, concludes the work—the number of pages very aptly coinciding with the chemical equivalent of iodide of potassium, viz., 167.

Mr. Hockin differs materially from some authorities in a few fundamental principles of operation; for instance, he prohibits the use of acetic acid or fixed nitrate of silver in the bath, and recommends ammonia to neutralise an acid bath in preference to carbonate of soda, for all of which reasons are assigned, possibly not unanswerable, but good ones as far as they go. We have, however, an objection to take against a somewhat rash assertion relative to the use of cyanide of potassium as a fixing agent, which the author prefers very decidedly to hyposulphate of soda, both for positives and negatives. In producing the former, the use of cyanide is a necessity, in order to obtain the best results, but for negatives its employment is not imperative. "Many," says our author, "are prejudiced against this chemical on account of its being highly poisonous, but I think unnecessarily, *as it only becomes injurious if taken into the stomach:* its odour is by no means unpleasant, and *not at all injurious.*" The italics in the preceding quotation are ours, and we notice the paragraph because we think it a mistake likely to be mischievous.

A skilful and noted photographer, whose name is familiar to most of our readers, very nearly lost his hand by the use of this same chemical, the cyanide of potassium. It is true he had employed it for years with impunity, but the time came when, having a slight scratch on the finger, the cyanide attacked the vulnerable part—the finger swelled enormously, an open wound was established, the bone sloughed away, and at one moment serious fears were entertained by his medical attendant that amputation of the hand would have become necessary.

We are personally acquainted with a second case, showing that caution is requisite in dealing with this chemical. An eminent physician, who is an amateur photographer, having but little time to spare for practising the art, generally took large-sized positives, in consequence of their being completed at once. He noticed that whenever he had had a spell at photography, he generally suffered afterwards by an attack of the lungs, resembling incipient pneumonia. After repeatedly observing the same thing, he abandoned positives for negatives, using hyposulphate of soda instead of cyanide of potassium as a fixing agent, and the annoyance ceased. We think it but right to mention these facts —not to attempt to banish cyanide from our service, but to induce caution in its employment. Being forewarned is being forearmed.

On glancing through the pages we have marked for comment, we find their number so great that to notice all would require far more space than we can afford; there are so many useful hints that are also suggestive, that were we to dilate upon them we should probably tire our readers long ere we had come to a conclusion; before doing which, however, we would remark upon a matter alluded to by Mr. Symonds. This gentleman appears to think that lenses would be improved if made with elliptical or parabolic instead of spherical curves, and that opticians have been deterred from attempting their construction on account of the difficulties of manipulation. We do not agree in this view, and probably Mr. Symonds will change his opinion when he remembers that the *oblique rays* would suffer far more if transmitted through lenses with elliptical or parabolic curves than when their surfaces are spherical. The axial rays are comparatively easy to deal with,—it is the oblique ones that require the utmost consideration.

Mr. Hockin has adopted an arrangement of great convenience and utility in his book, in attaching to the principal paragraphs a sort of abstract, in the form of marginal references, which materially assist the student in finding what he seeks. We strongly recommend this useful little work to photographers that are or that wish to be: it will well repay its cost.

Correspondence.

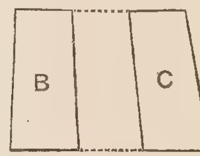
☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

PHOTOGRAPHIC GOSSIP.

No. II.

To the Editor.

Sir,—In the last number of your Journal you particularly call the attention of your readers to Mr. Grubb's article *On Perspective and Distortion.* To me his ideas thereon appear by no means conclusive. In fig. 2, page 143, he gives a tower, B, with converging perpendiculars (is that not rather an Irishism?); and to show the absurdity of so drawing it, he "takes the liberty" of placing by its side another and *similar* tower, C, leaving between the two a space equal to the breadth of one such tower. Now I think he has taken too great a "liberty" in giving the tower C a separate and distinct vanishing point of its own; for it is quite impossible that, placed as described, it can have other than one and the same vanishing point as B, supposing but one point of view—which, by-the-by, Mr. Grubb so frequently puzzles us by calling "point of *sight*,"—a widely different matter. As to how we get "deeper into the dilemma by making the intermediate space converging," and, consequently, the tower C to lean inwards, I cannot perceive; for that follows as a natural consequence of the principles on which B is constructed, and if part is right or wrong, the whole is right or wrong, and must be disposed of accordingly. Supposing, as he does, for the sake of argument, the tower B to be correct; then in adding C, Mr. Grubb should have drawn it as below, so that the two will have but one vanishing point. His deduction, then, as regards the intermediate space, falls to the ground (perhaps he will tell me my towers stand a good chance of doing the same), and with it his "*argumentum ad absurdum.*"



I grant that it appears ridiculous to call this a correct representation of perpendicular objects; but it must be borne in mind that the drawing is here greatly exaggerated.

Looking down perpendicularly from a bridge, say thirty feet high, crossing a line of railway, so that the point of sight—the *real* point of sight this time—shall be in a position at right angles to such line, then, according to Mr. Grubb, the tramways should be drawn strictly parallel; but according to those who hold the converse opinion, they should be rendered as in the above diagram. Which I think right and which wrong I may endeavour to show in a future gossip after discussing other positions Mr. Grubb has taken up in his articles; but for the present *quantum stuffit* (you are fond of Latin quotations), as Mrs. Penelope Ann Spriggins would say.

Mr. C. J. Busk's paper *On the Action in the Dark of Engravings or Letterpress on Silver Sensitised Paper*, recals to my mind a fact of which I made a note some time since. I had occasion to leave a print in the pressure-frame for about twenty-four hours, and on taking it out found the back of the paper quite discoloured, excepting a portion accidentally protected by the corner of another piece of sensitised paper, thus plainly showing that the reducing influence came from *behind*. I repeated the experiment, keeping the frame altogether in my dark room, and met with a like result, whether black velvet or white paper was placed in contact with the sensitive paper. A piece of albumenised paper, sensitised, and "bronzed" in the sun, had no such reducing power. Hence, whenever I have to expose under a dense negative in a weak light, I invariably place a piece of "bronzed" paper between the sensitised paper and the back of the printing frame. In the inclosed specimen the white device has been protected by a design cut out of the "bronzed" paper, leaving the darkened portions to remain in contact with black velvet. The reduction was perceptible after twelve hours, and increased until in about four days it produced the depth of tone you perceive.

Mr. Israel Holdsworth favours us with some rather original suggestions. It is great nonsense, by his account, for people to talk so about different sorts of collodion. Anything does for him. He prefers Hanson's (whoever he may be), because it is cheapest. The notion that it is best when freshly made, is false—to his satisfaction. He seldom uses new, but likes it "deep in colour almost like treacle." Did he ever try golden syrup? When he permits the ether and alcohol to evaporate by leaving out the stopper of his bottle, the residue, I presume, is available for the dry collodion process. Mr. Hardwich has written about half-a-dozen papers on this article, and occupied as many evenings of the Photographic Society, besides letters, "comments," &c., without end, all on collodion—collodion! Why can he not, Mr. Holdsworth would probably ask, let us use Hanson's, or anybody's who can undersell him, and give us all sorts of valuable information instead? Mr. Holdsworth never meets with bad chemicals—lucky fellow! Only "keep your chemicals clean," and develop from a measure "crusted both inside and out with sediment," &c., and you may hope to produce—results.

In my last you make me imply that Mr. Robinson had thrown up a "tank" in his "small back yard," to serve as a model for the "top of a mountain." Mr. Robinson is a very clever manipulator, but I do not

see how he could have turned his tank to such account, unless, indeed, he had taken it after Turner, most awfully out of focus, and called it a Scotch mist. For "tank," read "*bank*."—I am, yours, &c.,

MICHAEL HANNAFORD.

[We perfectly coincide with Mr. Grubb's very conclusive arguments, but will leave him to reply, should he see fit to do so. Mr. Holdsworth "puts in an appearance" on his own account, so that we need not fight his battle.—Ed.]

THE COLLODION COMMITTEE.

To the Editor.

Sir,—Will you allow me space for a few remarks on the discussion at the last meeting of the Photographic Society? Mr. Malone made the general assertion, that the opposition to the collodion report came from those who were intimate with makers of collodion, and that he knew how to judge of criticism that must be interested. Pretty strong language from one who deprecates personality! Being one who has opposed and criticised the report, perhaps as strongly as any one, I beg, on my own behalf, and that of the Blackheath Society, which adopted my remarks, to deny the assertion, as far as we are concerned. Even supposing we were capable of being influenced by the unworthy motive attributed to us by Mr. Malone, we were happily kept out of temptation, not one person present during the discussion being so much as personally acquainted with a single maker of collodion. One other assertion of Mr. Malone I must also notice. It would be absurd in us to affect not to know that the "neighbouring society" to which Mr. Malone refers, is the Blackheath Photographic Society, as I believe no other society has criticised the report. Mr. Malone says we asserted that the parent society did not know what it was about. While repudiating altogether the parentage of the London Society, we distinctly deny that any such assertion was made or intended. A document, emanating not from the society, but from a very small section of it, was criticised because of its inconsistency, and because we thought it so worded as to be mischievous; but it was never asserted, even of the authors of that document, that they did not know what they were about, far less was such an assertion made of the society at large, which has not even now adopted the recommendations of the document in question. Much good has, however, come out of the late discussion, notwithstanding the endeavour to represent, or rather misrepresent, all criticism of the report, as an attack either on Mr. Hardwich or his collodion. We now learn the sense in which the words "superior excellence," and "unsurpassed sensibility," were used by the committee, viz., that the collodion is one of a class of good collodions, and that compared with the recollection of the majority of the committee of their former experience, it is as sensitive as any they ever used. Every one will, of course, judge for himself of the relative value of the recollection of these gentlemen, and the direct comparative experiments of Mr. Morgan, who asserts that under identically the same conditions he did obtain pictures in half the time with another collodion. While glad that the committee have thus explained their meaning, I cannot admit the correctness of Mr. Malone's illustration of the meaning of words. I quite agree that, if he were to say of any one that he was a man of superior mind, the assertion would be taken for what it was worth; but suppose a committee of the Royal Society to print a report, in which some individual was said to be a man of superior mind and one whose mathematical knowledge was unsurpassed, would any one think that this only meant that the individual in question had the average intellect of an F.R.S., and was merely a good mathematician? A *dictum* of a committee of the London Photographic Society ought to bear the same relation to collodion as the one I am supposing would to the subject imagined. We are next told that the contradictions noticed in the report only prove its justice, and arise from faults being mentioned in detail and excellence only generally. This reminds me of the story of the Irish woman, who, on being taxed with not being too particular in her morals, exclaimed, "Will, thin, though I am a thafe, and something more, I should like to see the hole ye can pick in me morals." Why, the faults so honestly detailed by the committee are utterly inconsistent with excellence of any sort. If the collodion be excellent, the faults are imaginary; if the faults exist, the collodion cannot be excellent. The most important information, however, obtained during the discussion was the reason that another formula sent in had not been examined, viz., that it recommended the use of Swedish filtering paper instead of cotton. Was one word said in the advertisement requesting formulæ to be submitted to the committee to intimate that the important question of what substance should be used in the manufacture of pyroxyline had already been decided, and that no formulæ should be examined that did not coincide with the preconceived notions of certain members of the committee? Had the *reason* come from any but a member of the committee I should have hesitated to believe it. On the general question Mr. Malone will find that it requires something more than the assertion that he knew something of paper-making in early life to convince the world that Berzelius, Régnault, and other chemists of celebrity, are mistaken when they call Swedish filtering paper *the type* of pure cellulose. I am quite prepared to maintain that you are far more likely to obtain a uniform substance by taking two sheets of Swedish paper out of two different reams, than by taking two samples of cotton out of two different bales. One other remark, and I have done. In his opening remarks, Mr. Hardwich said that his formula involved a "new principle," and promised to explain what it was at a later period of the evening. I have looked in vain for any such explanation in his later remarks; possibly the lateness of the hour made him forget it. I regret this the more, as I have failed to find anything like a new principle by a diligent study of the formula itself. Mr. Hardwich tells us what he considers the best proportions of acids, and the best temperature to work it. Some may agree with, and others differ from him, but the novelty of *principle* I cannot see.—I am, yours, &c. CHARLES HEISCH.

Middlesex Hospital, May 28, 1860.

PHOTOGRAPHIC MANIPULATION.

To the Editor.

Sir,—In your Journal of the 1st inst., in the report of the meeting of the South London Photographic Society of the 19th ult., I find some attention directed to a letter of mine which appeared in your issue of the 16th of the same month. That letter, I flattered myself, was written in such plain language that no one could misunderstand it who had sufficient intellect to enable him to take a photographic picture. It appears, however, that gentlemen of some professed attainments may read it with misapprehension. In reference thereto "Mr. Howard thought extreme carelessness seemed to be characteristic of some operators." Now, if Mr. Howard had read it with proper attention, he would have seen in the first paragraph that it professed to be a detail of lengthy "experience," written for the benefit of such as might comparatively lack that important desideratum. Pray, what could I or anyone else mean by a mode of manipulation founded upon "experience," but that *careful* observation had demonstrated a mode of accomplishing the end proposed, which it was found advisable to practice? I need not tell you that, to take a photograph successfully, the combined action of specific natural laws requires to be effected. Now, as every operator in any art or science is aware, there is a direct as well as a roundabout way of accomplishing the intended purpose: even extraordinary care succeeded by failure, and seeming carelessness attended with success. When the latter is the case, the apparent carelessness is such only to the uninitiated, for the result is proof positive that all the required conditions have been complied with, and that whatever more is done is roundabout and superfluous. Therefore, that which Mr. Howard characterises as "carelessness" may, for aught he knows, and *is* to my certain knowledge, specific and scientific exactitude. When I tell him how simply and successfully I go about my business he ought to believe me, or at least hold his judgment in suspense till he receive more light on the subject, unless he is already able to demonstrate its impossibility, which, of course, *I* know he is not. I should not dispute his word if he were to tell me that it required from him, to be successful, three times as much care as I bestow, for I know it to be both possible and probable.

I was aware when I wrote the letter that it was somewhat heterodox, and therefore was prepared to find it frowned upon by the devotees of orthodox routine. Nevertheless I was not at all deterred from stating the truth, for I was convinced that there was a great deal of photographic quackery afloat, which I hate, as I hate all quackery.

If the report be correct, Mr. Simpson opposed my letter by an erroneous statement, namely, that I said I had "no failures." What I did say does not admit of a dispute; that your printed columns at once decide. The words are these:—"I seldom have a failure from any cause, except in misjudging of the light." What, I ask, can be plainer? Mr. Simpson may now see, if he choose, not only that I did not say I had "no failures," but that I specified one annoying source of failure, and by implication acknowledged others. Mr. Simpson appears also to have made himself merry at my expense, as he supposed, and at the same time displayed, in addition to his photographic knowledge, his "logical" attainments. Well, let him get his laughing done, and then we shall see what his logic is worth.

He says:—"When a man of such a stamp *said he had no failures* it is more than probable that less partial judges would say he had no successes." Here Mr. Simpson, like myself, is "very logical." He starts with false premises, as I have shown, and, *ergo*, arrives at a false inference. Let what he says be taken in the form of a syllogism:—

I (Mr. Simpson) make an erroneous statement; a person cannot be successful respecting whom an erroneous statement is made; therefore Israel Holdsworth cannot be successful!

Again, he says that I "not only asserted that 'a deal of nonsense is written,' but accompanied the assertion with a most conclusive proof of the fact."

"Proof of the fact!" does Mr. Simpson say? What nonsense! Before he had set himself up as a scientific censor, I think he would have shown a better understanding, or more modesty at least, if he had made himself acquainted with some of the leading words in its vocabulary. He ought to have known that a "fact" does not admit of "proof," but of demonstration; that *truth* only can be "proved." Whatever be his attainments in other respects, I think it is clear that his critical acumen would not be injured by a re-perusal of his school-books.

But let us see what the statement means. It must have been intended either as literal or figurative. If literal, it makes his logic turn upon himself in the form of "nonsense," by admitting the truth of what I stated. For, let us logicify it, and it will stand thus:—Israel Holdsworth says, "a deal of nonsense is written; he has accompanied the assertion

with a most conclusive proof of the fact;" therefore "less partial judges would say he had no successes!" Logic! Bah!

If his language was intended as figurative—irony—I would ask him, since the thing is not self-evident, why he did not show my statements to be erroneous? I answer, "It was more easy to laugh than to do that." But I would remind Mr. Simpson that matters of science are not to be proved either true or false with a laugh, and that, at an earlier stage of the meeting, the Secretary threw out a suggestion by which he might have profited, namely, "that the substitution of ridicule for argument was not consistent with either good taste or sound sense."—Yours, &c.

Leeds, May 7th, 1860. ISRAEL HOLDSWORTH.

[We would suggest to Mr. Holdsworth that a simple and effective way of turning the laugh against his opponent would be to forward a specimen or two for exhibition at the next meeting of the Society, to the worthy Secretary, Mr. Wall. We can promise him that he will receive full justice and a fair field, with every reasonable favour.—Ed.]

WET OR DRY?

To the Editor.

Sir,—I should feel much obliged to you if you would inform me, in your next number, at *what shop in London* I can procure Dancer's developing dishes for stereoscopic plates, referred to by Mr. Hardwich at page 399 of his Work on Photographic Chemistry.

You imply, in your answer to "A Persevering Amateur," that the dry process is more difficult than the wet. I suppose you mean if the amateur is to prepare his own plates; otherwise surely such is not the case?—I am, yours, &c. S. T. COPLEY.

[1. Murray and Heath, Piccadilly, or Bolton and Barnitt, Holborn Bars, keep them, and probably many other dealers in apparatus.

2. We should scarcely consider any one who *habitually* works upon dry plates prepared for him by another worthy of being described as a *photographer*, but merely a dabbler in photography. Certainly to succeed in the dry processes the operator has more to do than with the wet ones, and the chances of failure are increased: hence our reply.—Ed.]

PHOTOGRAPHY IN ITS APPLICATION TO SCIENCE.

To the Editor.

Sir,—Can you inform me whether any work or paper has been yet published showing how far photography may be made subservient in delineating, with that unerring truthfulness of which it is capable, the phenomena and objects of the chemical, physical, and natural history sciences?—I am, yours, &c.,

London, May 28, 1860. F.R.S.

[Some time back a work of the kind you are inquiring for was *announced* for publication, to be illustrated by photographs and stereographs, but we believe it has not *yet* made its appearance. Besides an article on the subject, by the Rev. F. F. Statham, in our present number, we have in recollection a paper by Mr. S. Highley, *On the Application of Photography to the Illustration of Works on Microscopy, Natural History, Medical Science, &c.*, in the volume of the *Microscopical Journal* for 1853; also a more extended paper on the same subject, and another *On the Application of Photography to War Purposes in the Army and Navy*, illustrated by special apparatus, read before the Liverpool meeting of the British Association.—See *Reports*, vol. xxiv., 1854.—Ed.]

MRS. SPRIGGINS ON PATCHWORK.

To the Editor.

Sir,—Oh! my! you can't emagin wot wos my felinks wen on the last 15th of April as ever wos, the two pair back's brother came in a-larfing like everythink and says, says he (with The British Journal of Photography a-sticking hout of his pocket), "Mrs. Spriggins," says he, "ITS IN," says he, "and won't you be a suspicious caracter now and no mistake" (which wos his way of compressing hisself. "Mr. Snooks," says I, "don't compose upon me, *don't*;" and then wot should he show me but my hone blessed name as large as everythink in real print. Wel! I could'nt help larfing hout loud, and come all over of a heat like, and "Oh!" says I, "wot *will* Jim say wen he comes home?" says I. And wen I wos by myself agin, I says to myself, "It don't magnify a bit," says I, "for Ive received a good edication and I'll be a littery author wot writes for books." And says Jim, which a better lad never stepped in shoo lether after super with his glass of grog before bed, with his pipe, says he, "Do." So I got Mr. Snooks, which reeds butiful, and so he dus to reed me sumthink hout of one of his books about a Mr. Robinson Crusoe wot noo sumbody with a forrin name in french which Mr. Snooks could'nt talk, so he left that hout, and about how he went two thousand years ago and composed "five of the most butiful girls of the town" into "a single figger" which he said was one of the dim conditions of iniquity, or sumthink of that sort: which *he* wanted them to do the same thing, only different like, in photography. And wen he sed as how he joined together a lot of bits of girls and made one hole one, my hies lighted up and I felt I had a hidear, which here it is Mr. Editor, which a real gentleman you is and so says all of hus as as they sings in the song.

Now my idear is—PATCHWORK!

And I says with Mr. Robinson Crusoe, I says "It is rather singular that so little has been done in this branch" becos "the method was practised for many years" by my Grandmother and her patchwork quilt which ansum it is *now*, is on the two pair back's bed at this werry time. Now I asks in the words of Robinson Crusoe and I says how is this? "It cannot be that we have no hartists among us; we cannot hall be so devoted to science that we discard hart" and then again he says, and so do I, says he "It is possible that prints from several negatives combined" (or as I says pieces from the rag bag) "do not pay so well commercially as proofs from a single glass; but that should not prevent enthusiastic followers of such a pleasing art from pushing it to its greatest extent; and its application to the highest art purposes is certain." Wel! praps the quilts hall in a piece is cheaper after hall, but wot's that to the *hart* of patchwork? thats wot I says, and so does Robinson Crusoe!

Now all I says is this ere, let that there Photographic Society of Scotland as they calls it offer a prize for the best piece of patchwork and I'm the *hartist* that will sho my work for it and then let 'em jest pay my railway carridge and find me a nights lodging and bored, which it must be fit for a eyely respectable female mind you and see if I don't reed em a paper which will "give them some information on the method I employ in producing" patchwork quilts from a whole lot of little bits, thats all.

Hopin you and your family are well as this leaves me at present I am yours unseterer, PENELOPE ANN SPRIGGINS.

P.S. Mr. Snooks says it wasn't Robinson *Crusoe* but sumboddy else which was werry much at see.

ANSWERS TO CORRESPONDENTS.

☞ Foreign Correspondence.—M. Lacan, Editor of *La Lumière*, it will be seen, is now our Correspondent at Paris.

Amateur (Shields).—Use albumenised paper if you want minute detail.

Geo. Williamson.—Send the particulars, and we will advise you what to do.

R. A.—The *first* on your list stands the highest, and then the *third*, the remainder are a long way behind. We could, however, name a better than either.

Faint and Flat.—"Any port in a storm." You did the best you could under the circumstances.

Amateur (Edinburgh).—You can procure any No. of the Journal from Mr. Wood. As to dry processes, their name is legion: we recommend, however, Fothergill's or Taupenot's processes in preference to any others for amateurs. Dr. Norris's process is also excellent.

Perplexed.—We do not wonder at it. Depth of focus is all fudge, which accounts for your negative being all smudge. If you want to delineate objects in widely differing planes, the only scientific way of proceeding is to employ a very sharp lens, and *use a small aperture*.

Holder.—We do not think that the kind you mention to be compared to a good *pneumatic* holder. The parts which touch the edge of the plate must come in contact with the solutions, and this is not the case with the pneumatic form. You must remember, however, that there are good and bad ones of the latter kind; but we know of three different forms that are just—perfect.

J. Smith.—Either your toning bath must have been nearly exhausted, or, what is more probable, the sensitising bath (nit. silver) had been so reduced in strength by use, that the amount of *free* nitrate of silver left on the paper was insufficient to allow your proof, when taken from the pressure frame, to have reached the bronzed stage in the shadows, in which case there would not have been sufficient energy to reduce the gold.

A Manchester Photographer.—A specific gravity bottle, or hydrometer, is of *no use* for testing the strength of the nitrate bath after use: your conjecture is correct. An instrument, under the name of an argentometer, is, however, sold by Mr. Hughes, of Oxford Street, Hockin & Co., Duke Street, Manchester Square, Horne & Thornthwaite, Newgate Street, London, and several other dealers, which perfectly answers the purpose, as the result depends upon the production of chloride of silver. The action is both simple and efficacious.

J. L.—Your plan is perfectly intelligible. Remove the woodwork on the west side, and paint the dwarf wall on the same side as pure a white as you can, the object being to reflect as much light on that side as possible. Place your camera as near to the north wall as you can, and *bring forward* your sitter and background several feet—say from four to six feet. The screen over head (which should be only of white calico) should be lowered a couple, or even three feet. Try this, and we do not think you will have to complain of flatness.

R. Mulock.—Proto-nitrate of iron is made thus:—Take protosulphate of iron 320 grains, and dissolve it in 1 oz. of hot water, and in like manner 300 grains of nitrate of barytes in 3 oz. of hot water; mix and stir—a thick white precipitate will fall down (which is sulphate of barytes), filter out through a paper filter, and preserve the clear liquid, which should be of a delicate pale green colour, in a closely stoppered bottle for use. It will not keep long, particularly if the bottle be not quite full. It should be used without any acetic or other acid; and when freshly made, the positives developed with it are of a brilliant metallic hue, like frosted silver.

C. J. (Birkenhead.)—We are obliged for the proofs, which have been duly received. You might have used a larger stop without detriment, and materially reduced the exposure. Generally, the maker of your lens cuts down the aperture more than necessary, being over careful of his reputation for sharpness. Do not be afraid of using a large aperture (except where there is much difference between the nearer and more distant objects), and you will get more vigorous results, and with much less exposure. You have succeeded very well with it, but we do not much admire the process you have used, regarding it as inferior to the Fothergill one, and quite as troublesome. You will probably cover your *small dots* easily by adding a little alcohol to the water.

Bothering Amateur.—By "a fresh solution of hypo." is meant a portion that has not been used for fixing on a previous occasion. There seems to be no tendency to decomposition of a hypo. solution until one part, by weight, of chloride of silver has been imparted to three of hyposulphite of soda—then hyposulphite of silver is precipitated in a crystalline state, and chloride of sodium remains in solution—that is, if the prints have been previously freed from nitrate of silver by washing before being placed in the hypo.-bath. Read Mr. Dawson's paper in our number for May 1st, and our Leader for May 15th. Add twenty minims of alcohol to the developer you name, *if it will not flow*. Iron developer for intensifying process:—Water one ounce; proto-sulphate of iron fifteen grains; glacial acetic acid fifteen minims. The linseed tea preservative process is simple, and would meet your present requirements. We have heard this process much lauded by a professional photographer of great experience.

Joseph Day.—From what you have stated in your present and former communications we believe your nitrate bath solution is irremediably at fault, through your having introduced *various* matters into it, and keeping it in a gutta-percha trough made of impure or inferior material; we, therefore, recommend you, as the shortest way to get out of your difficulties, to precipitate the silver of your nitrate bath by adding to it a solution of common salt; dispose of the chloride of silver thrown down to a photographic chemist, and make a fresh solution of nitrate of silver In future keep your bath solutions, for negative and positive collodions, distinct. Thoroughly cleanse your gutta-percha trough, and coat the inside with shellac varnish; use a glass dipper. By attenti n to these points you will probably avoid the fogged and dirty plates you complain of. We should, however, advise you to study some such cheap guide book as that lately published by Mr. Hockin. There is no objection to the use of pure spirits of wine for plate cleaning, but add some precipitated chalk or whiting. If your friend *cannot* afford to buy a lens, we really *cannot* assist him in that matter. The queries at the end of your note are like your plates—foggy! Put them in a clearer form and we shall be happy to answer them.

⁂ In Type.—A critical notice of Mr. Rodger's Stereographs, letter of "A. Y.," and several other communications.

THE BRITISH

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It has been frequently remarked that more information is sometimes gained by failure than by a successful operation. The reason is evident: failure leads to inquiry concerning its cause, while most persons are content with success, and ask no questions. In like manner it may be asserted that the enunciation of a scientific error occasionally leads to a knowledge of facts that would probably have otherwise remained for some further time in obscurity. We have now before us a case in point, in the valuable and highly interesting facts brought to light by Mr. Dawson, in consequence of a too hasty adoption of an untenable theory by gentlemen enjoying a very high reputation amongst their photographic brethren in the French metropolis. It is unfortunate that the most energetic workers in scientific investigations are precisely those that are liable to fall into a mistake of the kind above alluded to; but as the advance of the art is no doubt the ruling principle in their operations, as a matter of course, when convinced of an error, the gentlemen alluded to will in all probability seek to arrest the promulgation of a faulty principle put in circulation upon their authority.

We publish in the current number of this Journal an account of further experiments made by Mr. Dawson in reference to the supposed rapid saturation of hyposulphite of soda with hyposulphite of silver — experiments which not only fully confirm all that he has advanced in his previous paper on the subject, but which also tend to demonstrate the probable source of another annoyance to which photographers are sometimes exposed, the production of what have been aptly termed "measly spots" in paper positives. From observations that we had personally made with regard to this kind of inconvenience, we *conjectured* that it was owing to a partial combination of the sizing material of the paper with an unstable compound of silver. Mr. Dawson has gone further. He has plainly shown that this conjecture was correct; and not only so, but he has very ingeniously exhibited the probable *rationale* of the phenomenon, for the details of which we must refer our readers to the paper itself. We can promise those who are interested in the scientific branch of photography that it will well repay careful consideration.

In connexion with the subject of Mr. Dawson's paper we have the pleasure also of publishing one by Mr. Oakeshot, to whom we are in some measure indebted for the investigations of Mr. Hardwich and Mr. Dawson, which were undertaken in consequence of a letter from him, read by one of the members of the North London Photographic Association at a meeting held a short time back. Mr. Oakeshot's paper establishes several interesting points connected with positive printing, viz., that a new hyposulphite bath has less tendency to part with a portion of its sulphur than one which has been previously used; that fifteen minutes' immersion in the fixing bath is amply sufficient for its effective action upon the prints; that the treatment of the latter with boiling water is a pretty severe test of the efficiency of the hyposulphite of soda employed. It also equally demonstrates that the alarm sounded by our continental friends was a needless one.

Before quitting this subject we have a word of caution to offer in reference to the general adoption of the practice of treating proofs to a hot bath, viz., that such a proceeding completely removes also the sizing material of the paper, which, before the prints are mounted, should be restored, as they are otherwise apt to assume a kind of feeble, worn-out aspect, and present a very unsightly appearance when the adhesive material used in mounting possesses any depth of colour. If the prints are mounted with the aid of not over-thick paste, or clear solution of isinglass or gelatine, either of these will act also as a size; but if other adhesive matter be preferred, it is advisable previously to restore the sizing by floating the proofs on a warm weak solution of gelatine — one containing about three grains to the ounce of water answers very well. The object of this treatment is to prevent the penetration of the mounting solution.

We perceive, from a paragraph in the last number of the organ of the French Photographic Society, that until very recently our continental brethren have been puzzled by the appearance in the English journals of formulæ for collodion directing the use of *methylated* alcohol — a substance with which they have been happily unacquainted, and with which we trust they may be fortunate enough to remain so; for we are convinced that its use is but false economy, its tendency to produce incurable disorder of the sensitising bath being now pretty conclusively demonstrated. It is not surprising that French photographers should be somewhat in the dark about it, seeing that in all processes in which alcohol plays an important part they possess a very great advantage over their English competitors, owing to their freedom from the *onus* of a heavy Excise duty. Although it is stated in the paragraph alluded to that methylated alcohol is employed as a *cheap* substitute for the pure article, to our French friends the cause of the difference in cost is evidently still enveloped in mystery—and well it may be so, for the wilful contamination must appear to them as little short of an act of insanity.

At the last meeting of the Photographic Society, as will be seen by our report, a paper by Mr. Dallmeyer, bearing the title, *On Distortion as Produced by the Present Forms of View Lenses, and on an Improved Construction of Lens Free from this Defect,*" was read. Knowing the author of the paper to be a clever practical and theoretical optician we attended the meeting, anticipating some important addition to our optical resources as applied to photography. But, alas! we were destined to be grievously disappointed. On subsequently criticising the title of the paper, we perceived that, but for one word—" improved "—it might possibly have been contended that every promise held out had been redeemed, but the introduction of that one word is, in our opinion, fatal to the establishment of such a proposition; and even omitting it, if the letter could have been regarded as fulfilled, the spirit certainly could not. It will appear almost incredible to our readers when we inform them that not even the most trifling novelty of principle or construction was introduced.

The lens submitted was simply a good-sized *ordinary portrait combination*, with sliding diaphragms between the back and front constituents—neither more nor less; and with regard to the specimens exhibited, their smallness of size was preposterously disproportionate to that of the lens with which they were produced. We wish it to be distinctly understood that neither to the lens nor to the paper itself have we any other objections to make than those already stated; but as we well know the great interest felt by photographers generally in the subject before us, we cannot, consistently with our duty, abstain from recording a strong protest against the adoption of a misleading title, such as that of the paper on which we are treating.

With regard to the subject matter of the paper itself, we should have given an abstract of it but for the fact that the whole substance of it has been already published in this Journal repeatedly, but especially at the time when the orthoscopic lens was first introduced (about two years since), and again when the Lens Testing Committee of the Photographic Society of Scotland issued its report. On both of these occasions we entered pretty fully into the particulars of this subject in our leaders. Those of our readers who will take the trouble to refer back will perceive that we pointed out, at the times specified, that the *kind* of distortion produced is dependent upon the position of the stop, which, in the ordinary single landscape lens, is placed at a distance in front, causing a square figure to be delineated as one somewhat barrel-shaped; while the orthographic lens, having the stop behind the positive combination, produces on the contrary the hour-glass kind of distortion, as regards what should be rectangular figures. We shall probably allude further to this subject in our next.

We desire to direct attention to two notices in connexion with the South London Photographic Society, which will be found in the usual column of the present number. We have also to remark that this Journal being the official organ of several societies, the members of which are each supplied with a copy, it is in contemplation, by the managing body of one of the societies, to offer the option to any member desiring it of receiving instead of the Journal an additional photograph to that already given, in order to meet the cases where gentlemen belong to more than one society, and thus receive duplicate or triplicate copies of the Journal. We cannot be accused of interested motives in recommending the regulation to our other constituents.

ON THE MUTUAL REACTION OF CHLORIDE OF SILVER AND HYPOSULPHITE OF SODA.

An Inquiry into the Cause of the "Measly Spots" in Positive Proofs.

By George Dawson.

[Read at a meeting of the North London Photographic Association, May 30, 1860.]

In the absence of other matter for discussion this evening, I propose to call your attention to a few concluding experiments and observations I have made, since our last meeting, on the solubility of chloride of silver in hyposulphite of soda. There is, indeed, but little to add to what I have already stated, except the confirmatory evidence of a repetition of my experiments with purer materials and with more decided results: my remarks, therefore, shall be brief, but I trust thoroughly conclusive. Allow me this opportunity of thanking you for your kind forbearance and patient attention on a former occasion, while occupying so much time which might otherwise have been employed in more pleasurable discussion.

I have been attempting to demonstrate a truth which I believe few practical photographers ever doubted, viz., the great solubility of pure chloride of silver in hyposulphite of soda, without producing in the solvent any tendency to the formation of crystals or other deleterious matter in the texture or on the surface of the paper immersed therein. We all know that a deposit, when it does occur, arises from causes widely different, some of which I shall afterwards explain to you. The challenge lately sent us by a photographer of great practical experience compelled the Society, in justice to itself, to discuss the question. He, like a few others, became alarmed in consequence of a contrary statement published by men said to be of high reputation in science, but who, in their researches relative to the subject of positive printing at least, have added but little to our stock of knowledge, and that little appears to be anything but correct. Their assertion (which I have been endeavouring to combat) of the extraordinary fallacy that the supernatant liquor of the crystalline deposit from hyposulphite of soda, saturated with pure chloride of silver, represents a solution of Herschel's salt $Ag.\,O, S_2\,O_2 + 2\,(Na.\,O, S_2\,O_2)$ is both chemically and practically erroneous. This their own analysis clearly shows. In other respects, whenever they have made any valuable suggestion I find the same fact has been before stated by Mr. Hardwich, in one or other of his many papers, unfortunately scattered over several periodicals. The real facts are (and any one with a tolerable modicum of patience may verify them for himself) as follow:—

Solution of hyposulphite of soda, of any strength, will dissolve chloride of silver, till no trace whatever, either of silver or of hyposulphite of any kind, is left in the original solution, but which will contain only chloride of sodium, the hyposulphurous acid and silver having combined to form hyposulphite of silver, which falls in the form of white, crystalline, opaque, heavy grains.

Before testing the remaining solution for the presence of hyposulphites and silver, it is necessary to submit it for an hour or two to a strong light; for it must be borne in mind that chloride of silver is slightly soluble in chloride of sodium. The action of the light throws down a small quantity not of hyposulphite or sulphide of silver, but of semi-reduced subchloride in an extremely fine state of division. The following tests will exhibit the nature of the liquid:—

Boiled with hydrochloric acid, no cloudiness nor precipitate being produced shows the absence of a hyposulphite. Hydrosulphuric acid or hydrosulphate of ammonia does not cause any trace of a precipitate, showing the absence of silver.

A drop evaporated on glass under the microscope exhibits cubical crystals precisely similar to those of an artificial solution of chloride of sodium, and on platinum wire communicates to the blowpipe flame the same intensely yellow colour peculiar to the salts of sodium. Lastly, the addition of nitrate of silver produces pure chloride of silver.

As regards the precipitate, viz., the hyposulphite of silver, it may be dried at a low temperature in the dark, and preserved possibly for any length of time: it is soluble in hyposulphite of soda, the solution soon beginning to decompose. It is decomposed also by heat, light, water, and even in the dark when the atmosphere is moist, the decomposition in every case ending in sulphide of silver.

Not to enter into more chemical details as to the foundation of my belief, I may now, I think, confidently state as a fact what I had only previously surmised, that pure hyposulphite of silver is formed by the gradual addition of one equivalent of chloride of silver ($Ag.\,Cl. = 144$) to one of hyposulphite of soda ($Na.\,O, S_2\,O_2 + 5\,HO. = 124$), the decomposition and recomposition being, in chemical language, expressed by the formula—

$$\underbrace{Ag.\,Cl.}_{\text{Chlor. of silver.}} + \underbrace{Na.\,O, S_2\,O_2}_{\text{Hyposulp. of soda.}} = \underbrace{Ag.\,O, S_2\,O_2}_{\text{Hyposulp. of silver.}} + \underbrace{Na.\,Cl.}_{\text{Chlor. of sodium.}}$$

With these remarks I have done, and I trust for ever, with this part of the fixing theory. I shall now advert, as pertinent to the present question, to a few practical and rude facts which will every now and then thrust themselves forward on our notice in the shape of imperfectly fixed prints of various degrees and kinds. The general question is too wide for one evening's discussion; and indeed I have not given sufficient attention to it in all its bearings to venture on pronouncing a decided opinion on many cases I have seen. We have enough before us at present in endeavouring to investigate the causes of failure in one class, several specimens of which were exhibited at our April meeting, and gave rise to considerable discussion. These prints were recognised by many members as old acquaintances, which they had more than once unfortunately stumbled across in the course of their own experience. They have been aptly denominated by Mr. Hughes, I think, the *measly class*, showing by transmitted light opaque blotches in the interior of the paper, and on the surface much flatness and a yellowish tone. The specimens I have examined were—two or three of those you have already seen—in a highly developed stage of the disease. We had no information to guide us, further than the fact that they were "printed upon paper kept some time after being albumenised and fixed in new hypo. which soon decomposed." The absence of full information was to some extent desirable; for, had we possessed more, it is probable we should have been satisfied with tracing to its source the particular fault before us, without discussing other causes which may have produced a like result.

In the prints then exhibited the paper was very thick, highly albumenised, and of a particularly non-absorbent character. On carefully removing the albumen with a sharp knife I found directly underneath, and entangled in the interior fibre of the paper, a plentiful crop of a yellowish-brown substance, easily collected and removed. It was insoluble in the strongest hypo., also in sulphuric and hydrochloric acids, and but slightly soluble in nitric acid. Under the blowpipe it was easily reduced into metallic silver. Boiled in water it turned quite black, with the evolution of sulphurous acid. And this same change, or one nearly analagous to it, goes on slowly but surely in the picture itself at ordinary temperatures, especially in the presence of moisture—with this difference, that the sulphur arising from the measly blotches in the interior does not escape, but finding on the surface of the paper more silver wherewith to combine, actually does so, and finally transmutes the whole picture into one uniform dirty yellowish-brown colour. There can be little doubt, therefore, that the substance of these *measles* consisted of either hyposulphite of silver in a state of decomposition, or of sulphide of silver, or (as I strongly suspect) of an organic silver salt, formed by the albumen and sizing of the paper.

The important question now arises, what produces in the texture of the paper a deposit which gives to a photograph this hideous appearance, and eventually destroys it?

The effect may be produced artificially in several ways. Many, I dare say, will be suggested in the course of the evening, and some may still exist which "are not dreamt of in our philosophy." For how can we know what impurities in the sizing, in the bleaching, in the very fibre even of the paper, the maker accidentally or otherwise may have placed there? This much is certain, the quality of the paper exercises an important part in facilitating this formation. For out of upwards of ten different kinds of paper tried by me, I have only in two instances been able to induce artificially an immediate attack of the measles by a *fresh* solution of hyposulphite of soda of a strength of ten per cent. It is probable some of the other papers treated in the same way will eventually manifest similar symptoms. In the meantime they are uniformly translucent by transmitted light; and therefore if the deposit consists of hyposulphite of silver, no decomposition has set in, and it may be dissolved by fresh hypo. One mode of procedure in order to produce the defect was this:—Three papers were excited and printed in the usual way, washed to get rid of free nitrate. They were then pressed closely together so as to form one mass, and immersed in the hypo. for twenty minutes. At the end of this time the middle print, through its whole texture, was sadly diseased, with a tendency to get worse and worse, even in fresh hypo. Another piece of the same paper, floated on hypo., produced similar effects; so also when immersed for a very short time.

A second cause, independent of that previously mentioned, is the use of stale albumen, a practice, I fear, but too common among the albumenising fraternity. A sheet of paper prepared with this must almost under any circumstances develop sulphide of silver; and this deposit may be formed before immersion in the hypo. bath, or must have acquired a strong tendency to form because of the sulphuretted hydrogen set free from the decomposing albumen and retained in the interior spongy fibres of the paper.

If the hypo. solution be weak, and the paper employed be of a thick, highly-sized, non-absorbent nature, with a rather thick coating of albumen, we have here again another source of danger. To illustrate this I have brought some pieces of albumen, a few of which have been in weak salt and water for some minutes, others not so previously to being soaked for five minutes in strong solution of nitrate of silver. One side of each was exposed to the action of light. They were afterwards washed for several hours in running water under a tap, and also treated with salt water to destroy, as far as possible, free nitrate of silver. Finally, they were stirred about for one hour in the strongest hypo. and well washed. You will observe from cutting transversely through one of these slices, that the nitrate of silver has penetrated farther in five minutes than the hypo. in one hour—that so far as the latter has penetrated in sufficient force the former has been almost completely removed. Adjoining this, and towards the centre of the slice, enough of the hypo. has reached to convert the nitrate or albuminate of silver into incipient sulphide, at first of a yellowish colour, but after a few days, or immediately on the application of heat, becoming quite black.

In using thick non-absorbent paper, highly charged with argento-organic compounds, I think, from the examples before you, the danger must be very obvious. For in order to attack the chloride and albuminate or other organic salt of silver in the interior, the hypo. must filter through the albumen on the surface, or through the slowly absorbent fibre of the paper; and this under unfavourable circumstances may be only in quantity sufficient to form hyposulphite of silver of a very unstable kind, which, unless immediately removed by fresh hypo. passes into the insoluble sulphide.

I have not had time to examine how far the presence of free nitrate of silver in the paper, or of acidity and partial decomposition of the hypo. bath, assist in the formation of these blotches. Combined with the causes above mentioned the predisposing influence must be large, especially in decomposing the hyposulphite of silver, immediately on its formation, into another and highly insoluble compound.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 6.

At the present season, when the practice of dry collodion photography is at its height, we shall persevere in our attempts to ventilate the subject in the most complete manner, in order that the *pros* and *cons* of every process may be understood. In affirming, as we did in our last, that the presence of albuminous bodies in the preservative agent had a tendency to prevent fogging and irregular reduction of silver on the non-exposed portions of the plate, we did not intend to assert that such a protective effect is confined to that particular class of bodies, or to say that the presence of nitrogen in the protecting substance is essential. So far from such being the case, it seems that many of those organic subtancess which reduce nitrate of silver to the metallic state have the same tendency to prevent fogging as that exhibited by albumen. Thus, if we preserve a washed collodion plate with cane sugar, we find it more liable to give a cloudy picture than when grape sugar is used; or if we employ Fothergill's process, and observe that the picture developes in an indistinct or misty manner, we may often remedy the defect by applying a final wash of gallic acid, after the albumen: this will brighten the negative and preserve the shadows clean and transparent. A particular condition of the sensitive film is required to render it susceptible of a strong actinic impression. If this exists in the collodion itself, either from the pyroxyline having been made in a certain way or the collodion having been kept in the iodised state, then very little artificial aid will be required, and all that the preservative will be called upon to do will be to keep the film in the proper physical state. In such a case the exact nature of the preservative is certainly not of the same importance, and a solution of cane sugar, twenty grains to the ounce, will answer the purpose and give a clean picture. When, however, the collodion is wanting in those qualities which cause the exposed plate to exert a strong attraction towards the particles of reduced silver, and draw them off, so to speak, to the image, then those particles will be thrown down irregularly and the developer will become turbid. The caseine in serum of milk and the coagulable matter in infusion of malt are both likely to prevent this turbidity, as is also the grape sugar in the latter liquid.

At the last meeting of the South London Photographic Association the subject of dry processes was brought forward, and we have since been thinking over the remarks made by Mr. Ackland upon that occasion. He speaks of the difference between a porous and a non-porous collodion. A friend of ours has been in the habit of examining collodions as regards their porosity in the following manner:—He exposes the sensitive plate with the *glass side* towards the object, so as to form the latent picture upon the *under surface* of the collodion. Then, if the film be very horny and impenetrable, the developer will scarcely act; but if, on the other hand, it be open and porous, the reduction will take place as usual. We ourselves, in giving an opinion on a porous collodion, should be disposed to inquire how the porosity was produced. If it was brought about by the gradual liquifying action of an alkali, or an alkaline iodide, the collodion will be likely to give an intense negative in Fothergill's process; but if, on the other hand, the porosity of the collodion be due to the use of pyroxyline made with very weak nitric acid, then the negative will be feeble. Happening to have by us a sample of collodion made with this latter pyroxyline, we sent it to Mr. Ackland to try, feeling sure at the same time that he would not be pleased with it. His answer was what we anticipated, thanking us for the trouble we had taken, but stating that the collodion did not succeed. Since then a gentleman from a more distant part of the country has requested that we would assist him in producing a sample of this "porous pyroxyline," so termed; but we have declined doing so, feeling that it would not answer

his purpose. If these papers should meet his eye, and he be still desirous of preparing a pyroxyline which will not dry up very rapidly after sensitising, we advise him to work with a nitrosulphuric acid containing a medium proportion of water, and to raise the temperature to 170° or 180° F. In this way he will get what what he wants as regards the physical properties mentioned, without reducing the intensity of the pyroxyline in that very complete manner which nitric acid in a greater state of dilution with water tends to do.

Mr. Ackland speaks of transparent markings at the place where the albumen was poured on. Do such markings arise from a solvent action exerted by the albumen itself upon the precipitated albuminate of silver? It occurred to us that it might be so, from our having observed that the precipitate first produced on adding a few drops of diluted solution of nitrate of silver to the Fothergill albumen liquid disappears on stirring. We ask, therefore, in the next place, what would be the effect of treating the prepared Fothergill plate in the wet state with several fresh portions of albumen? Would the albuminate of silver first thrown down be afterwards taken up again? or would its combination with the iodide of silver —for we may now be certain that there exists such a combination— enable it to withstand the excess of albumen? If so, again we ask, what is the cause of the transparent spot observed by Mr. Ackland? In our own practice we have not seen this spot, and are unable to conjecture why it should occur with old collodion and not with newly iodised collodion.

We are still of opinion that the Fothergill process, as compared with some other dry processes, is slow of development. At first we thought that this must be due to the shrinking of the collodion in drying, which happens in that process from the excess of albumen having been washed away. We therefore obviated this by preparing a Fothergill plate in the usual manner, and then flooding it with a thirty grain solution of gum arabic before dessication. To our surprise, however, this plate developed with less rapidity than an ordinary gum plate prepared without albumen, and on repeating the experiment in various ways we became, at length, quite convinced that the presence of the albumen had a positive action in retarding the development, although by allowing a longer time a dense negative could be obtained. Previous to this we had also noticed that plates prepared by Major Russell with a strong solution of meta-gelatine containing gallic acid did not develop as quickly as plates made with gum and gallic acid. We are therefore disposed to consider that the chemical nature of the organic preservative exercises an influence upon the rapidity with which the latent picture is rendered visible, and that this effect does not depend altogether upon the density of the preservative, or upon the extent to which it keeps open the pores of the collodion film.

"COMPOSITION" versus "PATCHWORK."

By A. H. Wall.

Unlike sundry editors who hope to make their own lights shine before men with greater effect by popping an extinguisher over every minor wick, the editorship of The British Journal of Photography has been characterised by the greatest liberality, and opinions the most antagonistic to the Editor's have found frequent expression in pages from which a word of his could exclude them. I am therefore encouraged to send, for insertion, a few words upon the subject of "composition printing," as some term it, or what our worthy acquaintance, "Mrs. Spriggins," calls "patchwork." Believing that these "composition" prints show the most palpable signs of non-composibility, I incline to the latter definition, and, with your permission, will tell "the reason why."

In reference to some of the Editor's observations upon this subject, he will pardon me for adding that I think he has somewhat mistaken the drift of Mr. Hannaford's remarks, and the intention apparent in the epistle of our amusing friend, "Mrs. Spriggins." The gentleman denounced the practice of calling a bank a mountain, and the stream of water from a print-washing machine a river; and the lady ridiculed pretensions to artistic qualities based upon no better foundation than that of patchwork. I am also inclined to think that you have mistaken deception for imitation, which is a widely different thing. I would not willingly disparage the productions of such talented men as Robinson and Rejlander, both of whom I greatly respect; but it is time that photography should take higher ground than it has hitherto done, and make its claims to the artistic known and respected in a sphere from which it is as yet excluded. To show that the art is *capable* of effecting such an advance as I contemplate would be apart from my present purpose, but this may be done easily.

If the intention of our "patchwork" printers is deception, in the sense of making one thing look like another, they fail most signally — the only deception attained being that for which their beautiful art suffers to a very serious extent. This deception (which I most earnestly denounce) is that which substitutes things unreal for others which they are palpably unlike, and so brings photography (an art which has its highest and *only* value in its wondrous truthfulness) into disrepute. Take away *this* good name, and it is "*poor indeed!*" Of course I admit, with Horace, that "fiction to please must wear the garb of truth," but this is no argument for cutting "the garb of truth" to the fashion of fiction.

Now it is, I think, clearly impossible that the most talented and skilful photographer can, *with a pair of scissors*, approach the appearance of that imperceptible boundary of vision which, for want of a better term, we call the outline — a thing which the painter, *with all his power of mechanically softening one colour or shade into another*, finds most seriously difficult of imitation. I appeal to all who have ever touched a pencil under the eye of a competent instructor or the guidance of a cultivated taste to bear me out in my assertion. In an artist's mind the sweetest charm possessed by a really good photograph lies in the very quality these barbarous wielders of the scissors would so ruthlessly and thoroughly destroy. Upon my word, this cruel cutting is, in my opinion, downright sacrilege, substituting as it does the hardest, sharpest, and ugliest of outlines for that exquisitely softened and melting boundary which we only meet with in nature and in photographs.

Again, to take another view of the matter: although it is true that artists compose a single statue from the selected beauties of many figures—that the landscape painter will produce a picture from no better model than a little earth with a few sticks and stones—the portrait painter the head of a beautiful young female from that of an ugly old male model—or that another will draw an earthquake from a load of coals shot down on his studio floor; still the first does not *literally* model the extremities of this figure and take the *fac-simile* head of that to be simply stuck upon the literally-copied body of a third, but artfully combines the whole into the appearance of one by the exercise of his anatomical and artistic knowledge and *imagination.* And the others are only dependent upon such miscalled models for originating in their minds the real subjects from which their pictures are produced.

The imitation therefore of such lofty flights being so perfectly unjustifiable, such ridicule as may be found in your own and contemporaries' pages, more especially in publications connected with or devoted to art, must naturally be expected. Who can soar after the birds of nature with wings constructed by the aid of scissors and paste without ludicrously tumbling to the ground? I do not look upon the greatest ingenuity or skill as at all palliative of the practice—the more artfully concealed the more mischievous the result, because the thing is then more likely to be looked upon by the uninitiated as genuine, when the art itself suffers; and an operator who displays such capabilities ought to know better, or, knowing better, he sins against his conscience. I know there are many who have never before viewed the matter in this light —who looked upon photographs as photographs merely, and pictures as pictures, without contemplating the possible connexion of the two, and who therefore wink at that in a photograph which they would at once denounce in a drawing; but it is not to the advantage of photography that this is so.

The composition of *genre* pieces does not necessarily imply the cutting out and patching which I venture to condemn; and most decidedly do I decline subscribing to the opinion that the only "difference between composing a subject and taking it on one plate, and taking portions of the subject on separate plates and combining them subsequently," is "that the latter is the more troublesome method, and produces *better* results." A good enlarging process, and a lens commanding a wide angle of view, with clever models, and judiciously chosen accessories, are the right tools for photographic composition pieces, *but not the scissors and paste pot!*

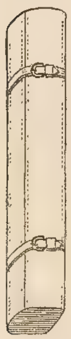
Photography's legitimate mission is, truly, a great and glorious one. As a scientific agent its aid is already acknowledged to be invaluable; and in all such branches of the fine arts as, strictly speaking, are imitative, it may yet take a most honourable and distinguished position. Although I use the word imitative in its strictest sense, I believe that most of the qualities claimed as "imaginative" belong clearly to imitation; for there is that poetry and beauty in nature which, whether transcribed by brush or camera, will be found in pictures in exact ratio with their truthfulness. It would lengthen a communication which is already too long to define this more thoroughly, so I at once conclude.

MOGINIE'S NEW PORTABLE TENT.

As the season has now fairly set in when photographers may be expected to take the field, and having devoted some amount of space and attention to those who follow the dry processes, we consider that the advocates of moist collodion have now a full claim to some notice. We therefore purpose describing a new portable tent for field work, which has lately been devised by Mr. Moginie, and which he has submitted to our inspection.

One of the principal objections to most of the tents already in use consists in their occupying too much time in erecting, and another in the trouble mostly experienced in getting the covering properly over the framework. Again, loose pieces are a fruitful source of disaster, either from being lost or mislaid, to say nothing of not unfrequently misfitting, in consequence of one piece being accidentally substituted for another. In the arrangement, of which we give a cut, these sources of discomfort have been provided against, the framework, cover, and stand being constructed of but few parts and no loose pieces, and a fair amount of rigidity attained by judicious triangulation of the component portions. It can be readily and rapidly erected, having been unpacked and put up in our presence in less than a couple of minutes; and by aid of four pegs and cords, which are permanently attached to the uprights, a sufficient resistance to wind is secured, provided that it be not such a gale as one during which no photographer would dream of operating.

FIG. 2.



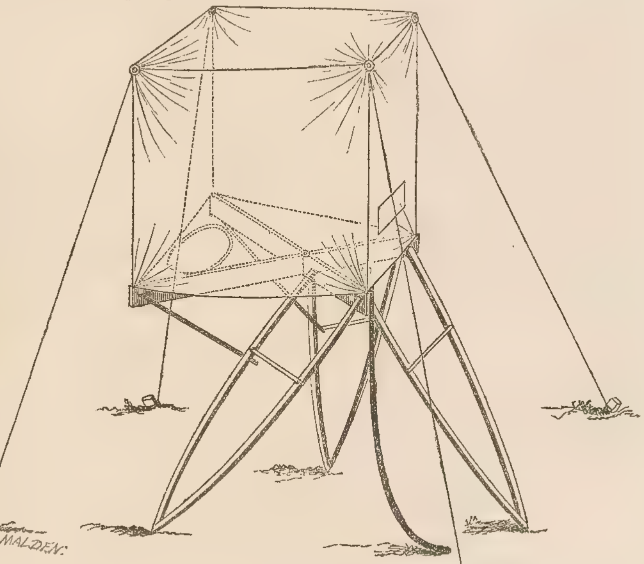


FIG. 1.

The cross-like base of the chamber, when not in use, folds quite flat, and, with the legs of the tripod and other paraphernalia, can be made into a very moderate-sized bundle (as in Fig. 2) for transport, and, as we are informed, weighs but twelve pounds—a weight considerably less than many cameras with two or three dark plate frames. The uprights of the dark chamber are contained within it, permanently attached to the several angles, and the extremities of the uprights fit into sockets at the points of the cross-piece at the base, consequently the mere act of putting up the supports also erects the tent itself. One triangular segment of the bottom of the chamber has an aperture, with elastic band, through which the operator gains admittance for the upper part of his body, light being excluded by its fitting closely round the waist. The opposite triangular segment forms a sink for the washings: it is lined with caoutchouc, and has a flexible tube to carry off the slop, &c. The working space is rather more than a yard square, but can of course be made almost of any desired size, and various conveniences are provided for suspending a small cistern for water, supporting the nitrate bath, camera frames, bottles for chemicals, and all other requisites, while an arrangement to secure ventilation without admitting light has also been attended to. All the other details are so readily gathered from mere inspection of the illustration that it is needless to particularise them further. We believe that these tents are to be seen at the establishment of several dealers in apparatus, which will no doubt be notified in advertisements.

ON THE RELATIVE SULPHURISING TENDENCY OF NEW AND OLD HYPO. BATHS.

By C. Oakeshot.

[Read at a Meeting of the North London Photographic Association, May 30, 1860.]

The following experiments, undertaken with a view of finding whether the hypo. bath by use acquires any increased tendency to sulphurisation, may, perhaps, be not altogether without interest. I give them for what they are worth, leaving it to photographers generally to consider if they have any practical bearing on the subject of a proper fixation of their prints.

A new bath was mixed—

Hyposulphite of soda ...... 2 ounces avoirdupois.
Ordinary water ....12 „ fluid.

About as many prints on albumenised paper as would be equal to half a sheet were fixed in this bath. A portion of the bath was then poured into two wine glasses, and common salt added to one. A small silver coin was placed in each glass; the glasses were removed into the strong light of the operating-room, and left there undisturbed for twenty-four hours, by which time both coins were sulphurised to a buff tint, the one in the glass containing salt being deepest in colour. The remainder of the bath was then used to fix two more batches of prints, and again tried in the same manner; but, instead of salt, some kaolin was stirred with the solution in one of the glasses. The kaolin quickly restored the hypo. to its originally clear and colourless condition. Coins left in these solutions for twenty-four hours were sulphurised to a deep brown, or rather a black tint—the one from the solution containing kaolin being deepest. A portion of a new and unused bath was then tried: the coin after remaining in this for twenty-four hours became tinted to a buff, somewhat less deep than those which had been tried in the bath used once only.

These experiments were made with ordinary materials. The hypo. was dissolved in hard water, and no care was taken to have the coins chemically clean, and therefore it was not improbable that some organic matter might be adherent to their surfaces, and influence the result. I thought it advisable to repeat the experiments with greater precautions.

Five small silver coins were left for some time in dilute nitric acid, then well washed and polished with a clean cloth.

A bath was made—

Hyposulphite of soda .... 2 ounces.
Distilled water ....12 ounces.

A portion of this was tried unused, a second portion after it had fixed one lot of prints, and a third after it had been used three times. The cleaned coins were left in these solutions for twenty four hours.

RESULTS.

Bath unused—Coins became very faintly tinted.
Once used—
1st, with salt added ....tinted to a pale buff.
2nd, without salt...............same, but lighter.
Used three times—
1st, with kaolin added...........to a decided buff.
2nd, without kaolin ....not quite so deep.

The next object was to see whether light materially assisted the sulphurisation. A portion of a bath which had been used for fixing three batches of prints was placed in a dark part of the dark room, and a shilling, well cleaned, left in it for twenty-four hours. When removed it had acquired a deep bronze colour, visibly less dark than the one which had been treated the same way but left in the light: this bath was made with ordinary water.

From these experiments I infer—1. That the hypo. bath made with distilled water becomes less discoloured by use, and also has not so ready a tendency to sulphurise as one made with ordinary water. 2. That the bath, whether made with distilled or with ordinary water, by repeated use, acquires an increasing facility of sulphurising; and, 3. That, as light appears to assist this tendency

it may perhaps be well, while the prints are in the hypo., to guard against their being exposed unnecessarily to the light.

Mr. Hardwich's experiments, in reference to the assertions of of MM. Davanne and Girard, were repeated. Thirty grains nitrate of silver were converted into chloride, and dissolved in hypo.: it required exactly fifty-three grains to take up every particle of chloride. Crystals began to form in twenty-four hours. The solution was left undisturbed for three weeks, when the bottom of the glass containing it was covered with the crystals; the supernatant liquid was then poured off into a large watch class, and placed in the light; a black scum soon formed on the surface of the liquid, and a black deposit of, I suppose, sulphide of silver began to settle to the bottom of the glass. A shilling was now dropped in and left there for twenty-four hours: it remained there for that time *without showing the slightest symptom of discolouration from sulphur*, although from the increasing black deposit it was plain the liquid was undergoing decomposition. No further crystals formed till the liquid had nearly evaporated, and when nearly dry, two or three bunches of crystals were seen on different sides of the glass *altogether different in shape* to those which had before formed. The crystals first removed when dried weighed exactly thirty grains. It took just twenty-five grains hypo. to dissolve five grains of these crystals.

My next attempt was to find the minimum of time a print might be left in the hypo. bath, in order to be properly fixed. Five portraits were vignetted. The reason for vignetting them was that the large surface of white would more readily show any trace of yellowness they might acquire in the after treatment. These prints were all toned in a gold bath, very slightly alkaline, to which was added a few grains of nitrate of soda (the latter salt appears to make the print tone more rapidly, and with greater certainty). They were fixed in a new hypo. bath, of the strength before given, made with hard water. Each print was placed in this bath separately, and the solution agitated while they were being immersed, and for three minutes afterwards.

1st	was left in	3	minutes only.
2nd	„	5	„
3rd	„	7	„
4th	„	10	„
5th	„	15	„

They were then washed in running water for sixteen hours, and when dry were all perfectly clear in the white parts; not the slightest indication of yellowness in either of them. They were then treated separately, with two pourings of boiling water.

RESULTS.

No. 1......	3	minutes in hypo	.......very yellow.	
„ 2......	5	„	...... „	but less.
„ 3......	7	„	...... „	„
„ 4......	10	„	.. ...nearly white.	
„ 5......	15	„	......quite white.	

Another bath was made with distilled water, and five more vignetted prints fixed in it. These were all cut from the same sheet of paper, but the shortest time of immersion was seven minutes.

RESULTS.

No. 1......	7	minutes in hypo	.......slightly yellow.
„ 2......	10	„	...... „
„ 3......	15	„	......quite white.
„ *4......	20	„	...... „
„ 5... ..	25	„	......a faint rendering to yellowness, very slight.

From this it appears that the time usually recommended for the prints being in the hypo., fifteen minutes, is a safe one, though they seem to suffer little injury from being left in nearly twice as long. I forward all the prints. You will observe that most of them are more or less covered with brown spots: these are owing to blisters of the albumen surface, which formed when in the toning bath.

I incline to think that any sample of paper which blisters, either in the toning or fixing bath, will be imperfectly fixed, and sooner or later must surely show indications of these brown spots. The hypo. appears to be retained between the albumen and the paper with particular tenacity, which no amount of washing will effectually remove. I have noticed the same occur with the collodio-albumen plates; those which blistered invariably showed the same kind of spots, even after the plate had been well varnished. The blisters in the paper may perhaps arise from the habit which some makers have of passing the paper, after being albumenised, through rollers, in order to give it a smooth and finished appearance.

* This was not treated with boiling water.

The paper used in these experiments was La Rue's, obtained from one of the largest London advertising houses, and unfortunately was a very indifferent sample.

I had purposed carrying out my experiments still further by fixing vignetted prints in old or rather many-times-used baths, and treating them with boiling water; but, being professionally engaged, as yet I have not been able to spare the time.

I know of no means for dissolving hypo. left in the paper which answers better than boiling water, and shall be greatly obliged if any one will point out one more delicate and certain.

I have omitted to mention that the temperature of the room at the time the prints were fixed was 65°. The hypo. bath had been mixed fully six hours before being used.

I wish further to observe, with reference to the experiments with the silver coins, that because they were deeply sulphurised after being left in the hypo. for twenty-four hours, it does not necessarily follow that the same result will happen with prints which remain in the fixing bath only a quarter of an hour; but it must be borne in mind that the deposit on the paper, from its finely divided condition, and also from the permeability of the paper allowing the hypo. to come readily in contact with every particle, may perhaps be placed in a condition to be more easily acted upon. The object was to see whether the hypo., after use, retained its original condition, or whether it acquired any greatly increased disposition to part with its sulphur. I think the experiments go to prove the latter.

ON PHOTOGRAPHY AND ITS APPLICATION TO MILITARY PURPOSES.*

By Captain Donelly, R.E.

Captain Donelly wished to guard against the supposition that might arise from the title of his paper, that he proposed to bring forward any new or remarkable application of photography to military purposes. He did not come forward as an inventor. It was not his intention to propose to defeat armies, destroy fleets, or take fortresses by the aid of nitrate of silver and the camera obscura. But he would endeavour to explain, as clearly as he could, the general principles of photography—an art which was everyday rapidly extending, and the aid of which might, he believed, be usefully enlisted in many secondary military operations.

Captain Donelly then went into a lucid detail of the scientific principles upon which the art of photography rests, occasionally illustrating his theories by experiments. One of his experiments was strikingly beautiful. In exemplifying the action of light in effecting chemical changes and combinations in certain substances, the lecturer placed a mixture of hydrogen and chlorine, contained in a glass bulb about half an inch in diameter, before the intense white light produced by burning phosphorous in oxygen gas. With this kind of light no perceptible action upon the mixture in the bulb was produced, although, as the lecturer stated, the action of the sun's rays would have instantly caused the gases to combine with explosive violence. The bulb was then exposed to the influence of the intensely bright blue flame produced by the combustion of a mixture of the vapour of bisulphide of carbon in binoxide of nitrogen, which, though only burning for a fraction of a second, caused the mixture of hydrogen and chlorine instantly to combine chemically with such energy as to burst the bulb with a sharp report, in consequence of its containing a larger portion of the violet rays of the spectrum than the light previously employed.

We have seen this experiment performed in other ways, but never more successfully. Professor Roscoe lately, at the Royal Institution, procured the combination of the mixture of hydrogen and chlorine, by burning phosphorous in oxygen, contained in a *blue glass* globe; and we mention this as conclusive evidence that the union is effected by the chemical or violet rays, as the Professor could not succeed in exploding a bulb when he employed a white or red glass globe. We have not space for Captain Donelly's very clear enunciation of the principles of the art, as they have been frequently explained in the pages of this Journal, and as they may be studied in the published handbooks upon photography, such as Hardwich's, to which Captain Donelly especially referred his audience.

The lecturer then said, with reference to the application of photography to military purposes, the first necessary was portability in the apparatus. Captain Fowke, of the Royal Engineers, who had fitted out most of the parties of engineers who had taken photographic apparatus with them, invented a form of camera which was extremely portable, and could be carried in a knapsack. Captain Donelly ex-

* A lecture delivered at the United Service Institution, London, on Friday, June 8, 1860.

hibited the camera, and explained its folding arrangements; that, with the chemical boxes, was carried on pack saddles. Numerous photographs had been taken by parties of sappers, many of which Captain Donelly exhibited. Among them were some by Corporal Lawson, who was with Captains Gordon and James, on the Asiatic boundary, surveying in Asia Minor, between Russia and Turkey. Others by Sergeant Church, who accompanied Colonel Stanton, when he went to verify the reports on the projected line of railway across the Isthmus of Panama—the Honduras line. Some were taken in India, at Singapore, and others, executed in China, furnished Mr. Burford with the materials for his panorama. Some were taken by Sergeant Mack, at Moscow, when he accompanied Lord Granville. Two were taken at Varna, and, unfortunately, the photographers who went out to the Crimea were lost on board the "Prince." One photograph exhibited the plan of the ships in the order of landing the troops. Hence they saw that photography could be applied under very difficult circumstances, such as on long and rapid journeys.

The men of the Engineer's corps were taught the art, and specimens of their productions were on the table. Many of the photographs, Captain Donelly remarked, were not such as Mr. Fenton or Mr. Thurston Thompson would care to exhibit at the photographic exhibition; still some of them were very good, and all of them very creditable, when the circumstances were considered under which they were taken. Photographs of a country gave a most truthful and accurate idea of it. They would do more to give an accurate idea of any particular position than yards of description on foolscap. They might be found of great service in illustrating a report on a country—and, indeed, they had been so employed by Colonel Stanton—and in that way they might be of great service to the general commanding an army in the field, as also in copying and multiplying plans, as in the case of the plan of the position of the ships for landing the troops in the Crimea. Captain Donelly also exhibited a number of photographs taken at Chatham, showing the admirable means which they afforded of conveying descriptions of various military operations, such as bridge making, &c., so giving a perfect idea of a place. Photographs were of great service in supplying engineers with ready and rapid means of showing the state of works on any particular day. Captain Donelly exhibited a progress plan of the works at Aldershott which was done by the War Department, by which it could be seen at once how far the works had proceeded, which could only otherwise be done by expensive lithographs, and then not so well or so rapidly. They were enabled to obtain a picture of any size they wished; and Captain Donelly said that he could not give a better example of that than by referring to five photographs of one of the Cartoons in Hampton Court *(Elymas the Sorcerer Struck with Blindness)*, the photographs being of the respective sizes of 8 by 5, 15 by 11, 23 by 15, 31 by 21, and 48 by 30 inches. It might be said that these had little to do with the application of photography to military purposes. Captain Donelly exhibited them as admirable specimens of photography executed, with the assistance of men of the Royal Engineers, by Mr. Thurston Thompson, who had instructed most of the men at the South Kensington Museum. Captain Donelly called attention to some specimens of photographic reductions of the maps of the Ordnance Survey from one scale to another for engraving. By employing photography for these reductions the Survey Office at Southampton saved £1600 per annum, and the whole saving of the survey would be about £32,000, this saving being accompanied by increased rapidity and accuracy in the reductions. Formerly the reductions were made by the pentagraph, the operation being long and tedious, in which, as the hand and the eyes were employed, the accuracy was dependent, to a great extent, on the skill of the operator. Now, by merely fixing the camera at different distances from the plan to be copied, it could be reduced to any scale desired by an operation in a few minutes, and with the greatest accuracy.

The scales of the maps were for—

Towns............	$\frac{1}{500}$ or 10.56	feet	to 1 mile.
Parishes	$\frac{1}{2500}$ or 25.344	inches	„
Counties	6	„	„
Kingdom	1	„	„

The ten feet scale was reduced to the twenty-five inches, and the twenty-five inches to the six inches. But by further reduction the perfect truthfulness of photography rather militated against it. In reducing from the six to the one inch scale the photograph was too crowded with details, so that at present in a portion of that operation the pentagraph had still to be employed.

The photographs were at once transferred to the copperplates for the engraver, or the zinc plate for the zincograph process, by the following means:—Printer's tracing paper was employed, the paper being sensitised by being washed over with a saturated solution of bichromate of potash and gum water. That prepared paper was exposed to light under an ordinary glass negative, and the portion of bichromate of potash acted on became insoluble in water (that being a peculiar property of bichromate of potash). The print was then placed, face downwards, on a metal plate, covered with the greasy lithographic ink, and passed through a press until it became almost black in appearance. It was then washed with a solution of gum arabic and hot water, and brushed with a camel's hair brush, which removed the portions not acted upon, thus leaving a print in light brown colour in lithographic ink. That could be either transferred to the copperplate, as a guide to the engraver, by burnishing, or it might in the same way be transferred to the zinc plate, and printed from immediately, without any further process, by simply being inked.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

NOTICE TO MEMBERS.

The *soirée* to be held on the occasion of this Society's Anniversary Meeting, on the 21st instant, at St. Peter's School Rooms, Walworth Road, will commence at *seven o'clock precisely*, when the annual report will be brought forward; after the reading of which the members will proceed to elect officers for the ensuing year, and elect new members. Gentlemen desirous of being nominated for election as office-bearers will please to forward their names to the present Secretary, Mr. Wall, 90, Cannon Street West, City.

Several gentlemen residing in the country having sent their names (and addresses) for election as members, others similarly situated may be glad to know that this Journal, as the Society's recognised organ, will be forwarded, post free, to all such members, and that any distribution of photographs which may be made during the next year will not be performed without due recognition of their rights. Communications from provincial members of this Society will be brought forward for discussion, &c., at the usual meetings; and, in short, it is expected that this arrangement may be made the medium of many little interchanges of services mutually advantageous to all concerned.

ALFRED H. WALL, *Hon. Sec.*

EXCHANGE CLUB,

(In connexion with the South London Photographic Society).

The first exchange of photographs will take place early in July, and those desirous of becoming members in time to avail themselves thereof are requested to intimate the same to me during the current month, forwarding prints, unmounted, offered for exchange (together with one copy of each as a contribution to the Society's portfolio), with a notification as to the class of photographs desired in return.

Each member should send stamps sufficient to cover all postage in his individual case.

MICHAEL HANNAFORD, *Hon. Sec.*

6, *South Grove West, Mildmay Park,*
Stoke Newington, N.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary general meeting of this Society was held on Tuesday, the 5th instant,—P. Le Neve Foster, Esq., V.P., in the chair.

The Secretary read a letter from Mr. Denyer, photographic artist, of St. Petersburgh.

The object of the letter was to make the writer known in this country, and expressive of a desire to become an honorary member of the Photographic Society. It was accompanied by two *very* large portraits, artistically executed, but possessing all the defects inherent in specimens taken by lenses of very large aperture, viz., want of distinctness and atmosphere, the figures appearing flattened. In point of execution, apart from the defects produced by the lens, the proofs were all that could be desired. A vote of thanks was awarded to Mr. Denyer.

The Secretary read a letter from Capt. Biggs, of the Bombay Artillery. Four large-sized photographs of Indian subjects, from the neighbourhood of Bombay, upon plain paper, printed by the ammonio-nitrate of silver process, accompanied the letter. They were very clean and good. They were from paper negatives by the original Talbotype process, taken upon Turner's paper. The proofs were printed upon Marion's positive paper.

The letter related chiefly to the difficulties experienced by photographers in the Bombay Presidency, partly from the nature of the climate—the foliage never being in repose, necessitating the exposure being made before the breeze sets in, which is usually about nine A.M.—and partly from the enormous extra cost of chemicals, and their inferiority to English chemicals, the cost being three to four hundred per cent. higher. The thanks of the Society were voted to Capt. Biggs.

Mr. Dallmeyer then read a paper *On Distortion as Produced by the Existing Forms of View Lenses, &c.*, which we do not insert for reasons elsewhere given.

Mr. Malone asked how many surfaces there were in the altered portrait lens.

Mr. Dallmeyer, in reply, said six.

Mr. Shadbolt asked what was the *equivalent* focal length.

Mr. Dallmeyer said about twelve inches, being about the same as those supplied by his late father-in-law for the last four years. The aperture of the front combination was three and a quarter inches, and that of the back combination three and a-half inches, which gave great equality of illumination over the whole extent of plate, otherwise there was no material difference in time of exposure. He said that he had not adopted the most elegant manner of proving his position, but had availed himself of a familiar means of illustrating the angles of distortion. He stated that the form of the front combination, as left by his late father-in-law, did not admit of its being used as a single combination. He (Mr. Dallmeyer) had so constructed the front combination of *his* portrait lens, that on removing entirely the back combination this might be screwed into its place, and then be employed as an ordinary view lens.

The Chairman having invited discussion,

Mr. Shadbolt said he was not a little disappointed in finding a total absence of novelty in that which was brought forward as such, inasmuch as he had in his possession a lens, made by the late Mr. Archer, that comprised nearly all, if not absolutely all, the principles involved in the one described by Mr. Dallmeyer. His memory was bad as to dates, but he could vouch for his possession of this lens for upwards of seven years, but whether he had possessed it eight or nine years he could not recollect. He had resided in the house which he now occupied for seven years on the 3rd of last March, and he took Mr. Archer's lens into the house when he first went to it, consequently he was clear upon that point. The front lens fitted the back of the mounting, and was the lens which he commonly uses as a landscape lens, and a better landscape lens he had never yet seen of any one's manufacture. As a double combination lens it was constructed according to the ordinary form, after the formula of Professor Petzval, the late Mr. Ross, and the present Mr. Ross—that is to say, the front being a cemented compound, and the back being a separated compound; but, in addition to that, the diaphragms were placed between the lenses at a distance corresponding to the respective foci of the combinations of the lenses, that is, being somewhat nearer to the front lens, which was of shorter focus than the back, and it is the position of the diaphragm which avoids the production of distortion, and the introduction of a small concave at that spot which, he conceived, lengthened out the focus, precisely in the manner Mr. Dallmeyer had described. Now that was an addition to the arrangement which was made subsequently to the construction of the lens. It was not added by Mr. Archer but by himself, from hints given to him by Mr. Archer; and he could vouch for the fact of those hints having been given to him five years ago, if not six. Mr. Archer was then using, for landscape work, a lens constructed precisely similar to the one he (Mr. Shadbolt) was then using. Mr. Archer showed him that lens; and one particular point in connexion with its use was the advantages he found in taking interiors where crowded for space and wishing to get a considerable angle. But he thought Mr. Dallmeyer had a little slurred over the fact, that in order to get freedom from distortion he must sacrifice something—possibly a certain portion of flatness of field. He had not described the mode in which he had altered the ordinary portrait lens, but, from what he had stated, he presumed Mr. Dallmeyer used a back and front combination of identical focus, with a concave lens between them; in point of fact, taking up just what Mr. Sutton had alleged as being his symmetrical triplet. At the time when that triplet was brought forward, he (Mr. Shadbolt) pointed out the facts to which he was now alluding, and consequently alleged that there was not the novelty that was supposed to exist in the lens. He was not aware that Mr. Archer did very publicly bring forward that lens, but that he made and sold several of them he did know, both from Mr. Archer himself and from his late wife. He (Mr. Shadbolt) saw several of them in his possession at the time that he first of all showed him the mode in which he (Mr. Archer) was then working. Not being aware of any public statement of the fact by Mr. Archer, it is probable that neither Mr. Sutton nor Mr. Dallmeyer had heard of it; but certainly at the time that Herr Paul Pretsch introduced Petzval's orthographic lens he (Mr. Shadbolt) did publish a statement to that effect. He believed that about two years ago—certainly eighteen months ago—he pointed it out, and, subsequently, when the so-called Lens-Committee of the Scotch Society issued a very droll report upon lenses, he pointed out the fact that they assumed to have discovered something extraordinary—that the position of the diaphragm in front of a lens produced the barrel-shaped image, and the diaphragm, when placed behind, produced the hourglass shaped image of a square original. That was not novel to him, and he did not presume that it was novel to many others; yet still that fact was pointed out at both the times specified. It had been frequently remarked, that in optical instruments they very rarely could get an advance in one direction without a sacrifice in another. If Mr. Dallmeyer could assure the Society that the alteration which he had made in the portrait lens did not sacrifice anything, either in definition or curvature of field, then he presumed Mr. Dallmeyer's must be considered as an advance in the construction of the lens. Unless Mr. Dallmeyer could show that he had sacrificed nothing, he was afraid they were where they were before, except that they were simply substituting one error for another. He (Mr. Shadbolt) stated his object to be for no other purpose than simply to draw as much out of Mr. Dallmeyer for public information as could possibly be obtained.

Mr. Malone confessed his ignorance of the exact proofs of the theory of optics. Of course he should not pretend to enter into any philosophical discussion of the subject. He regretted there were not more gentlemen of Mr. Shadbolt's degree of attainments. He (Mr. Malone) thought he might be allowed to mention that it had always been a great object with him that the late Mr. Ross should have been attached to the Society in a permanent manner. His suggestion was overruled, and it was said that he was so connected with trade that it would not be well to place him on the council. He regretted that sort of feeling to this day. He could not, of course, but welcome Mr. Dallmeyer's presence at the meeting. Mr. Malone then stated that, having made these introductory remarks, he must say that it certainly was very clear, as Mr. Dallmeyer had said, that photographers generally, not having that intimate knowledge of this subject to enable them to know sufficiently what to expect from a lens, it was only by trying it that they got any idea at all about it other than that which they got from the makers and sellers of lenses, and that which was occasionally written upon the subject. They were much perplexed. They knew that it was the business of the maker of the lens to make the best of his invention. In trying to disparage a lens, care must be taken that it be done with judgment; and, without taking upon himself to be a general censor, he would just point out how it appeared to him members occasionally erred. The late Mr. Ross had a strong opinion, speaking generally, that those writers and gentlemen who took part in optical discussions had what is called the school knowledge, which might be sufficient to enable them to take some part in a discussion, and to understand the nature of improvements suggested, but hardly justified them in giving to an optician in full detail the plan of procedure by which he should make a good lens of new form. Now this was the case: they had a suggestion made by a person only partially competent; and then they wanted such a practical man as Mr. Ross or Mr. Dallmeyer to work it out for them, which, of course, they did not want to do, for it involved a great amount of labour—ideas coming fast, they had all the past to correct. In addressing himself to the subject as a photographer, and speaking as a practical photographer who had handled many lenses, his impression was that members ought to hail and welcome cordially any attempt to produce a lens that will give straighter lines—if without loss of flatness of field or definition so much the better. Let them take any invention offered to them, and look well, calmly, and dispassionately to see whether there were any advantages of which they could avail themselves. He hailed with joy the introduction of the orthographic lens, and he had expected to get better results than he found, for they had been told it gave straight lines. Now there was a fallacy involved in that. For instance, if a picture with a gateway were examined, the lines of the gateway would appear to be straight, because they did not fill the whole of the picture. But the lines were not straight: it was only a kind of artifice. There was no doubt that the orthographic or orthoscopic lens would be a better lens than the old form of view lens, but it was seen at once that there were many things to discriminate. They found that in taking a view of a street with the corner of another street running into the picture, then that corner would represent that line curved; and if that corner of the street ran into the whole picture, they would, by the orthographic lens, have the buildings appear to be about to tumble over into the street, or to tumble out at the bottom—in neither of which cases would it be natural—and then they would probably prefer the old form of view lens. Photographers could not get rid of the necessity for the old form of view lens; and it appeared to him that, on starting, they must take the old form of view lens, whether single or double, which gave the barrel-shaped distortion, or the orthographic, which gave the pincushion shape; and, if all that had been said at the meeting were true, they would have to add this third lens. Mr. Dallmeyer had said that his portrait lens, in which he had lessened the distortion, might be taken in half, and one half used as a view lens. The reason he gave for that did not satisfy him (Mr. Malone). Mr. Dallmeyer had said that, in dealing with buildings with a view lens, they got that barrel-shaped distortion; but he said, if they took a landscape in which there were no buildings, then that distortion was of no consequence. He thought it was of essential importance, and he would give an instance where it would be detected. If this single combination were taken to avoid any loss by diffraction in consequence of the number of reflecting surfaces, or want of flatness of field, and a picture were taken containing trees, which in nature were absolutely straight, and it was wished to produce them in the picture as they absolutely appeared, then they must go back to the old lens, and have the trees of a barrelled shape. He knew it would be said, Who knew that they were barrelled? He wanted photographers to guard against that. Let members look at the three diagrams and say which they would prefer. He (Mr. Malone) thought they must sacrifice a little definition if they could get straight lines. The result is that photographers will find all these lenses useful, and perhaps a fourth, for he was bold enough to think that they ought to have a very large double portrait combination for certain purposes, to meet every possible case, and to do the best under any circumstances.

Mr. Bedford said certainly the objections that Mr. Malone made to the peculiarity of these lenses prevailed to a great degree. He (Mr. Bedford) had had a sea line curved up and down, he had had larch trees and fir trees bent in all ways, and he thought it was necessary, in order to be prepared for all kinds of work, to take all the lenses that are made. He (Mr. Bedford) took a portrait lens of Ross's—the one known as the £25 lens—which he found very useful for dark subjects, in glens and interiors, and

such subjects as those; the orthographic for flat architectural views; and the old Ross view lens—than which there was nothing better—for landscapes, as giving greater depth of view and better average perfection than any other lens. He (Mr. Bedford) was quite certain that the orthographic was not an improvement for landscapes, although very useful and almost indispensable in certain exceptional cases. He should have liked to have seen specimens of productions of Mr. Dallmeyer's lens upon larger plates. The lines seemed straight, but even in that small surface there was a very sensible falling off in the sharpness of the picture, and particularly that of *The Times:* small as it was the outside lines were not only out of focus but blurred. He did not know what the lens had been when worked under all its advantages.

Mr. Hardwich said he had lately been attempting to copy maps and pictures of a large size, and had been struck with the necessity of not too much lessening the aperture of the lens. He took an interest in the symmetrical triplet lens, or in any lens which promised an image free from distortion, and he would wish to inquire what the chances were of getting such a lens to cover a plate two feet square, and to work within a reasonable time? Would the number of reflecting surfaces be so great as to occasion a serious difficulty in producing intensity? He supposed that it was in copying maps particularly that the triplet would be used. Could it be so used without cutting off too much light? He would also ask of gentlemen who had used Petzval's orthoscopic or orthographic lens on very large plates, how far the distortion became a serious matter? because only the day of the meeting he had been measuring very carefully on a plate twenty-two inches square, by fastening strings across a board, and taking the exact distances between those strings. Unfortunately he was prevented finishing his experiments, but when he came away he had not succeeded in satisfying himself that there was any material distortion. He (Mr. Hardwich) remembered a conversation he had with the late Mr. Howlett at the time the orthoscopic was first made, and that gentleman said the error was so small that he might practically disregard it: whereas with his old form of lens, the lines of a map taken piecemeal would not meet, with his orthoscopic the lines did meet. The result of much that he had since heard was different. He confessed, from his experiment, he was astonished to find how small was the distortion. The focal length of his lens was four feet two inches. He had been engaged in trying to find an easy method of getting up the intensity of negatives taken with long focus lenses. What he wished to do was to get rid of the bichloride of mercury. He believed they ought to discard the use of bichloride of mercury, for it was deleterious in its results, and, from what he had read lately, he believed it was difficult to get it off the plate again. He hoped that the optical part of the question was not concluded, for there were many readers of the Journal who wished for all the information it could give.

Mr. Malone thought it would not be out of place if he rose again to speak of an experiment which was pertinent to Mr. Hardwich's inquiry. He made the experiment in conjunction with Mr. Ronalds, the director of the Kew Observatory, and assisted him in carrying out the photographic registration there. Mr. Ronalds was extremely anxious to know whether he could rely upon photographic results as to division and so on. There was a certain normal line, and it became very important to ascertain the power of lenses with regard to this. Mr. Ronalds drew a square foot on paper with square inches with the greatest accuracy, and asked him if he could copy that of the exact size with the spaces true. Many experiments were made, and at last he succeeded in making a copy, which he believed he retained now, of the exact size of the diagram—a foot square, divided into square inches, painted black and white. Mr. Ronalds measured the copy with square and rule, and expressed himself satisfied with the result. He was surprised at getting so exact a *fac-simile*. The lens was made by Mr. Slater: it was a lens to take large portraits, of some four or five inches aperture, and it could be used either as two lenses together or as one, or there was a third lens put in to shorten the focus. The third lens was a greenish glass, and very slow for portraits; but tried in that way, with a stop which he believed was an inch, he got that result, and his impression was that he could not have done it with any other form of lens. He added that the late Mr. Ross impressed upon him the necessity, when asking what sized plate a particular lens would cover, of explaining the object in view: thus, if about to copy a map, so that the lines should meet exactly, they ought to go to the expense of a large lens with a long focus, and the result would be that they would get a portion out of the centre of the field which would appear to be nearly a straight line, but that of course involved expense. He had great hopes of Mr. Dallmeyer's lens.

Mr. Dallmeyer said he would explain the reason of his bringing the paper forward. It was owing to the fact of his being continually asked what lens was free from distortion, which led him to conceive the subject was not sufficiently well understood by most photographers, and it was for those that he had written the paper. He had purposely abstained from giving formulæ, for what he could give might be found in the works on optics to which he had alluded; and gentlemen, on seeing formulæ in a paper, often made the remark, that not being mathematicians they did not interest them. He had, consequently, simply exhibited the diagram. With reference to novelty, *he claimed none.* The lens was free from distortion as far as that was obtainable, for he might state that no lens could be made to project an image on a flat screen absolutely free from distortion. The nearest approximation possible required the lens to be of the same diameter as the picture produced, which he had stated was too expensive a matter to consider. Hence it was necessary to ascertain how far he could approach to the production of an image which was free from distortion; and it was both by form and focal length of the combinations that the distortions due to the displacement of the lateral pencils, as occasioned by the first combination, were corrected by the opposite nature of the distortions of the second combination, as was exhibited in the diagram; but the remaining distortions, as occasioned by the difference of the focal lengths, so to speak, of the central and marginal pencils, when the image was required to be projected on a flat screen, would remain, and could not be corrected unless the flat screen be exchanged for a curved one. Therefore it was desirable to arrive at the nearest approximation; and it would be found that the distortion due to the difference of focal length of central and lateral pencils presented but a small fraction as compared to that occasioned by the difference of the refracting angles of the lens, as shown in the diagram; and therefore he had neglected that distortion, and merely paid attention to the distortions he had previously alluded to. He would correct a mistake: his lens, when employed for architectural views, did not consist of two positive combinations with a negative lens between them, but of *two positive combinations only;* the number of reflecting surfaces therefore was six and not eight, as in Mr. Shadbolt's combination, and as such it was employed for views. He had already stated that the number of reflecting surfaces in lenses, where of necessity a small aperture was employed, was a great objection on account of the loss of light; and hence persons have found that with the orthographic lens the time of exposure, as compared with the ordinary view lens, was greater—perhaps double. With regard to lenses for copying, it was readily understood from what he had stated that the amount of distortion depended on the focal length of the lens: the longer the focal length the less the amount of distortion. He would beg to say that, perhaps, what was considered by Mr. Hardwich to be a chemical difficulty, might perhaps be due to an optical deficiency, and due to aberration from *diffraction;* for, if the amount of confusion produced by this aberration were taken into account for a lens of long focal length with a very small diaphragm, it might be that the confusion spoken of by Mr. Hardwich was due to that. He just threw that out as a hint, perhaps, to be inquired into, so as not to be misled in the *rationale* which he might form of the subject. With regard to a number of lenses being requisite at different times, that was one of the reasons why he had made his portrait lens subservient to different purposes—not that he wished to say, use the front lens alone, since the focal length of the front combination was different to the focal length of the two when combined. There might be at times a desire to produce pictures of different sizes; hence he had utilised his front combination, so that it might be employed to that end. With regard to the observations of Mr. Shadbolt, and his inquiry whether other important qualities were sacrificed to the obtaining the one sought after, namely, freedom from distortion and flatness of field, he had brought with him the pictures exhibited, by which he thought he had afforded the best means of judging as to its merits as a portrait lens. He had given its equivalent focal length and diameter, which expressed its rapidity of action; and, in regard to any sacrifice being made to give the lens the properties described, he believed there was no sacrifice of material consequence. With regard to the exposure given in obtaining the views exhibited, that was written on each plate. In answer to the remarks made as to the copy of *The Times*, he ought to have stated, on placing it on the table, that it was taken with an aperture of one and a-half inches, which was at least three times larger than that always employed for copying purposes; consequently, the remarks did not fairly apply. He (Mr. Dallmeyer) would be happy to answer any further questions.

The Chairman, in tendering the thanks of the Society to Mr. Dallmeyer, stated that the subject was most interesting to photographers, although he feared that among photographers generally there were not many who had gone deeply into optics, for he had generally found that when optical subjects had been brought before the Society there were very few who rose to discuss them. He thought it would lead to improvement if photographers would give more attention to the study of optics. He wished the members a pleasant and a happy vacation, and adjourned the meeting until the first Tuesday in November next.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of the Association was held at Myddelton Hall, Islington, on Wednesday, the 30th ultimo,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. Hill called the attention of the meeting to two samples of thick glass which he had been using in the printing frame. One was of a cerulean blue, the other of the usual green tint, and contrary to the general opinion that the blue would not only allow printing to be performed more quickly, but permit better tones, he found the green exhibited a decided advantage, although it had been in use more than two years. He exhibited slips of paper demonstrating these facts.

Mr. Dawson observed that it was not generally supposed that blue glass allowed more rapid action than colourless glass, but was considered

preferable to that having a greenish tint, and colourless glass was found to change.

Mr. Barber said that colourless glass ought not to arrest any of the rays.

The Chairman reminded him that a solution of di-sulphate of quinine, though absolutely colourless, arrested the whole of the actinic rays.

Mr. Barber said that with the quinine solution, though colourless itself, a blue colour is seen on looking along the surface.

The Chairman assented, and pointed out that, according to the theory of Professor Stokes, the blue colour was owing to the previously invisible actinic rays being stopped by the quinine solution, and thus rendered visible.

Mr. T. A. Barber read a paper from Mr. Oakeshot, of Ryde, *On the Relative Sulphurising Tendency of New and Old Hypo. Baths.* [See page 177.]

Specimens in illustration of the paper were also exhibited.

The thanks of the meeting were given to Mr. Oakeshot for his interesting communication.

The Chairman said that, as Mr. George Dawson's paper would embrace the same subjects as those treated of by Mr. Oakeshot, he thought it better to call upon Mr. Dawson to read his paper, and take the discussion on both together.

Mr. George Dawson then read a paper *On the Mutual Reaction of Chloride of Silver and Hyposulphite of Soda, and an Inquiry into the Cause of the "Measly Spots" in Positive Proofs.* [See page 174.]

Specimens of the various products were exhibited by Mr. Dawson—viz., the solution of pure chloride of sodium from the hyposulphite of soda; hyposulphite of silver, pure and white, which had been kept for three weeks excluded from light, air, and moisture; also specimens of the same in several stages of decomposition, owing to the influence of one or more of the above-mentioned destructive agents. The curious crystalline compound, or probably agglomerated mixture, arising from the addition of chloride of silver, in bulk, to hyposulphite of soda, was submitted to the meeting, and some specimens of albumen (pieces of the white of an egg) which had been treated first with nitrate of silver and subsequently with hyposulphite of soda. These, on being cut transversely, were very instructive, clearly displaying the fact that the nitrate of silver penetrated to a much greater depth than the hyposulphite, showing several distinct strata of action between perfect removal of the silver salt, partial decomposition, and total inaction. One of the "measly" proofs sent by Mr. Barnett to the previous meeting was shown by Mr. Dawson, denuded of its surface, and showing the "measly" spots *in situ*.

At the conclusion of the paper, the thanks of the meeting were so warmly volunteered, that the Chairman remarked that it was manifestly unnecessary to put it to the vote whether they should be accorded. He thought the papers just read would afford ample discussion to last until past midnight, and he should be glad to hear what the members had to say on so engrossing a subject.

Mr. G. W. Simpson was of opinion that Mr. Dawson had treated the subject in so elaborate and conclusive a manner, illustrated, as it had been, with such demonstrable results, that there was scarcely room for discussion, in which opinion he was supported by the majority of the members.

The Chairman said there were several points of considerable interest brought forward in the two papers which had been read. First of all, in Mr. Oakeshot's paper it was stated that the conditions requisite for discoloration of the silver coins were only present after a *very long* exposure to the action of the hyposulphite; and Mr. Dawson, who had treated of the "measly" effects produced, had most satisfactorily shown the actual condition of the substances formed.

Mr. Barber said the print which had been sent up by Mr. Oakeshot, and in which there were spots, had been fixed with cyanide of potassium, and not with hypo. at all.

The Chairman said the spots were not "measly" ones, but caused by the cyanide of potassium effecting a partial solution in the size of the paper. On putting the print into water these spots would instantly become perfectly transparent.

Mr. Dawson, in reply to the Chairman, said that "measly" spots were always produced in a very weak solution. One specimen of the paper he had exhibited was about six years old.

The Chairman said he should like to know if the difference between albumenised paper coagulated by heat or otherwise and that which had not been coagulated had ever been tried.

Mr. Dawson said the specimen shown had been coagulated; for some years ago he always did coagulate his albumen.

The Chairman said Mr. Dawson had spoken of having thrown down sub-chloride of silver, which certain gentlemen had stated did not exist. Was any test applied?

Mr. Dawson observed that it could only be that, or sulphide of silver, or hyposulphite of silver, but it was neither of the latter, as proved by the tests he applied.

The Chairman remarked that stale albumen was used by some manufacturers. One day, on entering the room of a person who prepared albumenised paper in large quantities, he perceived an unpleasant odour, and was told that they could not work the albumen unless they used stale eggs for the purpose, though of course this was an error.

Mr. Hill said he never had a "measly" print, which was probably owing to his employing a strong solution of hypo. He used Saxe paper, and sometimes there was a small spot like grease in the centre, which blackened in the light on drying.

Mr. Barber observed, that when Mr. Oakeshot was in town he showed him some prints in which, upon the albumenised paper, there was a kind of bluish "blur," which he attributed to putting the paper between steel rollers. He (Mr. Barber), however, had never any "measly" pictures himself.

The Chairman could add evidence of having produced "measly" pictures, some purposely; and he had arrived, by inductive reasoning, at the same conclusion as Mr. Dawson had done by direct experiment. When in an acid toning bath, if the print were removed suddenly, without washing, to the solution of hyposulphite of soda, it frequently produced these "measly" appearances. By passing between steel rollers, under very great pressure, the fabric of the paper was much compressed, and might readily have blisters formed.

Mr. Simpson remarked that, in place of passing the albumenised paper between steel, if passed between copper rollers the particles adhering to it would cause bad results to be produced. He had met with "measly" prints arising from the blistering of the paper. This was always in the case of Rive paper.

Mr. Dawson had never found any "measled" from that cause.

The Chairman said, with regard to measly spots, he had always been able to produce them on all papers that he had used, by *floating* the picture to be fixed *on* the hypo. solution, instead of immersing it.

Mr. Dawson said the measles could be produced on any quality of paper, provided the hypo. did not exceed ten per cent. in the fixing solution.

Mr. Hill remarked that the valuable communications recently received proved very satisfactorily the advantage of recording failures.

Mr. Barber exhibited two bottles of solution — one clear and colourless, containing a solution of cyanide of potassium, in which a slip of silver foil was entirely dissolved; the other a solution of hyposulphite of soda, with a similar strip of silver, but, partially dissolved, the colour of this solution was of the same dirty brown as the measly spots so often referred to, and evidently showed that, while the hypo. dissolved the silver, it at the same time set up decomposition in the compound almost contemporaneously with its formation.

Mr. Legg exhibited a negative on a collodio-albumen plate that had been kept eight months before exposure.

The Chairman exhibited two by Fothergill's process, which had been sensitised on the 19th June, 1859, and exposed respectively on the 3rd and 8th May in the present year. There was a minute single spot on one plate; the other was perfectly free from spots or stains of any kind.

Mr. Hill said the plates appeared as good as new.

The Chairman said it was, at all events, evidence to prove it to be possible, if the right means were taken, to keep the plates without being deteriorated—at any rate, for a considerable length of time. He did not, however, recommend the keeping longer than necessary under any circumstances.

Mr. Moginie's tent was erected in the room, and obtained a considerable share of attention. [For description, see page 177.]

The meeting then adjourned for the recess.

The next meeting of members will be held on Wednesday, Sept. 26.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 6th instant, at the Rooms of the Literary and Philosophical Society, Mr. W. T. Mabley in the chair.

The Secretary read a circular which had been received from the Literary and Philosophical Society, inviting the Society to join them in sending a deputation to Oxford, to co-operate with the other societies of Manchester, in inviting the British Association for the Advancement of Science to hold their meeting for 1861 at Manchester. The Secretary then read a resolution, which had been passed that evening by the Council, appointing Mr. Samuel Cottam, who would be in Oxford at the time, to represent the Manchester Photographic Society, and to join the other societies in the invitation to the British Association to come to Manchester in 1861.

Mr. William Hooper was unanimously elected a member of this Society.

The Secretary laid on the table two large and beautiful prints, taken by the collodio-albumen process, by Mr. H. Petschler, and presented by him to the Society's portfolio. A vote of thanks was passed by the meeting to Mr. Petschler for his contribution.

Some very interesting discussions took place on various subjects.

The Chairman said he had, during the last week, been to the south of England, and had taken some of Dr. Hill Norris's plates, which had turned out very satisfactory; he had not, however, yet printed from them, and would not say the negatives were without defect. He found the fixing reduced the intensity very much, and seemed to take away the half tones, but he thought this might be avoided by carrying the development further. The Chairman further said Dr. Hill Norris's plates required about twice the exposure necessary for the Taupenot process.

Mr. Hooper gave some explanation of a turpentine waxed-paper process, as practised by him, and with which he had been very successful.

After a general discussion upon this subject,

The HONORARY SECRETARY called the attention of the members to the subject of the proposed Exchange Club. He had now fifteen names down on the list, and it was thought they would be quite sufficient to commence with. The following regulations for carrying out the arrangements of the Exchange Club were agreed to:—

1. That the whole of the members of the club should form and be the committee to carry out the arrangements.

2. Specimen prints, for selection, to be sent by the members of the Club to the Secretary of the Manchester Photographic Society, on or before the meeting held on the first Wednesday in July next.

3. The decision as to the admission of prints for the purpose of exchange to be made at the ordinary meetings of the Society in August next.

4. The required number of prints for distribution to be sent to the Secretary unmounted, on or before the October meeting.

After passing a vote of thanks to the Chairman, the proceedings terminated.

OBITUARY.—It is with considerable regret that we record the decease, on the 29th ult., of Mr. Samuel Buckle, late of Leamington, and formerly of Peterborough, at the age of 51. Though not engaged in photographic pursuits for some time prior to his death, his former connexion with our art demands notice at our hands. He was a clever manipulator with the original Talbotype process; and his productions at the period of the Great Exhibition in 1851 stood prominently forward, and contributed by their excellence to induce photographers to unite in forming the Photographic Society. His selection and treatment of subjects were judicious and artistic; though he confined himself principally to a moderate size (generally 9 inches by 7 inches). For some cause with which we are not acquainted, he made no attempt to advance with the times as far as the production of negatives was concerned, and he was so opposed to the use of albumenised paper for printing, that we do not remember ever to have seen a picture of his on this material. Towards the latter part of his life he abandoned photography altogether, so that those who have only recently become followers of our art are scarcely acquainted even with his name, but it is one which must ever be associated with the popular rise of photography.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VII. *(Continued.)*

The chin will partake of just a little of the colour applied to the cheek, so will the nostril and the ear.

The colour for the cheek may now be stippled over the whole face, excepting only the principal lights, but should by no means produce a very positive effect.

THE HAIR.

(See Maxim 45.)

As the colour of this will materially modify the general effect, you had better at once wash in the local colour. Indian yellow, with a slight portion of Venetian red, as your subject is fair, will form the wash. This must be used strong to kill the photograph, which is sure to be very much too dark, unless you have induced your printer (who is, however, not always very manageable in an artist's hands) to procure you a proof in which the hair has been rendered rather more opaque in the negative, or (by the aid of his aforesaid very useful bits of wool) printed but faintly in the positive you are colouring. A little warm sepia will serve for the darker portions, and the same used stronger will also answer for the darkest shadows and divisions. The high lights may be put in with white and yellow ochre, between which and the shadows place a cool grey, formed with cobalt and Venetian red, with a slight touch of madder pink. This same grey will answer admirably for softening the outlines of the hair into the flesh. When, however, this process does not give the desired colour for the hair, you may choose from the following list that mixture which most nearly approaches its apparent hue:—Raw sienna—warm sepia and Indian yellow—raw umber, or ditto with Indian yellow—burnt umber—yellow ochre and burnt umber—cold sepia—Vandyke brown. Having selected your colour, wash it over the whole of the hair. Many other mixtures for this purpose will suggest themselves in the course of your practice.

Refer back to remarks upon this subject under the head of "touching," and see Maxim 45.

THE NOSE.

Work (with the same tenderness and faintness of touch which I have so continually recommended) a *little* cobalt and Indian red* over the shadow tracing the outline of the nose, preserving the edges as indefinite and soft as is consistent with the due preservation of form. Put in the aperture of the nostril, in a series of faint touches, with vermilion and Indian red, and, with a touch or two of lake and burnt sienna, indicate the darker portions of this aperture as you find them in your "plain guide." The high light upon the tip of the nose may be got with a touch of Chinese white, and the less brilliant but conspicuous light running down this feature opposite the shadow* may be obtained by leaving it out when you are strengthening the tints about it.

* This must not be mixed to a cold or slaty hue.

THE CHIN, &c.

The chin is to be carefully and gradually rounded out with the tints already given. Detecting the faint reflected light beneath the shadow you may, by strengthening the first, give it more effect; and, unless the colour of the object reflecting this light decide otherwise, keep it warm.

Having proceeded thus far, pause, and carefully examine your work. If any lines appear hard and harsh, soften them by working upon their edges with a series of tints and colours, selected with a view to softly and harmoniously uniting the two edges, which are so abrupt in their meeting. If this grey, that pink, or this yellow hue are too positive, or do not harmonise, subdue them with the same patient care so urgently and frequently referred to. If that shadow has so hard an edge that it looks more like a patch of paint than a shadow, soften it into the lighter portions with warm and cool greys, using the warm first and the cool last, and keeping the first nearest the edge of the shadow, &c. Remember that all the flesh tints should melt imperceptibly into each other; that the touches must be very lightly applied, and without overcharging the brush with colour. Work up the dark tints very gradually. Put on the washes *very* pale; endeavour to keep them even and flat; and, to soften their edges, just touch upon them with a brush merely moistened with pure water; apply a wash as expeditiously as you can, and do not disturb it by touches, until dry. I am repeating myself again! you say. Well, and so I must, if I want to make an impression upon such material as beginners are composed of, as drops of water do on stone.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

A LADY.—C. A. L.—M. WARDLEY.—These correspondents will find replies in the continuation of my lessons in the present number.

ROBERT ROCK.—If you will refer to the lessons already published, you will discover the information you require.

NORTH LONDON.—I must test your patience. To give information here, which I must necessarily repeat in the coming matter, would be hardly fair. Please to excuse me. The specimen has not yet reached me, criticism will therefore be given in the next.

EMMA.—Your specimen is very neatly and carefully coloured; but too little has been done to destroy the terrible blackness of the shadows. [Black opaque-looking shadows would destroy the best painted flesh in the world.] Work over them with a little Indian yellow and madder pink.

Foreign Correspondence.

Paris, June 11, 1860.

I SEE, by a foot-note to my foregoing letter, that you do not share the favourable opinion which I expressed with regard to Woodward's solar camera. I am glad that this difference of appreciation occurs at the very outset of my correspondence; for, while it proves to your readers the complete independence of my judgment towards yourself, it will, at the same time, be an assurance of the impartiality which I maintain towards the inventors and artists to whose labours I call your attention. I have ever thought that, in publications like yours, such independence is rigorously necessary. A journal whose special mission it is to aid by publicity the progress of a new art or science, can efficiently fulfil that mission only so far as it stands free from *coterie*—an impartial organ for all. It will then be well understood that for the opinions put forward in these letters I alone am responsible; and I may add, that I shall see with pleasure that you or your readers discuss those opinions, for, in the course of such controversy, useful hints are often elicited. That being said, I will begin by proposing a motion, which I hope to see seconded by you, for its adoption seems to me to be of urgent necessity. English photographers have a valuable quality—one which their French brethren, unfor-

* In bad photographs these more delicate details are swallowed up in a flat mass of white.

tunately, do not possess in an equal degree. I refer to the liberality with which they publish their processes and discoveries of greater or less importance, and even their failures—in fact, everything in their experience which is likely to contribute to the progress of their art. It is, however, to be regretted that the propagation of this useful information is in part impeded by the diversity and the complicated nature of your weights and measures. In spite of long practice in this kind of labour, we are at each moment checked when translating the communications made to photographic societies or journals by the difficulty of changing the quantities mentioned with satisfactory accuracy. You have weights of different kinds for solids and for liquids. You have ounces, grains, drachms, minims, and even scruples—the two last designators do not figure in any comparative table. How can we find our way through such a labyrinth? I will not propose that you should adopt our decimal system, which is so simple, but would it not be possible to adopt in all formulæ a uniform system? Could you not count by parts in weight or volume, so as to be understood in all languages, or at least confine yourselves to grains and drachms? I put forward my proposition in all humbleness, but certainly there is something to be done in the interest of all.

The *Lumière* gave, in its number of the 2nd of June, a note presented by Mons. Poitevin to the French Photographic Society on his printing process (gallate of iron printing process). I call your attention to this note, which you may perhaps deem worthy of reproduction in full. I will give you the *resumé* of it. Mons. Poitevin makes a solution of ten grammes of perchloride of iron in one hundred of water, adding three grammes of tartaric acid. He applies the paper to this bath, and then allows it to dry naturally; but, before employing it, he dries it completely in a gentle heat. The paper thus prepared is of a dark yellow colour, but when dry and exposed to the light it soon becomes completely white. Ten or twelve minutes' exposure to the sun suffices; in fact, one is guided by the discolouration of the paper. To facilitate and accelerate the printing, sulphocyanide of potassium is added to the above-mentioned solution in sufficient quantity to give a blood-red colour to the paper as it dries. The picture thus obtained in red upon a white ground, is fixed and rendered ink-black by being rapidly washed in common water, or in water containing chalk. The design is then plunged into a solution of gallic acid to which has been added some tannin. The image gradually takes an ink-black colour, and when judged sufficiently intense, is washed in common water, placed between sheets of blotting paper, left to dry, and is completely fixed. If for the gallic acid bath you substitute a weak solution of red prussiate of potash, you obtain from the negative a blue design upon a white ground. The results of this process are spoken of favourably; but I have not yet examined any specimens myself. As soon as I have had an opportunity of doing so, I will tell you what I think of them.

I await with impatience the approaching meeting of the Photographic Society, for we are promised for that day some interesting experiments, into which I shall of course hasten to initiate you. I spoke the other day of the vogue enjoyed by the card-portraits; they appear to be making their way into other countries. One of my friends, the son of Mons. Ferrier, whose name is well known to you, has just returned from a long journey in Italy and Sicily, bringing back with him a complete collection of those little portraits, and among them some to which passing events give an additional interest. There are, for instance, those of the King of Naples and the members of his family. My friend tried to procure, by way of companion picture, the card-portrait of Garibaldi which was made at Genoa; but our witty critic, Alphonse Karr, had slily bought up all the copies for his *Guêpes*, a humorous journal which he conducts at Nice. I should not be astonished to see one of these days in our publishers' windows the visiting card of the Emperor of China or of King Kamehameha. But the following is a kind of portrait which had not yet been imagined. Messrs. Bisson Brothers, whose frequent journeys among the glaciers of the Alps have familiarised them with all the difficulties which an operator may meet with in those regions, have had a singular idea which they are about to put into execution. They start in a few days for Chamounix in order to make a new ascent, in company with Auguste Balmat and his guides, and when arrived upon the summit of Mont Blanc, can you imagine what they intend to do? Why, to take the portraits of those tourists who shall be bold enough to climb up to that lofty operating-room. Is not that a truly original idea? and does it not betoken a hardy pluck? Bold as the enterprise may appear, I doubt not that it will be carried out; and in spite of the relatively high prices fixed for these portraits (500 francs), I am persuaded that amateurs will not be wanting. As to competitors, I hardly think Messrs. Bisson need fear any upon the ground they intend to take up.

A clever photographer of Bucharest, Mons. Ch. Pap de Szathmari, who has already produced some very remarkable works, has recently passed a few days in Paris. He showed us some very curious specimens of relief engraving upon zinc, which he obtains by transferring a collodion picture upon a plate of that metal. He performs this operation very cleverly. The object which he has had in view is the production, at the smallest cost possible, of a topographical map of Wallachia, with the printing of which the government of that country has entrusted him. This is an important application of photography, and one of those in which the art may render the largest practical services, especially in the hands of experienced men such as Mons. Szathmari.

When I next write to you the meeting of the French Photographic Society will have taken place, and have furnished me, I trust, with some interesting facts, which at the present moment are far from being abundant.

ERNEST LACAN.

TO OUR READERS.

To meet the additional expense incurred for carriage and postage of this Journal throughout the Provinces, arising from the great bulk it has now assumed through the increased amount of matter published in each number, our Provincial Agents will be compelled to charge all copies issued after the present number at 4d. each. The price to purchasers in London and Liverpool will remain the same as at present, namely, 3d.; and subscribers can still have it forwarded direct from the publisher as heretofore upon payment of 8s. per annum IN ADVANCE.

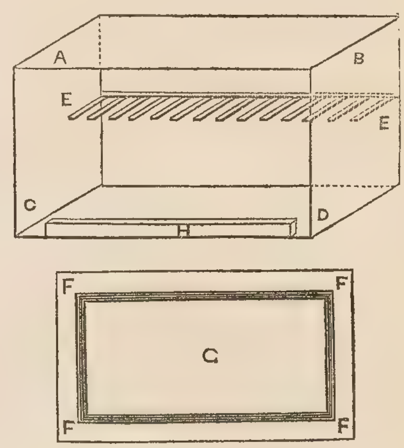
Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

RACK FOR DRYING PLATES.

To the EDITOR.

SIR,—The annexed sketch may probably be useful to some of your readers who, like myself, may have been puzzled for an effectual means of draining and drying their sensitive plates.



ABCD Mahogany box, twenty-four in., by twelve in., by six in.
EE Rails for supporting the prepared plates.
FFFF Shutter or door sliding in a groove.
G Yellow glass.
H Narrow gutta percha dish.

The bottom of this box is to be covered with blotting paper, and is capable, according to the above plan, of drying twelve stereo-plates, the tops of which rest or lean against the rails EE, which should be made of glass tubing, as wood will stain the plates. A narrow gutta percha dish should be placed inside the box, between the plates and the shutter, in which should be kept a little sulphuric acid to absorb the moisture from the plates.—I am, yours, &c.,

1st June, 1860. THOMAS CLARKE.

[We have had in use for some time an arrangement not unlike the foregoing in *appearance*, but far more effective, the rails being made of an elastic kind of wood (lancewood), with a small rectangular hole near the extremity, the plates being put on end anglewise, the lower angle in the trough (or in our case, between two slips of glass about the eighth part of an inch apart), on the upper angle in the hole in the elastic rail which is "sprung" on to it. Any number of plates may be put in, and the whole turned topsy-turvy even, without upsetting the plates, or allowing them to strike against each other. We got the hint from our friend, Mr. Rosling; but we do not know whether it was his own contrivance, or whether he received it from some other photographer.—Ed.]

UNCERTAIN FORMULÆ AND DOUBTFUL LOGIC.

> "He was in logic a great critic,
> Profoundly skilled in analytic:
> He could distinguish, and divide
> A hair 'twixt south and south-west side."—*Hudibras.*

To the Editor.

Sir,—A few remarks of mine on the folly of slovenly manipulation made at a recent meeting of the South London Society, have obtained for me the doubtful honour of the notice of your correspondent "Israel Holdsworth." Mr. Holdsworth is angry, and writes with the recklessness and lack of precision which usually characterise an angry man. I am somewhat disposed to adopt the reply of the giant who was questioned as to why he permitted his vixenish wife to thrash him:—"It pleases *her*, and don't *hurt* me."

I will, however, sir, by your permission, just point out one or two errors into which Mr. Holdsworth has fallen.

The report to which he refers is manifestly, to the meanest capacity, an abstract or condensed report, in which the remarks of the speakers are stated, as reporters technically phrase it, in the third person, in which it is impossible that the *ipsissima verba*, or exact words of the speaker, can be given, but instead thereof such an epitome as in the reporter's judgment most perfectly renders the meaning and intention of the speaker. This being the case, what becomes of Mr. Holdsworth's series of extraordinary *verbal* criticisms?

Again, if verbal quibbles have such a charm for Mr. Holdsworth, he will find, on a careful examination of the report in question, that I am not made even to mention his name, but merely to regard him as representing a class, the remark reported as mine being "that when *a* man (*ergo*, *any* man, Mr. Holdsworth) of such a stamp said he had no failures, it was more than probable that less partial judges would say he had no successes."

But enough, sir, of verbal criticism. What were the exact words that I made use of at the meeting in question I do not remember, but the remarks as reported accurately enough express my meaning. I have no fancy for following Mr. Holdsworth through his display of word fencing. Mr. Holdsworth describes himself as a "successful photographer;" but if he be as successful in producing a picture as he is in putting a proposition into the form of a syllogism, his photography and his logic may both serve as beacons to be avoided if not as guides to be followed.

Mr. Holdsworth asks why I did not show his statements to be erroneous? Simply because they were more calculated to cause a smile than to call for refutation. Inexactitude in formulæ and in manipulation has been, I believe, a fertile source of failures; but a letter like that of Mr. Holdsworth's is one of those evils which carry their own cure—its very extravagance rendering it harmless.—I am, yours, &c.,

G. WHARTON SIMPSON.

PERSPECTIVE.

To the Editor.

Sir,—In the last number of your Journal, Mr. Hannaford attacks Mr. Grubb for his letter on "Perspective." It is certainly quite true that to represent in a drawing a tower with vertical sides by converging lines is absurd—that is exactly what Mr. Grubb proves; but to say that he is therefore guilty of an Irishism is rather preposterous. It would seem that Mr. Hannaford sees some absurdity in the "converging perpendiculars," although he seems to have a kind of idea that it is right to make the perpendiculars converge. He ought to see something rarely ridiculous in representing the horizontal lines in nature by converging lines on the drawing. According to his way of viewing the subject, converging horizontals should be as absurd as "converging perpendiculars." Now I think it most objectionable to attack everything an Irishman says on the ground of its being an Irishism. I remember the bad taste shown by another writer in taunting Mr. Grubb for being an Irishman at the commencement of their discussion on lenses. In the present case the imputation is more than usually absurd, and only shows that Mr. Hannaford does not in the least understand Mr. Grubb's argument, which is both simple and *conclusive*. Moreover, Mr. Hannaford is guilty of a blunder, of which an Irishman would be ashamed, when he tells us to look down perpendicularly from a bridge on a line of railway, "so that the *point* of sight—the real *point* of sight this time—shall be in a position at *right angles to such line*."—I am, yours, &c., A. N.

Hereford, June 6, 1860.

DEVELOPING, TONING, &c.

To the Editor.

Sir,—I beg leave to bring before you a few things that have suggested themselves to me. First, Is it not time that The British Journal of Photography was made a weekly publication? You don't seem to get through with your matter, and it is tantalising to have so many continuations.

In the number for 1st June your Paris correspondent speaks about card portraits. I have seen a number done by Disderi & Co., 8, Boulevards des Italien, Paris, and they are very pretty. When I first saw them, I thought it would be of use to know by whose lenses they were done—for they had *great* depth of focus—and what developer was used. The negatives do not seem to be intensified, the prints are pure in the whites, with good blacks and excellent half-tones, and, what adds to their beauty, the figures are well posed. Perhaps your correspondent could say a word on these points.

In the last number you answer R. Mulock on proto-nitrate of iron, and say, "It should be used *without* any acetic or nitric acid, and, when freshly made, the positives developed with it are of a brilliant metallic hue." I have sometimes forgotten to put in the acid, and got very dark cloudy pictures. Hardwich recommends acid, and Keith and others publish that they use it. Was there no *mistake* in your answer?

Mr. Hughes, in his paper on printing, suggests toning a great number of prints at once, but recommends beginners not to have more than a dozen in the bath at one time. When I put several prints in at one time, some of them tone unequally, and have red spots.

When prints are long washed, say five or six hours, the toning bath seems to have little effect on them, and if washed for two days they won't tone at all. What is the reason?

Hoping you will excuse these rambling remarks, I remain your *own* and The British Journal of Photography's well-wisher,

Glasgow, 8*th June*, 1860. J. R. A.

[We are not of opinion that a weekly issue is advisable: others have tried it, and the result would by no means satisfy us. Something more than novelty is required in the matter, and be assured that "easy reading requires hard writing"—the element of *thought* is a *sine qua non*.

Our Paris correspondent will possibly reply to your inquiries.

There is no mistake in our reply to R. Mulock. Proto-*nitrate* of iron, made as there directed, does *not* require free acid.

You must fail, because you allow your prints to *touch* one another, and enclose air bubbles between them. Keep them moving about until toned. There must be some error in your manipulation; but why wash so long?

Thanks for your good wishes.—Ed.]

INSTANTANEOUS VIEWS.

To the Editor.

Sir,—Being desirous of taking instantaneous pictures, will you be so kind as to inform me what bath, whose collodion, and what developer I should use? Can you also suggest a simple form of instantaneous motion-shutter, to be fitted to the hood of a quarter plate portrait combination, and oblige?—I am, yours, &c. A. Y.

London, 22*nd May*, 1860.

[In taking instantaneous views it is necessary to have the neutral nitrate bath and an iron developer in good working order; use a good negative collodion, and any instantaneous shutter, for instance, that introduced by Messrs. Murray and Heath. If you wish to take stereoscopic pictures instantaneously, you must use a pair of lenses (whether *single* or double combination) simultaneously, and you may then employ an instantaneous movement contrived for this purpose which we lately introduced to the notice of the London Photographic Society, the pattern of which is in the hands of Mr. Melhuish, of the Haymarket.—Ed.]

"STOLIDAM PRÆBET LIBI VELLERE BARBANE."

To the Editor.

Sir,—I remember reading of a wonderful Yankee who, when his crops wanted a shower, sent up a rocket to bring it down; but I was somewhat surprised to find such a heavy shower of words brought down by the playful little squib discharged at a recent meeting of the South London Photographic Society, by Mr. G. W. Simpson. Mr. Howard's pictures and his careful manipulation are both well known to us, and the first are about the best argument in favour of the last that could be brought forward, and Mr. Israel Holdsworth must advance stronger evidence in proof of the superiority of his own productions than the mere assertion which he seems to consider "the clenching argument." Permit me to try my hand at a syllogism after the pattern of Mr. Holdsworth's. According to Walker, to demonstrate is to prove with certainty.

He (Mr. Holdsworth) says, a fact can be demonstrated but not proved, to demonstrate is to prove; *ergo*, a fact cannot be demonstrated.

Permit me also to tell Mr. Holdsworth that when a reporter gives a speaker's own words they will be found between inverted commas.

Hoping these few lines may not bring about another epistle from the same quarter.—I am, yours, &c.,

A MEMBER OF THE SOUTH LONDON SOCIETY.

June 2*nd*, 1860.

AN OPINION ON "COMPOSITION PICTURES."

To the Editor.

Sir,—All lovers of true art, and all those who are interested in the development of photography in its higher flights, must have been annoyed at the letter purporting to be written by "Mrs. Spriggins," in your last number, attempting, with rough but feeble wit, to cast ridicule on an artist who has done much to raise the camera from a mere copying machine into an instrument for recording artistic thought. Mr. Robinson's merits and ingenuity are, I am sure, safe in your hands. You have always upheld him (as you have others) in his efforts to advance photography, therefore anything in his defence from me would only be superfluous; but I trust that I may be allowed to say, I hope he will take no notice of such silly nonsense, but will continue to delight the photographic world with his charming pictures for many years to come.

I cannot help pointing out a circumstance which I think requires notice, namely, that whenever anything out of the usual way is brought before the public there is always a set of envious men who, not having sufficient talent to do the same themselves, try to bring the novelty into contempt. In your number for the first of May a correspondent attempts this, but instead of proving Mr. Robinson to be ridiculous, as appears to have been his intention, he only exhibits his own want of knowledge, and calls down upon himself an editorial reprimand, which should have deterred him from attacking, in your last number, another gentleman; but some men, having no other mode of emerging from their well-merited obscurity, *will* rush into print, and if they cannot write sense, make up for the want of it in quantity, occupying space which might be much more ably filled by others.—I am, yours, &c.,

FAIRPLAY.

[Our fair correspondent, like most of her sex, is a warm advocate; but is she not a little too hasty in attributing evil motives where such may not exist? We have always upheld freedom of discussion; and what has been designated "an editorial reprimand" was not so intended, but merely a protest against our being supposed to entertain similar opinions to those expressed by our then correspondent. Had we regarded the opinions as expressive of malevolence they would have found no place in our columns. In the present number we publish an article from a valued contributor, an artist and photographer, taking the view totally opposed to our own. We believe that we can point to what a lawyer would call "a flaw in the indictment," but that we shall leave to another opportunity—partly because we wish to let others have the opportunity of finding it out and exposing it, and partly to let each side have a fair hearing. Of the good faith and good feeling of our contributor we do not entertain a doubt. Fair controversy, conducted in a spirit of consideration, tends materially to elicit truth. We are obliged to the lady who, under the signature of "Fairplay," has expressed her appreciation of Mr. Robinson's labours, shared in, as we are well assured, by many; and we are not the less pleased that it has afforded us the opportunity of declaring our conviction that the contest is purely a friendly one.—Ed.]

ALLEGED POISONING BY CYANIDE OF POTASSIUM.

To the Editor.

Sir,—It is a well-known axiom in philosophy that, "if each one of two quantities be equal to a third quantity, they must of necessity be equal to each other."

I am led to make this remark by a note in Mr. S. Highley's Table of Antidotes, where it is said that two and a-half grains of pure cyanide of potassium are equal to one grain of anhydrous prussic acid, or fifteen minims of the acid of the London pharmacopœia.

Now the acid hydrocyanic dil. P.L. contains two per cent. of anhydrous acid, consequently an *erratum* should be inserted—for "fifteen" read "fifty." Is it customary in a printing office for one person to read the manuscript and another to set up the type? If so the error would be easily accounted for by the similarity of sound in the two words without attributing carelessness to the author.

In your review of Mr. Hockin's "Practical Hints," you notice the case of a photographer who lost one of the bones of his finger, and nearly lost his life, through the sore being irritated by cyanide of potassium. Some years ago a similar case fell under my professional care, differing, however, in a few particulars. The patient was not a photographer, but an old woman; she was not fixing a picture, but scrubbing a floor; and the material she was using was not cyanide of potassium, but carbonate of soda. Her thumb was wounded by a loose wire at the back of the brush, and the inflammation caused by the soda extended so rapidly up the arm, that she lost, not only the first joint of her thumb, but her life also. Here I believe that the irritating cause was the *soda*, and probably the same effect would have resulted had it been combined with hyposulphurous acid instead of carbonic. *Irritation* is not the physiological effect of cyanogen; and the second case that you mention may be explained by the paralysing power of the vapour of hydrocyanic acid acting on the respiratory nerves, and rendering voluntary efforts necessary to the continuance of breathing. Were the nerves of voluntary action also paralysed, death (not inflammation) would be the *immediate* consequence.

Was not the physician in question in the habit of using his solution so strong as to clear the picture *instantly*, and to require some dexterity in pouring it off before it had done any mischief?—I am, yours, &c.,

June 4th, 1860. M.R.C.S.

[We have to thank our correspondent "M.R.C.S." for pointing out the error in our Table of Antidotes: it escaped our notice in correcting the proof. The note was inserted simply for the purpose *of warning* those unacquainted with the composition of cyanide of potassium that it contained a body *well known* to be of a deadly nature; so far *the oversight* as it stands is of no great consequence, nevertheless, as a statement of a scientific fact it is erroneous: an *erratum* will be inserted.

Like Mr. Hockin, "M.R.C.S." seems to entertain a doubt as to whether the vapour arising from solution of cyanide of potassium *as ordinarily employed* in photography is baneful in its effects on the human economy. Dr. Taylor, in his "Treatise on Poisons," refers to several cases where serious effects presented themselves on inhaling *the vapour* of prussic acid *even when in a diluted form*. Scheele is said to have died from breathing the vapour of *the diluted* acid. It is well known that those who work in electro-plating and gilding factories have their nervous systems affected by habitually being in an atmosphere contaminated by the prussic acid vapour given off from the vats of cyanide of silver: the symptoms are frequent swoonings and loss of memory. We are personally acquainted with a gentleman who was formerly a superintendent at one of the large electro-gilding factories, but his health became so seriously impaired that he was obliged to throw up a very remunerative engagement.

If the habitual inhalation of the vapour from cyanide of silver at electro-plating establishments produces serious effects on the workmen, why should not similar results accrue to those who constantly employ cyanide of potassium, during the hottest hours of the day, in developing-rooms, which, as a rule, are small and badly ventilated?

We know of several cases of impaired health, which the medical attendants have *attributed* to their patients spending too much time in the developing-room where cyanide of potassium had been employed as a fixing agent. As prussic acid in classed amongst the Neurotic Poisons, would not the state of excitement into which amateurs sometimes work themselves on taking photographs, induce a condition very favourable for the poisonous vapour to produce its peculiar effects?—S. H.]

ANSWERS TO CORRESPONDENTS.

Errata.—In the Table of Antidotes given in last number under Treatment of Sulphuric Acid, &c., for "tracheometry" *read* "tracheotomy." In Note to Cyanide of Potassium, for "15 minims" *read* "50 minims."

Star Cross.—Ordinary chloride paper will serve your turn best.

Philomel.—The name is vile, as you say, but the results are good, nevertheless.

Conscious.—Time will show whether we are right or not. You begin at length to doubt your estimate: you will end by reversing it.

In a Mess.—In our opinion he is a very unsafe guide, so we do not wonder at your predicament. Get Hennah's pamphlet (Knight and Son); you may rely upon that.

T. B.—Your communication having already appeared in another journal we must decline it, with thanks.

Kangaroo.—Do you adopt this designation because you *jump* to a conclusion? You may be right, but you have no evidence of it.

Bothering Amateur.—We did not *recommend* the "linseed tea" process exactly, but *assented* to its efficacy. We will endeavour to meet your wishes in our next.

Omicron.—We prefer metal plate boxes (tin) for preserving dry plates; but the form is also a matter of importance, so as to rigidly exclude the possible access of light.

Robert Hulett.—Reply to your queries in next number. Had your note been forwarded direct to the Editor instead of to the Publisher, a reply might have appeared in the present publication.—[See usual Notice at foot.]

Objective.—What novelty do you suppose there is in this designation? The word has been in use in this country amongst scientific men who employ microscopes, telescopes, &c., for the last fifteen or twenty years, to our knowledge—probably much longer. Who can have hoaxed you by asserting it to be a novelty?

X. Y.—The addition of nitrate of silver to meta-gelatine ought not to occasion any turbidity; but if chloride be present, a cloudiness will result on adding diluted nitric acid and boiling. We advise you to filter the solution if possible, or, if that cannot be done, to begin again with fresh chemicals.

W. H. Walter.—Read Mr. Wall's articles on Colouring. We have referred your query to him, and he replies that, for this purpose, he uses water colours—Indian ink, madder brown, &c., with a little gum water, and, if the paper be *very* highly albumenised, a little ox gall may be added. Perhaps you charge your pencil too liberally with colour, or grease the surface in some way unnecessarily.

R. L. Dick.—For positives your bath should be slightly acid with nitric acid; add to it *one* drop, and try a plate. The proto-nitrate developer changes to a reddish colour as it decomposes, and simply becomes inert. Our statement in reply to R. Mulock applied to real proto-nitrate of iron made as there directed. We do not remember to what particular formula of Mr. Hardwich's you refer. When in town you cannot do better than attend Mr. Hardwich's classes, at King's College, to learn the practice of negative operations.

No Chemist.—The old toning and fixing bath in one ought never to be used. The method described by Mr. Hughes, in No. 113, is a very good one, and economical withal. It *is* absolutely necessary to wash the prints before toning; and heating the toning bath not only saves time but produces better results. The instrument you name can be procured at Mr. Hughes's establishment in Oxford Street. The number of prints fixable in a given quantity of hyposulphite of soda would vary according to whether they are all fixed in a short space of time or not. If the solution decomposes by keeping you had better make fresh; but so long as it remains free from sulphurous smell you may employ it. The quantity named ought to fix fifty prints of the given size at least.

Received.—C. Jones—R. Turnbull—Luna—Justitia.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 121, Vol. VII.—JULY 2, 1860.

It is not without considerable regret that we find two of our valued friends ranged on opposite sides regarding a question of very material interest to photographers, especially to the art-loving portion of them. As is generally the case under similar circumstances, where both sides are actuated by perfect integrity, and a hearty desire to further the advance of the artistic element, the difference of opinion existing may be readily traced to misapprehension on the part of one or both of the contending parties respecting the motives or views of the other. We refer particularly to the controversy between Mr. Wall and Mr. Robinson, on the subject of "Composition Printing from Several Negatives," connected with which two articles will be found in the current number of this Journal, and one appeared in our last, in addition to sundry comments, grave and facetious, which have previously "cropped out" in previous numbers, to all of which we solicit the attention of our readers. The immediate cause of the discussion arose from the fact that Mr. Robinson, at the instigation of the Council of the Photographic Society of Scotland, wrote a paper, the title being that above quoted, which was read at one of the meetings of the Society named. Mr. Wall takes exception to the course recommended in that paper, as, in his opinion, injurious to the cause of artistic excellence, besides destroying the chief value (to him) of a photograph — its truthfulness of representation; but certainly that which is regarded as the greatest aggravation of the alleged offence is, evidently, that it is committed by aid of the "paste-pot and scissors," which are abominations to an artist.

We have a few words to offer relative to each of these points. Mr. Robinson, for one of his compositions, received the prize medal awarded by the Photographic Society of Scotland for the *best group* displayed in the late exhibition of photographs held at Edinburgh. His paper was written as descriptive of the *modus operandi* by which he produced the specimen for which the medal had been conferred and similar compositions, and was therefore necessarily devoted chiefly to mechanical details. Mr. Robinson himself is quite conscious of, and admits, his inability to convey to others readily and clearly the ideas which are present to his own mind, consequently there is no wonder that his attempt to do so was more or less a failure.

Absolute truthfulness of representation is not a necessity of photography; on the contrary, there are many known departures from this assumed absolute correctness — for instance, the very tools employed, the lenses, introduce certain evasions of strict veracity; the equivalent effects of various colours, as regard light and shade, are not truly interpreted; and even the degree of variation is influenced by the nature of the chemicals used. But setting all of these considerations aside for the moment; as "composition pictures" assume only by their very designation to be regarded as pleasant fiction, their want of truthfulness—which is not claimed for them, but absolutely ignored—cannot be reasonably alleged as an objection. If this were admissible what becomes of the morality of Mr. Wall's own occupation? It is nothing that by his artistic skill and talent as a colourist he adds a new charm to the best productions of the camera, for by so doing he destroys the assumed absolute truthfulness of the original. If an offence be committed it does not appear to us any the less heinous for being executed strictly *secundum artem* than by the heterodox agency even of paste and scissors.

Mr. Wall admits that Rejlander "sails not under false colours;" surely we are not thereby intended to infer that Mr. Robinson makes any attempt to do so; in fact, the very candour of his paper which has drawn down the storm upon him, forbids our coming to any such erroneous conclusion. So much for the charge of a sacrifice of truth. But of course it will be argued that, if this charm be sacrificed, it is surely better to do it in such a way as will add to the artistic excellence than detract therefrom—granted; but is it absolutely *necessary* that by the use of paste and scissors, artistic excellence should be destroyed? Surely not, for even our worthy censor admits its existence in an eminent degree in some of Rejlander's charming productions, especially in that beautiful one, *The Head of John the Baptist in the Charger* (and, by the way, instead of criticising that picture ourself just now, we refer our readers to the close of Mr. Wall's article in the present number, as we fully endorse all his encomiums); need we say this was produced without preliminary decapitation, and therefore we fear that the obnoxious paste and scissors played an important part in the manipulation, yet there is no hardness of outline to offend the eye. Our friend has, however, already discovered the existence of Rejlander's paper to which we intended to refer him (see our number for 15th April, 1858), and he appears not a little pleased therewith, and with justice we must allow; but what becomes then of his stigma of "Patchwork?" truly it descends like a counterpane —no, a wet blanket—plump on the head of Mr. Robinson, whose "pictures and paper display the same idea" of "cruel cutting outlines," &c. That his pictures have many faults no one is more conscious than himself; but they have beauties too, and do display a considerable amount of conception, thought, and arrangement: witness his *Fading Away*, which, though a very painful subject, exhibits feeling and pathos in an eminent degree, in spite of some hard outlines which we admit to be present. Now these hard outlines are *errors of manipulation*, and not necessarily persistent after the use of paste and scissors, as we knew; for we had not forgotten Rejlander's "pencil of light"—his brush made out of a sunbeam—even though Mr. Robinson may not have yet acquired sufficient skill in its handling.

It is quite gratuitously assumed that Rejlander looks upon the paste-pot and scissors as *disagreeable necessities*, simply because he says that "an abler artist, with better means, could do a better thing;" and still more illogical is the assumption that *therefore* he agrees in the opinion expressed by Mr. Wall, that "a lens commanding a wide angle of view," &c., "and a good enlarging process, are the right tools to work with." On the contrary, we opine that the fact of his having adopted the other alternative, knowing at the same time so well what he was about, proves more satisfactorily than any words could do which course he judged most likely to accomplish his object. This is, however, but little to the purpose: it is not what A or B *thinks* the best, but what *is* the best to follow. We shall be only too glad to induce Mr. Wall to try his hand at "composition photo-

graphy" in any way he likes. We have no doubt that he will, if he undertakes it, produce something worth looking at.

Mr. Robinson's paper made no mention of conception, design, study—for a very simple reason: he could not suppose that any one would attempt a *composition* without it—he did not profess to teach that which Rejlander had already done, and done better than the former felt himself able to do; but he treated of that on which Rejlander touched but lightly or only hinted at—some portion of the necessary mechanical drudgery.

We have taken up the cudgels against our esteemed friend Mr. Wall, for in hitting Mr. Robinson he also hits us. We are a *particeps criminis*, for we frankly acknowledge to having encouraged him in his flagrant practices; and we feel that, where he fails, it is not owing to an absence of the mental element, but to a deficiency of manipulatory skill. In fact, he is no conjuror, simply because he tells you how he performs his trick.

The point first started with—the presumed impossibility of artistically combining portions of different negatives into one harmonious whole—having been abandoned, we are not going to enter the lists with Mr. Wall on the question of pure art, as regards this or that production; for the chances are that his weapons are better than our own, and that he has more skill in their use: moreover, the regions of art are his own familiar arena, his birth-place and home as it were; and, as "discretion is the better part of valour," and having no wish to be conquered, we prudently decline the contest, feeling by no means certain that if it came to argument upon the art-merit of any particular picture we might not be brought over to his way of thinking; for we hold it as indisputable, that though an art-amateur may fail to *discover* a beauty, yet if pointed out it cannot fail to be *perceived*, provided it be really existent, and not the mere chimera of the artist's brain.

A short anecdote may perhaps explain our meaning more clearly. A farmer giving evidence on a trial, was being cross-examined by the counsel on the opposite side, and the latter was getting more and more "put out" in consequence of the straightforwardness and good sense of the witness's replies, which did not tell in favour of his client. Not being able to find any other fault, he desired him very testily to "speak up!" for he could not hear him. "I do speak up as well as I can!" said the farmer." "The learned counsel means that you do not speak as loudly as he does," interposed the judge. "Of course not," replied the farmer, "'taint loikely—*it's* HIS *trade!*"

We feel that an apology is necessary for the length to which this article has extended, but trust that the interest of the subject will excuse us.

We notice an official announcement from the Spanish Minister, relative to the admission into Spain of scientific apparatus free of duty, for the purpose of making observations in connexion with the forthcoming eclipse of the sun, provided a bond be entered into for its re-exportation in due course. In this concession photographic apparatus is included; it therefore becomes our duty to record the fact for the benefit of our readers.

In the discussion that has been carried on for some time respecting the relative merits of different kinds of collodion, we regret to find that a species of jealous feeling very much prevails, of which our friend, Mr. Hardwich, appears to be the victim—and very unreasonably so.

The only possible cause for this injustice can be the erroneous impression that Mr. Hardwich is commercially interested in the manufacture of the article. This impression is evidently encouraged by such phrases as the following, viz., "Ponting's, Hardwich's, or Thomas's collodion, and *that of other makers*," which we find not unfrequently employed. Moreover, we occasionally see "Hardwich's collodion" mentioned in some advertisements. We can scarcely, therefore, be surprised at the existence of the misconception. We, however, think it very unfair towards Mr. Hardwich; for we know of a certainty that he is in no way commercially interested in the article, and, having so liberally and unreservedly given to the public the result of his labours, the imputation conveyed is a source of considerable annoyance to him. So far as the advertisements are concerned, were we in his situation, we should make very short work of the matter by absolutely prohibiting the use of our name. We hope, however, that our notice of the subject will, for the future, obviate any misunderstanding on this point.

We recently described some novelties in apparatus: we now notice a form of stereoscopic camera with which we have been much pleased—it is that lately exhibited by Mr. Hare at the North London Photographic Association. The whole of the apparatus fits into a light mahogany box—that is to say, camera, lenses, screw, slides, &c.—the total weight being very moderate in amount. The box forms the top of the tripod, the camera being attached to the same when in use by a screw in the usual way, so that it can revolve in azimuth. The camera is on the bellows principle; and though as a rule we do not prefer this form on account of its liability to vibration, we think that in this instance the instrument is free from that defect. The adjustment for focus is very conveniently arranged by means of a screw at the back, the lens fittings simple and rigid, and with but trifling weight, and can be contained within the body of the camera when in use, so that a contrivance for instantaneous exposure can be readily adapted in front without in any way interfering with ordinary arrangements. The various slides, &c., are contained in the box which forms the tripod head, and are accessible by a special side door in it, by which they are not only conveniently disposed, but are thoroughly protected from the possibility of the unauthorised intrusion of light.

We have recently examined also a contrivance, by the same maker, for an economical swinging back, having also the advantage of causing very little additional bulk, and allowing of movement in both lateral and vertical directions. The former movement is obtained by means of the sliding body passing through an elastic packing, a slot being formed in the plate of the binding screw, which admits of considerable play and yet can be firmly fixed in the desired position. The vertical movement is effected by the slide frame having a swing movement upon its bottom edge as a centre, and screw adjustments at the side. The cost of this arrangement is not above one-tenth part of that entailed by the ordinary arrangement for a swinging back—at least so we are informed.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 7.

The importance of the alkaline hyposulphites is almost solely due to their use in photography, and hence it is not to be wondered at that their reactions with the salts of silver are not familiar to chemists. In a former article we called attention to the importance of distinguishing between the two double salts of hyposulphite of soda and silver described by Herschel, one of which contains more silver than the other, and is far less easily soluble in water. Since that time we have carried our experiments further, and with results quite different from what we anticipated. Nevertheless, since experiment is the test to which every expressed opinion must be subjected, it will be better at once to describe what we have done.

The experiments were commenced by preparing the second or sparingly soluble double salt of Herschel, by adding the correct quantity of chloride of silver to hyposulphite of soda; and here it was observable to how great a degree this compound possesses a property, shared with it by many other substances, of remaining for a time dissolved in water in a proportion beyond the saturating point. The crystals may continue separating from the liquid day by day, for a week or more, and this even in a closed vessel where no evaporation is permitted. When, however, the separation has once taken place, it requires a very large bulk of water to redissolve the crystals, certainly not less than three hundred times their

weight, as far as we can judge by an experiment made rather hastily.

An aqueous solution of the above crystallised salt has a perceptibly sweet taste, and possesses the following reactions:—Nitrate of silver throws down a precipitate of hyposulphite of silver, which is at first white, but almost immediately becomes yellow and then brown. If, however, a little chloride of sodium be added to the solution of the crystallised salt before the nitrate of silver is applied, the mixed precipitate of chloride of silver and hyposulphite of silver then obtained does not spontaneously change in colour, but remains white, even in presence of an excess of nitrate of silver. Light acts upon this mixed precipitate, but the darkening is different in appearance from that which results when pure chloride of silver is exposed to the sun's rays. The solution of the crystallised double salt does not become at once milky on adding an acid, but remains clear for a time. A minute quantity of chloride of sodium added to the solution of the double salt causes a white turbidity, which is removed by ammonia. A larger quantity of chloride of sodium added to the solution at first causes turbidity, but afterwards clears up the liquid by redissolving the turbidity. A small quantity of iodide of potassium throws down iodide of silver, recognised by its colour; a larger quantity redissolves this iodide in the form of a double iodide of potassium and silver, which is again decomposed on dilution with water.

The above facts have much significance. They show us, in the first place, that the ordinary tests for hyposulphite, viz., its blackening with nitrate of silver, and its becoming milky with acids, may fail in some cases; and, secondly, they prove that there are conditions under which the affinities of chlorine and of iodine for silver are greater than that of hyposulphurous acid, that is to say, when the alkaline hyposulphite is not present in great excess in relation to the silver salt, or, more particularly, when the alkaline hyposulphite being in small quantity the alkaline chloride or iodide is in excess. In such a case, supposing the proportion of silver to be below a certain point, the chlorine or the iodine will take it before the hyposulphurous acid. Thus, if we make a solution of iodide of silver in iodide of potassium, and add hyposulphite of soda in minute quantity, no precipitation takes place, and on diluting such a mixture with water, so as to throw down a deposit of iodide of silver, hyposulphite of soda will be found in the supernatant liquid.

The inquiry will here be made:—What test is applied to detect the presence of the hyposulphite of soda in the above case? We have devised the following, which appears to answer: add, first, excess of iodide of potassium, if it be not already present, until the iodide of silver thrown down is taken up again; then drop in a dilute solution of *iodine*, when, if hyposulphite be contained in the liquid, the colour of the iodine will be removed by the conversion of the hyposulphite into tetrathionate. It may be mentioned, however, that a more simple test will often be sufficient to indicate the presence of hyposulphite, viz., *the taste*. When the hyposulphite exists in combination with silver the sweetness is perceptible even after extreme dilution; and with hyposulphite free from silver there is a persistent bitterness left on the palate which is not easily disguised. Our friend, Mr. Hadow, finds a solution of permanganate of potash to be a good test when organic matters are absent: the purple colour will be immediately discharged by even a trace of hyposulphite.

Reasoning on the facts now laid before the reader, it seems impossible to avoid the conclusion that the action of an atom of hyposulphite of soda upon an atom of chloride of silver, must have a limit short of a complete double decomposition; because, after a certain point, the opposing affinity of the chloride of sodium formed in the liquid comes into play, and tends to keep a certain portion of the silver in the state of chloride. If, however, a large excess of chloride of silver were present, then it might be conceived that the whole of the hyposulphite of soda would pass into the state of hyposulphite of silver, since the chloride of sodium would have a sufficiency of chloride of silver in excess wherewith to satisfy it and prevent it from offering any opposition. To put this to the test of experiment, a strong aqueous solution of chloride of ammonium was first saturated with chloride of silver, so that the smallest addition of water caused a milkiness. Into this liquid some of Herschel's crystals, containing an atom of hyposulphite of soda with one of hyposulphite of silver, were dropped. What then might be expected to happen? Surmises were out of the question, and it seemed better to wait and see what would happen. The result was that the crystals were quickly decomposed, clotty masses resembling chloride of silver remained at the bottom, and the solution on being tested was found to contain hyposulphite.

If, therefore, an alkaline chloride decomposes hyposulphite of silver, and the same alkaline chloride previously saturated with chloride of silver does so likewise, it is incomprehensible that chloride of silver, however applied, can be capable of removing the whole of the hyposulphurous acid from its combination with soda. Therefore at present we are at issue with Mr. Dawson, although previous to any actual trial we were disposed to give his views our most hearty concurrence. It will be better in every way to discuss the subject freely, since the whole chemistry of the hyposulphites is so complex that no one need fear a confession of having been mistaken. We therefore publish our results without an idea of being confounded if any one afterwards proves us to be wrong. Our confident belief is that the views now brought forward are sound; for having tried Mr. Dawson's experiments carefully, we cannot succeed in removing the whole of the hyposulphite from its combination with soda by agitation with chloride of silver. Hyposulphite still remains in the solution after a prolonged digestion, and defies all attempts at separation. It is of no use whatever to appeal to first-rate chemists in a case of this kind, and ask them their opinion: they will reply at once that the hyposulphites need more investigation, and that it is hard to say what would happen in a given case. Experiments must be made, and photographic chemists being most interested are the proper persons to conduct them. Many of the readers of this Journal will scarcely take interest in so abstruse a question, but some will doubtless see a new field for investigation opened before them, and will be inclined to enter into it.

We conclude this article by giving a summary of our results. When nitrate of silver is added to hyposulphite of soda, with the proper precautions to prevent spontaneous decomposition of the resulting hyposulphite of silver, two atoms of the latter will dissolve one atom of the former, and Herschel's sparingly soluble salt will be formed. It will require, however, rather more than two atoms of hyposulphite of soda to dissolve one atom of chloride of silver, since the chloride of sodium produced during the double decomposition exercises an opposing affinity. And when iodide of silver is acted upon by hyposulphite of soda, the quantity dissolved will be *decidedly* less than theory indicates for the above-named crystalline double salt, inasmuch as iodine is very strong in its affinity for silver. This last fact, indeed, is not new, for it was shown by Professor Donny, in an early volume of the Society's Journal, that the quantity of iodide of silver which the fixing bath would take up was altogether smaller than that of chloride of silver, and that when iodide of sodium had accumulated in the bath its solvent action became almost suspended.

COMPOSITION NOT PATCHWORK.

By H. P. Robinson.

That facility in communicating one's ideas with lucidity is a qualification advantageous to its possessor few persons will be disposed to deny, especially if, like the writer, its absence somewhat involves them in a dilemma similar to that in which I at present find myself placed.

That the animadversions to which my paper on *Printing Photographic Pictures from several Negatives*, read before the Photographic Society of Scotland, and published in your number for 2nd April last, have given rise are not well founded, I am thoroughly convinced; but, from absence of the happy knack possessed by some more fortunate in this respect than myself of saying the right thing at the right time, I may, perhaps, find some difficulty in rebutting them. No sensible man would feel annoyed at, or think it necessary to reply seriously to, jocular criticisms like those proceeding from your correspondent, Mrs. "Penelope Ann Spriggins," but would be rather inclined to join in a good-humoured laugh against himself. With regard to an article which appeared in your last issue, from the pen of Mr. A. H. Wall, under the title of *Composition* versus *Patchwork*, the case, however, assumes a somewhat different aspect, because Mr. Wall's opinion upon such a subject is entitled to consideration; and though his remarks are entirely free from offensive personality to myself, but rather directed against the practice of photographic composition in the special manner that I follow and conceive to be a legitimate occupation, I feel that, as they were elicited by a paper of mine, I am in some measure called upon to make some rejoinder. I shall, however, do so very briefly, leaving my justification in your hands, because it is partly owing to your commendation of my first effort in this direction that I was induced thus to turn my attention to it, and this principally from pure love of the art.

I am sorry Mr. Wall objects to composition. He is a gentleman for whom I have the greatest respect, and, from what I have

hitherto seen of his writings, I thoroughly believe in his perfect good faith. I do not expect him to admire my works: I am well aware they are full of faults, but they must be put down to my want of skill. I beg to offer the following remarks on Mr. Wall's objections:—

Mr. Wall should know that at least *two* of the "barbarous wielders of the scissors" have "touched the pencil under the guidance of a cultivated taste," and that they know all about the difficulty of imitating "that imperceptible boundary of vision which we call the outline;" and, having previously encountered this difficulty in many years' experience as painters—for some photographers learned art before they used a camera—they know what is required, and are devoting their attention to its accomplishment. This done, I fancy Mr. Wall's principal objection will be removed.

Rejlander can join the portions of a picture so that *I* cannot find the outline, therefore I cannot see the application of the paragraph directed specially against the scissors as a tool to work with. I am happy to say that I can see my faults, or I should never improve.

Some writers hold that there is a "fault in faultlessness." In the *Curiosities of Literature*, Disraeli quotes Trublet as follows:—"The more there are *beauties*, and *great beauties*, in a work, I am the less surprised to find *faults*, and *great faults*. When you say of a work that it has many faults, that decides nothing: I do not know by this whether it is execrable or excellent. You tell me of another, that it is without any faults: if your account be just, it is certain the work cannot be excellent."

If I want a few yards of the top of a hill as a base for figures (as in *Nearing Home*), and if it suits me to make a *fac-simile* of a small portion of that hill in *real* earth and *real* vegetation in my garden, why should I not be allowed to do it? The same with the water in *Preparing to Cross:* would the "deception," as Mr. Wall calls it, have been discovered, if I had not myself revealed it? And, if discovered, where is the harm? I do not assert that it is a portrait of a particular hill or a particular river.

I maintain that I can get nearer to the truth for certain subjects with several negatives than with one. Witness the foreground and distance in the *Top of the Hill*—the one five yards from the camera, the other a mile.

How does Mr. Wall propose to take such a picture as *Fading Away*, including a natural sky, "with a good enlarging process, and a lens commanding a wide angle of view?" Again, let his models be ever so clever, how would he get thirty or forty of them to keep still at the same moment, to say nothing of expression, as in Rejlander's *Two Ways of Life?*

As to ridicule, we must, of course, bear it; but we can take some comfort from the progress of pre-Raphælitism, for many years justly laughed at for its crudities and bad drawing, as my attempts are laughed at for their "cruel cutting outlines," &c. Walk, however, through the Academy's Exhibition, and see how four-fifths of the pictures have been influenced by the works of the men who were scoffed at; and mark the progress from their first works to Hunt's picture, now exhibiting in the German Gallery. Now, I quite feel the immeasurable distance between the genius of Hunt and Millais and Rejlander's and my humble talent; but, *parvis componere magnis*, I do think that in years to come composition photography will have as much influence over the art as the pre-Raphælites have had over painting. Their faults have smoothed down, but are we not to be allowed room and time for improvement? Are our faults to be eternal? I quite believe the time will come when photographs will be admired more for their invention than their execution.

"COMPOSITION" versus "PATCHWORK."

By Alfred H. Wall.

Will you kindly permit me to add to my previous observations upon the above subject just a few more words, as, from remarks which have reached me from various quarters I fear that my purpose therein runs some risk of being misunderstood. Since the publication of the last number of The British Journal of Photography, a friend has very kindly called my attention to the paper read by Mr. Rejlander at the Photographic Society, in April, 1858, upon *Composition Printing*, in which he describes his very beautiful picture, *Two Ways of Life*. Now there is a very wide difference between the two papers by Robinson and Rejlander; but, although in my present voluntarily assumed position it is, perhaps, cowardly to shrink from expressing honest convictions because I respect the individual concerned, or fear misrepresentation, I shall excuse myself with one of our handy old apothegms, "comparisons are odious," and only advise all who have read but one of these papers to read the other, and *compare the two*.* Both of these gentlemen and myself have at heart the same object, viz., the advancement of photography; and I appeal to that sympathy which community of tastes and pursuits ought to originate to prevent, on their part, any misunderstanding of motives. I might not perhaps think it necessary even to do this had I not seen a letter signed "Fairplay," in the last number of your Journal, in which a gentleman, whom I have every reason to esteem and respect, has been traduced for speaking his mind in a manly and straightforward—but good humoured—manner. The epistle in question, however, having been written by a lady precludes further criticism.

Mr. Robinson will excuse me, I trust, in frankly stating that I consider his pictures are not artistic. More or less, all that I have seen lack pictorial excellence; and when I read this gentleman's paper I at once understood why they lack this most important element. He describes therein not "composition" printing, but a kind of "patchwork"—the mere *mechanical* process of "printing photographic pictures from several negatives," and nothing more—a process which, as he frankly enough confesses, "is so simple, that he never before thought it worthy a written description," but which he, nevertheless, appears to esteem highly, and think important.

I look at Mr. Robinson's pictures, and find hard, inelegant outlines, an absence of refinement in their execution, no very studious arrangement of light and shade as elements of breadth, &c., also a neglect of the rules of composition, which, before I read his paper, I was inclined to attribute to downright carelessness; but, having read it, I now perceive that he has given the scissors and paste-pot credit for qualities properly emanating from the study of art—or, in other words, followed the crowd of photographers in perseveringly or obstinately giving to their tools the credit which should have been won by their brains, and making a boast of qualities really and purely mechanical, instead of such as reside in the higher regions of the intellectual, the poetical, and the artistic.

Turning from this gentleman's pictures to his paper, I find the mechanical idea dominant, although disguised, transparently enough, under the name of art. He "*cuts out*" here, "*pastes on*" there, compounds artificial landscapes in miniature in his "small back yard," &c.; but he says nothing of "the conception of a picture, the composition thereof, with the various expressions and postures of the figures, the arrangement of draperies and costumes, the distribution of light and shade, and the preserving it in one subordinate whole." Mr. Robinson says encouragement should be given to "any efforts to advance art," and "to the attempts of the few who try to get out of the beaten track (failures though they may be);" and, if Mr. Robinson humbly considers himself as one of these few making this attempt, will he kindly consider me as a very unpretending, but bluntly-speaking friend, desirous, to the best of his poor ability, of lending him a hand; or as one fighting shoulder to shoulder *with* himself and our few good comrades, against the prejudices of photographers, the jealousies of artists, the dogmatism of critics, and the ignorance of the general public.

Rejlander's pictures are eminently artistic, and so was his paper. I have not the means of learning, otherwise than from his paper, his opinion of printing from several negatives to obtain one picture, but I should judge that he looks upon scissors and paste as *very* disagreeable necessities; and I find that, although he upholds "the right of the photographer to do as he likes with his own," he only does so while "*he sails not under false colours*." The reading of Rejlander's paper has been a source of much pleasure to me. It was such a luxurious novelty to find *a photographer* talk about "*glazing* over some parts with a sunbeam" to destroy the effect of "*too much crude light*;" of travelling about and going to bed with his darling work, during its progress, ever in his mind; of photographing his figures from a sketch, and popping his studious face under the dark cloth to measure proportionate sizes on the focussing glass; of regulating the pressure in his printing frames; and of that glorious process—which he calls "the sun painting"—by which he uses "*a few rays and pencils of light to just glaze over*" this or that figure, and—for he talks a good deal to his "mysterious agents" while at work—having said "thank you," adding, "now please to *paint* me the background behind them;" and, as the rays do his bidding, again commanding them to "sink one of those figures deeper in the shade," even up here and touch out there; taking care all the time (because such light as he uses works quickly) to move fast and guide it well, lest there should be marks from—"HIS BRUSH." I imagined the anxious and unwearying thoughtfulness, the scheming brain, and the high ambition of this

* See *Liverpool and Manchester Photographic Journal*, 15th April, 1858.

great but really unpretending photographic printer; and thought of the pompous airs assumed by some small ones, whose "high art" consists in putting the sensitised paper into a pressure frame, taking a nap, if they please, until the print is dark enough, and then—taking it out, as far as they and the printing are concerned, finished. Despite the plasticity of photography in such able hands as Rejlander's, he is evidently perfectly conscious of the real and important difficulties of this mode of composition printing, inasmuch as he says:—"It is evident that if art were employed to give it the finishing touches, it would be more consonant with what art requires, and equally evident that an abler artist, *with better means*, could do a better thing;" and I therefore opine that his opinion and mine were not so far asunder when, in my last communication, I said that a lens commanding a wide angle of view, with clever models, judiciously chosen accessories, and a good enlarging process, were the right tools for photographic composition pieces, and not the scissors and paste-pot.

I remember, when younger than I now am, a fellow-student came to me full of indignation with Turner, who had looked at his drawing that day and praised it highly, until he (the student) began to boast, in a tone of gratified vanity, that he had done it without erasing a solitary line, when the great artist turned on his heel with a curl of his lip, muttering, "Then rub it all out, sir—rub it all out, and begin again;" and, said my brother-brush, in conclusion, "What the deuce could the old bear mean?" "Perhaps," said I, "he meant that if you could do it so well without your india-rubber you could do it better with it." Now, I look upon the presence of scissors and paste as Turner did upon the absence of india-rubber.

The above would have concluded this communication, but I cannot resist the opportunity of adding some notice of a circumstance which has occurred since it was written. Sitting in my painting-room, there was brought to me a hard, small, slightly magnified, cartridge-looking affair in paper, directed to me, and bearing the following inscription:—"Mr. Rejlander's revenge for Mr. Wall's article." Now, if I had been a nervous, timid man, I might have thought of infernal machines, and hesitated to touch this "revengeful" article sent in reply to my own. As it was I opened it, and found—what do you think?—a block of wood to symbolise the material of which my head was "composed," in the opinion of Rejlander the revengeful! Well, there certainly was a wooden block, but it preserved from injury one of the most beautiful art productions of photography with which these eyes have ever yet been delighted, representing a fine intellectual head, with the calm majesty of martyrdom in its death-like expression, borne in the charger, by which I immediately identified it as being that of John the Baptist. While I possess this gem I shall never want a proof that photography has the power of dealing with the more ambitious efforts of aspiring art. Such "revenge" really "is sweet."

ON THE SOLAR SPECTRUM IN ITS RELATION TO PHOTOGRAPHY.

[Read at a meeting of the Blackheath Photographic Society, May 21, 1860.]

By T. R. Wheeler.

(Concluded from page 163.)

Before I proceed further with a detail of these experiments and their results, I may as well complete the history of photometers (mentioning incidentally the names of J. R. M. Fane and Silbermann, the latter the inventor of the heliostate, and of M. Claudet, an experimenter in the same direction) by an account of other photometers which have been from time to time suggested, such as peroxalate of iron, proposed by Professor Draper, and modified by Dr. Woods. It will be perceived that three distinct methods are recognised in the above description: the dry method, or simple exposure of a dry sensitive surface to the action of light; the moist, where a solution of a salt decomposable by light is employed, and the gaseous where a mechanical mixture of gases is submitted to light, and under such exposure a chemical combination occurs, together with the formation of a definite chemical compound. Where a solution of the peroxalate of iron is employed, which is naturally of a golden yellow colour, and in the dark may be preserved unchanged for a great length of time; after exposure to solar, or even to artificial light, decomposition takes place, a pale yellow precipitate of protoxalate of iron falls down and carbonic gas is evolved. The amount of this may either be estimated by weight or volume, or by the weight of gold or silver which the solution *after exposure* is able to precipitate.

The following equation will show the nature of the arrangement just described:—

$$Fe_2\,O_3,\ {}_3\,C_2,\ O_3 = {}_2\,(Fe\,O,\ C_2\,O_3) + {}_2\,C\,O_2.$$

Besides the peroxalate of iron, Mr. C. J. Burnett suggested, in 1858, an actinometer, in which the fluid to be acted upon by light consisted of the oxalate of uranium in solution, and the carbonic acid gas, generated by its decomposition impinged upon a column of mercury, which rose according to the pressure in a bent tube, to which was attached a graduated scale—an ingenious and simple arrangement, and one infinitely more easy of application than that employed by MM. Bunsen and Roscoe, viz., the tithonometer of Professor Draper, but infinitely less sensitive where very great accuracy is desired.

The chemical ray, then, as has been shown, having a synthetic action upon a mixture of chlorine and hydrogen, in direct proportion to its energy and amount, it is stated by Professor Draper that the light of the electric spark, whose duration does not exceed an infinitessimal fraction of a second, will cause explosion. MM. Bunsen and Roscoe availed themselves of the fact, by submitting a mixture of these gases (prepared from hydrochloric acid by electrolysis, or the decomposition of the acid by voltaic electricity, for the purpose of avoiding error) to a known quantity of light, estimated by comparing the illuminating power of a ray reflected by a Silbermanns' heliostate through a small aperture into a dark room, with what they called a standard flame, such as the ignition of a jet of carbonic oxide of a given size produces at the distance of a metre, or 39 inches, in one minute of time; and that they called one unit of chemical action, and comparing the amount of combination of the chlorine and hydrogen, to form hydrochloric acid, which was found to take place, with many results, established the relations. I shall presently detail between the light energy in various parts of the world. The fraction of the sun's rays being calculated, it follows that the whole amount of light emanating from the sun can be found; if allowed to shine upon the instrument directly, the action would be too rapid, and the instrument shattered.

I must now quote Dr. Roscoe's pamphlet almost *verbatim*, although I condense the matter of his report.

The day chosen for experiment must be cloudless, and the observations continued from sunrise to sunset.

It would appear that the actinic power increases in inverse proportion to the column of air through which the sun's rays have to pass. In other words, the light energy increases from the time the sun clears the horizon until it has attained its meridian height, and afterwards decreases in something like the same ratio, so that there are two periods in each day when all things being equal the same chemical action is observed. "The rays, in passing through the air, are extinguished or absorbed as light; and as the sun rises above the horizon, the column of air being lessened through which the solar rays have to pass, more of the direct rays reach the earth."

The law by which this absorption of rays obtains can be deduced experimentally; and therefore, if the action of the sun at any given height is known, its action at any other height can be calculated.

This calculation being made, agrees very remarkably with the results of observation. I cannot reproduce *verbatim* Dr. Roscoe's tables, but I may be permitted to relate the general issue of his experiments conducted at Melville Island, Rejkiavik, Iceland, St. Petersburg, Manchester, Heidelberg, Naples, Cairo.

These experiments gave the light action in four forms, viz.:—

1st. The action of direct sunlight in degrees of light.
2nd. The same of diffuse daylight in degrees of light.
3rd. The same of total light in degrees of light.
4th. The action of total light in light metres.

In the latter it was found that while in Melville Island the total chemical action effected by the solar rays from sunrise to sunset, of the vernal equinox, was at

Melville Island	1306.
Rejkiavik	2324.
Petersburg	2806.
Manchester	3625.
Heidelberg	4136.
Naples	5226.
Cairo	6437.

Or five times as great, in round numbers, at Cairo as at Melville Island, and probably would be found even greater in situations nearer the equator.

I had hoped to have been able, with the kind assistance of your President, to have exhibited this evening the action of the prismatic spectrum, obtained by passing a ray of light from the poles

of a Grove's battery through a prism, upon a surface of sensitive paper, or upon a wet collodion plate. You would have then had ocular proof of the intensity of action exhibited by the various rays. As it is, I must simply state as above, that it will be found greatest at the violet end of the spectrum, and least at the red.

Now, gentlemen, it is impossible to over-rate the importance of investigations like these. To the casual observer they present a few bubbles of gas rising to the surface of a fluid—a column of mercury rising or falling the fraction of an inch—a surface of paper more or less discoloured. To the deeper thinker—to the more profound inquirer—they afford an insight into one of those agencies by which the Great Creator is pleased to regulate and control what we see round us in his Creation. In fact, we recognise in light one of

> "The vast magazine of means,
> Formed at His word, and ready at His will."

It is difficult to say where the action of light really ends. The succession of the seasons, the growth of plants, as also the distribution of those cognate groupings which constitute the flora and fauna of countries,—all have a relation, and that a direct one, both positively and negatively, with this influence; and last, not least, the physical state of mankind, and no small part of what we call hygeine, depend directly upon it. Is it going too far to say that his moral nature is likewise, in any way, under its influence? Certain it is that the human race becomes deteriorated in proportion as physical laws are neglected or permitted, and it is very hard to determine at what precise point one influence ends and another begins. Do not misunderstand me in this.

The nature of the influence which light exerts in a substance either nascent, in a state of change, or so loosely aggregated that a change may be effected in it, being molecular, leads me to say a word upon the etiolation of plants.

These, it is well known, when grown in the dark, do *not* develop the qualities and proximate principles which belong to them as members of natural orders, but are found bleached white, and devoid of colouring matter and chlorophyl. What is this but the absence of that chemical force by which molecular aggregation is regulated? It matters not whether it be the blue ray or the golden which is concerned in the agency, it is clear that an action is absent in the one case which is present in the other. Combinations of carbon and water are found indeed *without* light, but *with* it are developed those more complex arrangements which are deservedly called "organic," inasmuch as they are generated by the stimulus and under the direct control of vitality. So that it is not jumping to a conclusion, but deducing as a necessary consequence from the foregoing reasoning, by stating that there is a relation, and that a very intimate one, between light and vitality, either as cause and effect, or, at all events, as an accessory fact.

To such a point have those researches been pushed, that MM. Bunsen and Roscoe, not content with measuring the actinic force in various parts of the earth, have been actually enabled to apply that measurement (roughly estimated, indeed, but still approximately true,) to the relative chemical power of light in the various planets forming part of our solar system. Admitting its immense influence upon the organic life developed in this terrestrial globe, and admitting some analogy to exist between members of a system where harmony, order, and co-ordinate relation appear transcendant, is it presumptuous, and is it wholly unprofitable to speculate upon the states and conditions of other orbs which have this community of light influence superadded to the universally pervading law of gravitation?

True, such speculations can never wholly be verified. Still, whatever enables us to make large generalisations, by establishing relations between scattered members of a vast group, elevates the mind of man, and, raising him far above the things of time and space, give him *glimpses*—a faint perception—and that the only one he can hope for in his mortal condition, of the tremendous questions of infinity and eternity.

ON THE APPLICATION OF PHOTOGRAPHY TO SCIENTIFIC PURSUITS.

By the Rev. F. F. Statham, B.A., F.G.S.

[Read at a meeting of the South London Photographic Society, May 17, 1860.]

(Concluded from page 159.)

I come next to speak of the application of photography to *medical science*. In what way can this useful art be rendered subservient to the advancement of this all-important subject? Why plainly by multiplying accurate copies of every varying form of disease, by enlisting the camera as our most faithful transcribers of the successive changes of symptoms in sickness, and of the difficult presentments of morbid anatomy in general. At most of our principal hospitals the necessity of preserving a correct record of peculiar forms of disease has led, I believe, to the retention on the permanent staff of the institution of one or more experienced draughtsmen and modellers in wax who may be at hand to copy from the living patient, or the dissected corpse, any appearance calculated to throw a light on the origin or progress of the malady, or to form a useful object for study in the future treatment of similar classes of disease. Now, I cannot but think that even here the marvellous rapidity of execution, and the minute fidelity of the photographic picture, give it an advantage which would render the appointment of a photographer also a most desirable addition to every hospital staff; for very frequently the changes in the progress of disease are sudden and striking, and before an accurate copy of them could be made by hand the patient may die, or a successive change may come on, and so the rare opportunity be lost of chronicling some evanescent but important feature of the particular case. With the aid of the camera I can contemplate the time when every varying phase and form of disease will be as familiar in illustrated works or nosology as the real appearances now are to none but our most experienced physicians and medical men. The time of the student will not be wasted in reading long and minute descriptions of that which after all is so difficult to describe, but he will be referred to the real thing, or rather to that which is next to it, viz., an accurate photograph capable of being examined microscopically, and so furnishing almost the same advantage as would be conferred by a sight of the suffering patient on the hospital bed. But beyond this I conceive that photography may hereafter be pressed into the service of medical science for the purposes of *consultation* in cases of danger or difficulty. An accurate photograph of one afflicted with any serious malady could not but be of the utmost value to any skilful physician in forming a judgment of the case, if from the distance at which the patient might be residing it should be impossible or inconvenient for him to attend personally, or if the means were not forthcoming to pay the very heavy expenses of a distant county visit. Or perhaps having once made the visit, a photograph of his patient forwarded at intervals by the resident medical man, or by some intelligent member of the family, with a written account of the attendant symptoms, would amply suffice to one well acquainted with the usual course of the disease to enable him to prescribe accordingly, and thus reserve his time and energies for other sufferers. And this would be no small gain to society at large, for many might in this economical way have the advice of the heads of the profession in any complicated form of disease who are now deterred by the expense from applying to any other than their own neighbouring practitioner, the very multiplying of whose avocations may have prevented him from studying sufficiently the especial complaint to the care of which the physician most usually consulted has devoted the greater part of his life. In the study of *comparative anatomy* also, where the exact relation between the several parts of the skeleton is so necessary to be preserved, the accuracy of the photographic representation cannot fail to be of the highest value. The minute details of the animal frame, so difficult to copy exactly, and requiring scientific skill on the part of the draughtsman, may henceforth be faithfully represented by almost the humblest experimenter in photography, and thus may we hope that the immortal labours of Hunter, of Cuvier, and of Owen, now locked up in works of formidable dimensions and of costly price, may soon be popularised and brought within the reach of the great body of readers through the instrumentality of the camera, as the cheapest and most effective medium of illustration.

In aiding the progress of *architecture* the advantages derivable from photography are obvious. Views of existing edifices remarkable for grandeur of conception, for beauty of execution, or for comprehensiveness of design, may readily be multiplied with the utmost fidelity and with the most artistic effect. The progress of decay in many of the now crumbling memorials of the genius of a past age will be, so to speak, arrested for a time. The photographer will point his camera at each pinnacled niche or floriated doorway; he will take his sun-painted sketch of each figured corbel or grotesque gurgoylé; and, in fact, carry away in his portfolio every nice detail of the architectural design, long before Time, with his destructive hand, shall have had the opportunity to mar any more of the beauty of the original; and when future ages shall be wishing to picture to themselves the appearance of this or that abbey or cathedral long since crumbled to decay, in all its pristine grandeur, they will thank Providence for the perfection of photography in the middle of the nineteenth century, and will know at least how all the most renowned architectural remains looked

about that period when Time had as yet dealt leniently with most of them, and when a love for art, begotten anew by the means of preserving its records photographically, had sprung up with youth-like vigour among the inhabitants of our favoured land.

Henceforth there can be no need for bringing at a heavy cost sculptured effigies from Italy or Greece, chiselled obelisks from Egypt, or arrow-headed inscriptions from the mounds on the Assyrian plain. A few samples will suffice to give a general idea of the whole treasure stored up, and photographic copies of every object possessing public interest may then easily be procured, by the careful examination of which the entire history of the ruins may be read, and a correct estimate be formed of the value of the whole. At the present moment, it would scarcely be saying too much to assert that the pencil of the sun is gradually painting for us a representation of every architectural monument throughout the world calculated to awaken emotions of pleasure from its associations with the past, or from its undoubted existing artistic beauty. Our indefatigable countrymen are ascending the Nile, tracing the course of the Zambesi, navigating the Ganges, the Yang-tse-Kiang, the Mississippi, climbing the Alps, the Andes, the Himalayas, in fact wandering to every region of the habitable globe in search of the beautiful and the picturesque, and sending home for our inspection at our quiet fire-sides the fruits of their labours, in views from all the principal capitals of the world, in scenes memorable for past grandeur or glory, in glimpses of nature unwitnessed before perhaps by mortal eye, in sketches of everything that has borne the impress of human genius or skill, whether in the ruins of the sculptured temple, or the mutilated fragment of Runic carving, such as the ancient cross from Kirk Braddan, which I produce in illustration of the remarks I have made. And I think we may venture to affirm that already a perceptible improvement in the public taste has sprung up from the contemplation of these multiplied proofs of existing or past excellence. Unsightly public buildings are not quite so popular in this country as they were wont to be in the days gone by. We have been rendered so familiar with the striking features of the continental cities by the aid of photographic sketches, that we are beginning to think at least whether it is not possible to add to the architectural beauty of our own. We are gradually training ourselves to inquire whether we cannot blend the artistic with the useful in our plans for public institutions. The capitalist, who is about to build a villa or to lay out a new street, is beginning to think of the figure it will cut when photographed and exhibited for letting or for sale in the auctioneer's window; and he is perhaps induced by this consideration to employ an architect and bargain for a little display of ornamental skill, instead of confining himself as heretofore to the four solid square walls, the inevitable row of ugly chimneys, the mathematically parallel doors and windows, and the circular grass plot to pattern. But independent of the gradual improvement of the public taste in architectural matters, traceable, as I apprehend, very largely to the multiplied copies of artistic excellence produced of late by photographic agency, the architect may fairly look to the camera as one of the most useful adjuncts to assist him in the performance of his peculiar labours. By it he may, at little expense or trouble, enlarge or diminish his plans, without the aid of scale or compass. He may ascertain, if at a distance from the scene of operations, how the work of building is gradually progressing, under the charge of a clerk of the works. Nay, if the necessity of taking down and rebuilding the same edifice should exist, he may (as was lately done in America) number every stone and brick, and then photograph the building so numbered, and erect it again from the photographed plan, precisely as it was originally constructed.

But I must pass on to other applications of the photographic art. *Civil engineering*, *mining works*, and *military operations generally*, have been largely indebted already, and will, I venture to predict, be hereafter still more so, to the assistance of the camera. The drawing of plans for railways, bridges, and roadways, must obviously be greatly facilitated by correct sketches of the localities through or over which they are designed to pass. I am informed on good authority that, during the construction of the Grand Trunk Railway of Canada, it has been a matter of great advantage that the chief engineers in this country should have been able, so to speak, personally to superintend the work, almost without leaving this country, by the inspection of carefully-executed photographic plans, as it has been gradually approaching completion. And we are all familiar with the beautiful views of the Great Eastern, taken during her various stages of advancement by the aid of the camera, by which we can gradually trace her emerging from her giant carcase of iron ribs to the beautiful symmetry and perfection of her complete design. To illustrate the use of photography in this branch of science, I exhibit a view of the great Laxey Water Wheel, in the Isle of Man, by a brief examination of which any unpractical man would, by a few words of explanation, gain as complete an acquaintance with this masterpiece of mechanism as by an inspection of the actual wheel itself. In mining works it is sometimes of the utmost importance to convey to the body of directors the gradual progress of the erection of machinery, or a correct view of the appearance of a particular lode, or perhaps even a sketch of the position of the mine itself; and here again photography comes to the rescue, and furnishes a representation which may be depended upon for its fidelity, as conveying neither more nor less than the absolute state of things could warrant. In military operations the camera is invaluable for taking views of fortifications to be attacked, chronicling the effects of fire upon breaches, giving accurate transcripts of the nature and difficulties of any line of route to be forced, and perhaps even telling tales, by one momentary glimpse from a balloon, of the effective force which may be expected in the field, or revealing the whole plan of the campaign from a chance copy of a despatch, stolen by the aid of a sunbeam from a sleeping aide-de-camp's sabretache. In addition to which, we must not forget that the photographic records of past military struggles are not without their value to the student of strategetic science, and that plans of dismantled and vanquished strong places may still be useful, as offering warnings against the blunders of the past, or hints of improved modes of attack in case of future hostile operations. Fenton's series of views of the Crimean campaign will abundantly illustrate the force of my remarks, and prove, I doubt not, useful plates of instruction to those anxious thoroughly to comprehend the nature and the difficulties of that fearful struggle.

In *natural history* generally the appliances of photography cannot fail to be of the utmost value. *Zoology* will rejoice as it sees pictures of birds or animals, hitherto unacclimatised in this country, accurately delineated with all the peculiar features of the originals. *Botany* will be advanced by the easy identification of every form of vegetable life in all its minuteness of perfection by the aid of the camera. *Mineralogy* will be indebted to it for accurate copies of its choicest specimens, some of which crystallise in such complicated groups as to be excessively difficult of imitation by any other means; and the works of nature in general, such as gorgonias, sea anemones, the infinite varieties of coral marine-algæ, sponges, echinites, and other forms of animal, vegetable, or zoophytic life, will be easily represented with the assistance of photography, when before weeks and even months would have been consumed in making accurate transcripts of them. *Astronomy* already owes a deep debt to photographic art. By her aid the moon has been compelled to lend her own light in order to furnish faithful portraits of herself; the sun has, I am assured, recorded the passage of spots across its surface, and the exact appearances of a partial eclipse, and the cometary bodies have been made to leave the impress of their faint light upon the sensitised paper. It will not be presumptuous to predict that all future astronomical phenomena will be rendered more definite in their teaching by the increased facilities which the camera will afford for recording minutely their various phases, and perhaps even in the case of transits, viewed from different parts of the earth's surface, the application of photography may enable us to attain a precision and to multiply our observations to such an extent as to be of the utmost importance to the advance of astronomic truth.

ON TRANSFERRING COLLODION NEGATIVES TO WAXED-PAPER.

By M. Toulouse.

This process will be found very useful and convenient, inasmuch as it enables the travelling photographer to dispense with the greater part of his heavy, bulky, and fragile supply of glass—the constant source of anxiety and trouble in landscape photography. The negatives resulting from each day's operations can at night be transferred to waxed-paper; and when the glasses are cleaned they can be used day by day for the reception of fresh negatives. Some hundreds of transfers only occupy the space of a dozen glass plates, while the weight is reduced to a minimum.

The method to be pursued is as follows:—Take the collodion plate, unvarnished, and lay it on a flat board, then with a rule and a sharp-pointed knife cut through the film all round the edge, taking care not to damage the picture. Then take a sheet of positive paper and moisten it with water on both sides, by means of a soft camel's hair brush; lay the paper on the collodion, and

press it in every direction with a glass triangle, driving out completely the air and water from between the paper and collodion. To make sure, cover the moist paper with another piece, but dry, and press it gently down. When it is supposed to have become adherent, raise one corner, and if the collodion comes away from the glass lift it carefully. Sometimes one corner will not release the collodion, therefore if the first tried fails to do so, the other corners may be tried in succession. When the collodion film is completely detached from the glass, of course adhering to the moistened paper, lay it smoothly on a flat board, collodion uppermost. Then take a large flat camel's hair varnishing brush, and dip it into a solution of gum arabic, of the consistency of syrup, and cover with it the entire surface of the collodion. Then take a piece of waxed-paper cut a little larger than the collodion film, and lay it down carefully upon it, and press it equally all over with the glass triangle, dipped in water to prevent it adhering to the paper. When it is evenly spread, go over it with a piece of clean damp (not wet) sponge, to remove any gum that may be upon it, and place on it two or three folds of blotting-paper and cover it with a piece of glazed cardboard, fixed at the corners with pins. Then with a wooden roller go over the surface of the cardboard with a steady, even pressure. This done, take off the mass and turn it over on another board; the positive paper will now be uppermost. Then fix to the board with pins the waxed-paper, blotting-paper, and cardboard, and lift one corner of the positive paper; if the collodion film does not adhere to it, but remains attached to the waxed-paper, lift the positive paper slowly and carefully, and the collodion film will be found transferred and adherent to the waxed-paper. If such should not, however, be the case, damp the positive paper again, and in a few minutes repeat the attempt, when the collodion film will probably be found adherent to the waxed-paper. It is better to leave the waxed-paper on the blotting paper to dry, pinning round the borders four strips of cardboard, to keep it flat and smooth.

The negatives thus transferred are sufficiently transparent to yield good proofs, devoid of that extreme sharpness so prejudicial to artistic effect. To ensure success, we must take care that the collodion is of good consistency, neither too thick nor too thin—a point that can be best determined by experiment. The negative must not be varnished with the application of heat: a varnish applied cold does not prevent the transfer. The developer has no influence upon the result: either pyrogallic acid or sulphate of iron may be employed.—*Cosmos.*

STEREOGRAPHS.

Picturesque Scenery in the Vales of Tweed, Ettrick, and Yarrow, photographed by W. RODGER, *Montrose.*

WE wonder whether it would be possible for any photographer, armed with camera, tripod, and "ammunition," to pass within a moderate distance of the home of the great novelist without making a capture of the counterfeit presentment of it. Certainly we have seen as many different illustrations of ABBOTSFORD as there are months in the year at the least; and no wonder, for apart from its associations, which would be enough to redeem a bare brick wall from the charge of want of interest, it is well worthy the attention of photographers and other artists for its own intrinsic merits as regards the picturesque.

In the series before us we have three to notice, viz., No. 14, a view taken from the Galashiels Road, which gives a better idea of its exact position than any other we have seen. Located on the banks of the Tweed, and therefore in a valley, we perceive by the illustration before us that it is at the base of a fine, wooded slope, across which are seen the tops of the distant mountains, while the river stretches and winds far away on our left. In the immediate foreground is a stubble field, in which is a group of about a dozen farm labourers, male and female, some seated, some standing, but all apparently interested in something in the far distance. Although the foliage in this slide is perhaps a little too dark, it is unquestionably an admirable study for the landscape painter, as well as a welcome addition to the stereoscopic collection. In No. 15, a view of ABBOTSFORD FROM THE TWEED, the natural clouds add very much to the effect, being more heaped in rolling masses than in the preceding instance; but, though these indicate that the exposure must have been very short, yet it is evident, from the appearance of a silver birch tree in the centre, that a stiff breeze must have been blowing at the time, its ever restless foliage being somewhat indistinct, while that of some sturdier members of the vegetable kingdom on the left is tolerably well defined, though they distinctly show from their aspect the influence of the wind. In another specimen, No. 15 B, taken from the same spot, the masses of clouds are absent, but a bare-legged urchin is seen wading in the stream not far from the spectator.

HAINING HOUSE, near Selkirk, No. 10 A, is a very pleasing study, being a pretty combination of wood, water, and figures. On a point of land, around which the stream sweeps in a graceful curve, the house, shaded and backed by many stately trees, is situated. The near bank of the stream, seen across some low bushes, is fringed with pliant rushes, from amongst which a boat is being pushed off by a gentleman standing in the bows, assisted by another seated amidships, using an oar, while a third, standing on the bank, is waving an adieu.

YAIR HOUSE, No. 19, is an old fashioned though not picturesque structure, surrounded on three sides by a mass of magnificent forest trees, one splendid specimen of which is seen on the right, close against the river's bank. Good, substantial, pleasant comfort is the idea suggested by this specimen.

NEAR NEWARK CASTLE, on the banks of the Yarrow, is a slide of a totally different stamp; flat and poor it looks *out* of the stereoscope, but *in* it—"what a change comes o'er the spirit of the scene." No longer flat, no longer poor!—but rich in half-tone, richer still in beauty; the eye ranges down a picturesque grove of trees in full leaf, the branches of which interlace and chequer the vista through which the tranquil waters of the river and the wooded slope of the opposite bank are discerned. In the immediate foreground are the trunks of a couple of gnarled oaks, the bark of which is seamed and clothed with patches of lichen; farther on is the stem of a noble fir tree, then more oaks, while the long grass, cut by the pathway, brushwood, and stream, combine to make up a truly charming *tout ensemble.*

EVENING.—View taken from Selkirk Bridge, No. 13, is an effective study for the artist—the casual observer will not appreciate it. Near the spectator is a solitary figure, probably a gamekeeper, with a gun, standing in a turnip field, by the roadside. Across another extensive field are seen a few houses and farm buildings, with a plantation on the left, the background, consisting of a long slope of moorland hills. But, oh that sky! What a charm it has! How it lights up the outline of the hills! What a calm, soft light it sheds upon the landscape, which, though next to nothing in itself is glorified by the lingering smile of departing day!

MILL OF FAIREYLEE, on the Tweed (No. 16), though a capital subject, and full of all that goes to make up the picturesque, is a trifle under-exposed and over-developed. The tree is too dark and the water too white; but the rocks are sharp and bold, and the water-wheel just where it should be.

FOULSHIELS, the birthplace of Mungo Park (No. 5), though only a cluster of thatched cottages against the hill side, nevertheless composes into a beautiful subject. Located at the bend of the high road, with a by-road passing round the cottages—plantations on the right and left—a field in full crop in front and one quite fallow behind—the base of one extensive hill on the right, and the summit of another in the distance—a very pretty effect is produced with very moderate means.

With this we must close our notice of the series; but amongst a few miscellaneous slides we must mention one, called *The Game at Marbles*, where, in a back garden, two boys are busy over what in our school days we knew as "shoot in the ring," while a disconsolate-looking little lassie is seated on the window-step, appearing very much as if she would like to join in the fun, but felt doubtful of her reception.

We cannot close without intimating that, judging from the specimens before us, Mr. Rodger is a skilful operator, a capital printer, and has the happy knack of selecting judiciously his "point of view."

NEW DRY COLLODION PROCESS.

By M. PESCHARD.

COLLODION.

Ether	60·00	parts.
Alcohol	40·00	"
Gun cotton	1·60	"
Iodide of cadmium	1·20	"
Bromide of cadmium	0·02	"
Pure rosin	1·00	"

The rosin is added when the other ingredients are dissolved. Then add thirty drops of the following solution:—

Alcohol	2 drachms.
Liquid balsam of Peru	1 drachm.

Leave the mixture a couple of days to settle, then filter through cotton.

SENSITISING.

Sensitise in a neutral silver bath of the strength of eight per cent. (thirty-five grains to the ounce); next wash the plate under a light stream of water, place it to drain, dry upon folds of blotting-paper, and preserve in a box lined with black paper. The plates will remain in good condition for several days. The plate should be washed with distilled or rain water boiled and filtered.

DEVELOPING.

Water	3 ounces.
Pyrogallic acid	4 grains.
Citrate acid	4 ,,
Alcohol	1 drachm.

Previous to developing, wash the plate carefully so as to moisten it all over; then, without loss of time, pour over it the above developing solution, repeating the operation three several times; then add to the developing solution collected in a measure a few drops of solution of nitrate of silver (four per cent.), and continue pouring it off and on until the development is completed. The developing may be deferred two or three days after exposure if required.

When the plate is washed, it may be fixed with hyposulphite of soda, strength thirty per cent.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The first anniversary meeting and *soirée* of this Society was held on Thursday, the 21st ult., at the St. Peter's School Rooms, Walworth.

The room was tastefully decorated with flags, wreaths of flowers and leaves, and numberless articles of interest and novelty were placed, for the inspection of the members and visitors present, upon tables ranged along the sides and centre.

Messrs. Horne and Thornthwaite exhibited an ingeniously-contrived optical instrument, called the trocheidoscope, for displaying various combinations of the prismatic colours; some stereoscopes with a number of beautiful transparent slides, and microscopes.

The London Stereoscopic Company contributed a set of their newly-published photographs of American scenery, which were very greatly admired.

Messrs. Cotton and Wall contributed a collection of photographs for albums, others coloured in oil, and some untouched.

Messrs. Squire and Co. contributed a variety of new and improved cameras for out-door photography, and one of Leake's dark tents, the simplicity and convenience of which, combined with its singularly portable character, was highly praised.

Messrs. Shepherd and Co. sent a portable camera of a very efficient description, &c.

Mr. G. W. Simpson brought some specimens of his beautiful alabastrine process, coloured and non-inverted, which won no little attention.

Mr. Burr, F.R.A.S., exhibited a beautiful collection of photographs under the microscope, one showing the moon as produced by that luminary's own rays, and photographed by Mr. De la Rue with his thirteen-inch reflecting telescope; also a number of photographs of lunar scenery in the magic lanthorn, of which he gave a most interesting and concise explanation.

[For the courtesy, kindness, and attention of this and of other gentlemen, whose able co-operation was so generously given, the committee desire to express their grateful thanks.]

Mr. Garnham showed numerous curious and interesting microscopical results, the exhibition of a living daphnia attracting great attention, the beating of the heart and internal workings of the body being clearly seen.

Mr. W. Clark exhibited his new binocular camera.

Mr. Tear brought forward a stereograph taken by the Fothergill process, but for which, as a preservative agent, he had taken a little of the sago which had just then been prepared for "the baby." The resulting picture was very intense, and displayed good half-tone.

Mr. T. Clark displayed a variety of photographs in the magic lanthorn. For many of the slides so exhibited, thanks are due to Mr. Hannaford and Mr. Ackland.

Mr. Noldwritt exhibited some photographs coloured in oil, a globe of the moon, which illustrated very clearly Mr. Burr's description of the lanthorn slides; several interesting curiosities from India, stereographs, &c.

Mr. Wall contributed a large collection of photographs, stereographs, engravings, and curiosities.

Mr. G. Shadbolt also contributed some photographic albums, and a large collection of beautiful stereographs.

The Rev. F. F. Statham, President, sent a collection of interesting relics and curiosities from the East. Other friends also aided with various objects of interest, amongst which were some *fac-similes* of drawings by Raphael, photographic portraits, landscapes, and stereographs, &c., contributed by Messrs. Newman, Forrester (Crowquill), Mills, Howard, Smith, and others. A fine vignette picture of the *Head of John the Baptist in a Charger* was handed round by Mr. Wall, as the production of Mr. Rejlander.

Mr. Moule exhibited his apparatus for night photographing, and several specimens produced thereby.

The Rev. F. F. Statham, B.A., President, in addressing the meeting, said, that they had assembled on that occasion in the St. Peter's School Rooms, instead of their usual place of meeting, on account of the increased space thereby afforded for exhibiting the objects now before them. They were compelled to go shortly into business matters, but he would promise the ladies they should not long be detained in listening to the formal part of the evening's proceedings. He would, in few words, announce the state and the success of the Society, and the Secretary would then read the annual report, after which every endeavour in their power would be made to cause the evening to be spent agreeably. He need say but little on behalf of photography, in which the ladies were perhaps the most interested as presenting to them faithful likenesses of those who were most dear to them. But even as a gentleman he was indebted to photography for the pictures of his wife and children, so that even death itself could not take away from him those features which he so loved. They could see from the specimens before them in how many ways photography had been made interesting and of service. In various parts of London societies had been formed, and those living in the neighbourhood of Walworth would almost have been considered Goths and Vandals if they had not instituted this Society. The Society had not been in existence very long, this being its first anniversary, but he trusted that it was firmly established, and that it would find numerous supporters among those residing in the neighbourhood. They had among them several gentlemen of considerable talent, and he trusted that they would continue to meet to spend many evenings together in such an innocent enjoyment. He thought a man had a right to have a "hobby;" and he did not see why, if he took a fancy to photography or electricity, his apparatus was to be poked up in a back attic instead of being kept in the parlour. In order to avoid that, it was necessary the ladies should be led to take an interest in their husband's pursuits, and for this purpose ladies were invited to become members of the Society. In order to induce them to join, several rural excursions to places within a short distance from London had been planned for the ensuing few months, when he trusted the weather would be more propitious than it had been latterly. Of course the ladies would be placed about the scenes to be taken, and they would form certainly not the least attractive feature in the views. He trusted they would all feel that the Society was deserving of encouragement, and would do all in their power to induce their friends to become members of it. Whilst at one end of the room, food for the mind was supplied, they had taken care that at the other end refreshments of a more substantial character for the body would be administered. He would now call upon their diligent and energetic friend, Mr. Wall, to read the annual report.

Mr. Wall then read the following report for the past year:—

FIRST ANNUAL REPORT OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

In obedience to Rule 9, your Committee proceed to lay before you this their first annual report. The present aspect of the Society is decidedly promising, and we may congratulate ourselves on the apparent surety of its foundation. Our members are not large in number, but we have a very fair share of vitality, and contrive to be active in our proceedings. The meetings have been tolerably well attended; but we regret that several members, whose election raised sanguine hopes, and whose names won us public respect, have not yet "put in an appearance" on our behalf; still we console ourselves with the credit of contriving to do well without them, and the earnest hope that we may do better *with them* in the next session.

The South London Photographic Society sprang into existence on the evening of May 10, 1859, at a meeting convened by public notice, and by your present Secretary, which was attended by Messrs. G. Shadbolt, W. Ackland, F. Howard, A. Hervé, and J. C. Leake. A provisional committee was formed for the proper organization of the Society, and the first public meeting was held on the 9th of July following.

The papers read at our monthly meetings are as follow:—

Truth in Art Illustrated by Photography, by H. L. Keens, Sen., a gentleman, not a photographer, who was an artist before photography was known, and whose sympathies might naturally be supposed to be with the traditions of art, came forward in this, and one other paper, as the champion of Photography, upholding its truth, asserting its power, and appealing to it in refutation of the principles advocated by a modern vicious school of painting.

Practical Hints upon Positive Printing, by J. C. Leake, Jun.—This paper, by a very successful professional operator, affords an illustration of the real practical value of such societies as our own. Although containing hints of great utility, and evincing the result obtained by very great experience and practice, it advocated a process of printing and toning which is now generally known to be unsafe and unsatisfactory. The discussion which followed the reading of this paper was mainly instrumental in inducing Mr. Leake to abandon the old for the new alkaline gold toning bath; and as this gentleman provides portraits for a large number of customers, we may claim for ourselves the honour of having done some good service to the public in the increased permanency of their photographs.

The Difficulties of the Dry Processes, by W. Ackland, Vice-President.—This was another paper of eminently practical value, and the information it contained must have been of no little service in diminishing the chances of failure. The various difficulties were illustrated with specimens, as well as described; and, being traced carefully to their source, were accompanied with remedies which had been practically tested by the author himself.

Observations on Photographs in their Relation to Art, contributed by your Secretary, in which he endeavoured to point out the exact position photography occupied in regard to art, and to show that success in the former was largely indebted to a correct appreciation and knowledge of the latter; adding hints of a purely practical description to assist in producing results of a pictorial character.

On Recent Improvements in Photographic Apparatus, by W. Clarke.—In this the respective merits of the various cameras and other apparatus were described, and specimens exhibited.

Failures in the Wet Process: their Cause and Cure, by J. C. Leake, Jun.—The highly suggestive observations of a well-known efficient operator, who had encountered *and overcome* these difficulties, and the exhibition of about a dozen defective plates, could not but be valuable to the practical portion of our members.

The Iron-Printing Process, by M. Hannaford.—This, and several other short papers by the same author, were all upon infant processes of a promising and most important description, which offer a very wide field for experiment and research of a practical and philosophical description. We trust this gentleman may not let us want his really invaluable aid in bringing forward such papers in the coming session.

On Amateur Photography, by Frank Howard.—Our treasurer, in this excellent paper, dwelt with all the enthusiasm one might expect from a photographer so universally successful, on the delights of an art he had taken up in the purity of an amateur's love, although with a conscientiousness very characteristic of the man himself, he also pointed out, with the utmost precision, such shoals and rocks as beginners usually encounter.

On Certain Experiments with the Salts of Silver, by Mr. T. Clarke.—Although these experiments lacked the precision necessary to increase their value, they induce us to hope that this gentleman will continue others of the same practical description, if only that they may originate the discussions from which we all derive so much benefit.

On the Application of Photography to Scientific Pursuits, by the Rev. F. F. Statham, B.A., F.G.S., President.—This was an eminently interesting and highly exhaustive paper on a subject of great suggestive importance, reviewing the applications of the art to scientific purposes, and pointing out new directions into which it might be turned with highly advantageous results.

Photographic Jottings.—In addition to these more formal papers, a quantity of valuable information has been contributed under the head of "Jottings," being brief notes of experience on some special subjects of interest. For these we have been indebted during the session to Messrs. Hannaford, Ackland, Leake, Wall, and Martin. These little friends have been, and will doubtless continue to be, of the greatest importance, offering, as they do, a medium for the communication of facts not in themselves of sufficient importance to constitute entire papers, and a temptation to modest or timid members to embody a thought or incident of their practical experience, in a form so simple and unpretending.

The discussions, we are happy to add, have been numerous and animated, eliciting much useful information.

The portfolio's claims upon the generosity of members have not been neglected, but, like an importunate beggar, its continual cry is still—"give, give, give."

The Exchange Club has been duly organised, and several specimens are now in the folio for exchange. Members will be very gladly received, and it is not necessary that such should be members of the Society.

By an alteration in the rules, our usual recess will be converted into a series of outdoor meetings, intended for the benefit of beginners in the art, and for the purpose of exchanging in absolute practice hints which cannot be communicated with the same effect by mere words. Such meetings, it should also be remembered, will enable us to combine our experience, skill, and knowledge for the prosecution of various experiments of a practical character in connection with the pictorial, optical, and chemical elements of the art.

Numerous objects of interest have been brought forward at our meetings in the shape of specimens, apparatus, curiosities, &c., and your committee return the exhibitors their best thanks.

We regret that although ladies have been invited to join us, none have yet responded to our invitation. Other societies have their lady-members, and we all know that there is no lack of fair creatures whose dainty fingers are familiar with what has been termed "the black art" (in emulation of an example set by the highest lady in the land—our much loved Queen). Having good reason to believe this absence to be occasioned by the fear each individual lady, naturally enough, of always finding herself "the single lady" present, we are prepared to promise any lady who may honour us by communicating her intention of becoming a member and attending a meeting, that pains will be taken to introduce her upon such an occasion to companions of the same sex.

Your committee take this opportunity for throwing out the few hints following for the consideration of members.

It has been suggested that the formation of a permanent committee for the special purpose of testing and reporting upon the value of such improvements in processes, experiments, &c., as may be found in the various journals, would tend to point out their real value, so that they might be at once either adopted or discarded. A fund *(in the event of our increased prosperity)* might be placed at the disposal of such a committee for the incidental expenses; and at each meeting we should have a something certain to look forward to from our "experiment committee."

A complete collection of the literature of photography, periodical and otherwise, English and continental, to circulate among the members, is also a very desirable object of attainment, which our increased funds would enable us to secure.

A collection of first-class photographs might be added to the folio for the year, by the formation of a club, of which each member paid some trifling monthly subscription, and had, in turn, the privilege of naming the subject for purchase. The specimens so procured to be divided, and become the property of the members at the close of each year. Any members willing to aid in carrying out this suggestion will please to give in their names to the Secretary.

While the practical is made, as it deserves to be, a most prominent feature in our papers and discussions, your committee would suggest that theoretical and philosophical questions should by no means be neglected;—"purblind practice" will sometimes "every theoretic truth disdain, and blunder on mechanically vain," but, *as a society*, while we should not be characterised by a puffed out pride in the mere act of languidly hoarding up *embryo* knowledge, we should beware of separating elements of theory and practice which are so essential for the production of a perfect whole.

Your committee would also urge upon members the advisibility of making arrangements which will enable the Secretary to announce at one meeting the subject of the paper for the next. The representatives of this or that branch of special knowledge more directly pertaining to the subject to be discussed will then be more likely to attend, and thus improve and give increased effect to the discussions which it is so desirable should take place upon such occasions; for, it must be remembered, that photography has brought into harmonious relationship a number of apparently conflicting, or at least opposite elements, in *all* of which it is indeed seldom that we find any one or even two individuals tolerably proficient; and it might possibly happen that, from neglect of the method recommended and hitherto adopted, no gentleman was present at the reading of such paper competent to tender any observations, and thus the labour so generously undertaken in our favour might fail to meet an encouraging reception and adequate reward.

Your committee are also desirous of discouraging the habit of permitting discussion to degenerate into the low tone of ordinary conversation. If each speaker addresses, not only his more immediate neighbour, but *the whole of the meeting*, you will easily perceive that his personal views or opinions will have the better chance of being strengthened, improved, or refuted, which, as *the advancement of the art and not the individual* is the great purpose of our organisation, is of course especially desirable. Some may, from a fear of those awful beings—the reporters—hesitate to adopt our suggestion; but we can assure them that while the pith of all remarks worthy that honour will afterwards be found in print, the mere chaff of words which they themselves do not—indeed cannot—pause to separate from the wheat of sense, will, if only for the credit of the pages in which they appear, never be recorded against them These remarks of course do not apply to conversation unconnected with the subject under discussion. There are many other such hints as the preceding which might be urged upon your attention, but we will not detain you any longer with them upon this pleasant occasion.

To take a passing glance at the more prominent photographic features of the year will not demand many minutes. No great events, no very wonderful inventions, have characterised the past twelve months of our Society's existence. Steady progress in the practical departments, quiet advance towards the artistic, have been its most praiseworthy traits. Bottled light, which opened with a pop, and effervesced noisily all over Europe, seems again likely to be corked down. The alkaline gold toning bath has stolen into more general use and appreciation. The construction of lenses or their combinations have developed nothing novel, excepting a lens of an original character (Mr. Sutton's panoramic), which, together with its camera and other apparatus, was exhibited at one of our meetings, and which seems to offer great advantages in a largely increased angle of view, &c. Much, too, has been done in the way of reproduction during the year. We were delighted to find the educational authorities at Kensington had resolved to carry into the very humblest houses of the land we live in that refining and enobling influence which belongs to the real art, by making photography an instrument for the faithful reproduction of such costly works of the greatest painters as have hitherto been inaccessible and beyond the means of even the wealthiest among us. Many have, however, been looking vainly and impatiently forward to the delivery of these copies, and begin to fear that some members of the "Barnacle" family may have stepped in with their "how not to do it" system. When we consider that, aided by the camera, copies of these glorious productions can be scattered by thousands among the people, at a cost purely nominal, and that to produce one such without photography's aid would require the best talent of our greatest painters, at a cost of perhaps thousands, or at least hundreds, the importance of this step must, we are sure, be acknowledged with no little gratitude and pleasure.

Many productions of high artistic merit have been published during the year, which are especially gratifying as proofs that the almost latent pictorial power of our art, is beginning to be discovered and more generally appreciated. We may take praise to ourselves also, gentlemen, for having been one of the few, very few, societies which during the year have given due attention to the principles of art in connexion with photography, and denounced the more common and prominent offences against good taste and pictorial beauty.

One other subject, which we approach with some reluctance, remains to be noticed, viz., the collodion committee. It has indirectly done us good, perhaps; but it was certainly strange to find a body of highly talented gentlemen testing *collodions* with only *one collodion*, and solemnly and laboriously making a show of comparing *with nothing to compare with*, without referring to the invidious and ungrateful nature of their task in attempting to discover the best manufacturer instead of the best way of manufacturing. Their report reminds us of some one who (under government, of course) had nothing to do, and, with a great deal of help and plenty of time, contrived somehow to do it! But still let us thank the gentlemen forming the collodion committee for their good intentions, remembering that mistakes will occur, although it is not always policy to admit their existence.

In conclusion, we beg leave to suggest that the number in committee be increased from six to eight; that the hour of our usual monthly meeting be altered from eight to half-past seven; that as some of our members receive, in addition to that which has been chosen as the special organ of this Society, the journal pertaining to them as members of kindred associations, and do not require the two, the yearly subscription be reduced to those gentlemen, and others similarly situated, from 10s. 6d. to 5s. 6d., and that they receive for this sum the print and all other advantages of membership, excepting only the fortnightly Journal [The British Journal of Photography].

The privilege which has been granted to the members of the Walworth Literary and Scientific Institution will cease with the past year, as we have found the subscriptions paid less than the outlay incurred. In consequence of the present state of our funds, the privileges of members must cease until their subscriptions are paid in.

For the next three months your Society will only exist in the open air, "roving abroad like a bird or a bee," and like the latter, we hope, treasuring honey for the coming winter meetings. Our first out-door meeting will be held on the third Saturday in July, at half-past two P.M., at the Eagle, Snaresbrook.

The Treasurer will now read his report, after which we will, if you please, revive or recreate our newly defunct body of officers, which done, the President will gladly receive the names of any who may desire to be nominated as members.

Mr. Howard, the Treasurer, then read the financial statement, from which it appeared there were thirty-four subscribers to the Society, and that £24, 10s. 6d. had been received during the year. The balance in hand amounted to £1, 0s. 1d., which, with the subscriptions to be received, would fully discharge the quarter's expenses.

Members elected.—Messrs. Salked, Kay, Baily, Blanchard, Bunker, Neeld, Smith, Tate, Hooper, Young, Davies, Moulde, Squire, Evans, Brooks, and two other gentlemen whose names escaped us.

The following gentlemen were elected honorary members on the motion of Mr. Wall, as he (Mr. Wall) thought no photographic society should fail to do honour to itself by evincing its high respect for those who had done photography such great service in its scientific, practical, or artistic branches:—*T. F. Hardwich, Esq., O. G. Rejlander, Esq., M. Claudet, W. Crookes, Esq., R. Hunt, Esq., and Lake Price, Esq.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held on Monday, the 18th ult., at the Golf Club-House, Blackheath Hill,—the President, Charles Heisch, F.C.S., in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. Glaisher read a communication from Mr. Paul Pretsch, on

Photographic Pictures Reproduced by Ordinary Letterpress Surface Printing.

Mr. Paul Pretsch's new process, which is now brought before this meeting for the first time, is the earliest solution of the problem, whether we shall be enabled, by the aid of photography, to impress upon metal blocks for the purposes of printing by the ordinary letterpress, and with ordinary printing ink, illustrations of events and the truths of nature. The specimens produced have not in any way been touched by the graver. The inventor began with the most difficult portion of the process—the photographic originals. The great difficulty of the process will be readily understood from the fact, that there are no lines or markings in the originals, but only tints which must be reproduced on a certain solid substance from which the print is to be taken. It is interesting to know that, although the inventor is a German, the discovery was made in England. The main advantages presented by

* The Secretary thinks an apology due to these gentlemen for not privately intimating his intention of proposing them as honorary members; but the enthusiasm of the meeting did at once that which he merely intended to propose doing.

this process over the ordinary method of engraving are the rapidity and cheapness with which the impressed blocks may be produced. Where thousands of copies may be taken from ordinary engraved plates, hundreds of thousands may be printed from the blocks prepared by Mr. Pretsch. Whilst the price of an ordinary engraving ranges from a few shillings to several pounds, by the new process they may be produced for a few pence.

The superiority in favour of the new process over the old in point of time of production is as twenty or even fifty to one. The inventor states that these blocks are cheaper and more quickly produced than his former invention for producing engraved plates for the intaglio printing process. In preparing an intaglio printing plate, after the gutta percha mould is obtained, the inventor requires from three to five days for the electrotyping of the copper matrix, and for making the solid printing plate itself about ten days or a fortnight more were required; but in the production of the block for the letterpress printing only twenty-four hours are wanted after the mould is obtained. The copper deposit is made rapidly, being very thin; and it is then backed up with type metal and fixed in a block of wood, as in the specimen produced. The expense of electrotyping the blocks, compared with that of an intaglio plate, is about one to three or five, according to circumstances. The processes for intaglio and for surface printing have one and the same object. The influence of light is used for the production of the first printing plate or block; and having obtained this, the inventor becomes enabled to print therefrom with mathematical certainty, by mere mechanical means, any number of copies required. Photography alone cannot do this, for it requires the influence of light to produce each single copy; and even the various carbon and ink processes, although perhaps more durable than silver prints, require light for the production of copies. Both processes possess the advantage that their copies are printed with the ordinary printer's ink; and although the inventor is quite sure that his first process for producing engraved copperplates for intaglio printing will come into general use, and be applied to the cheap production of first-rate prints, still, considering that surface printing combines with the same fidelity of reproduction so many important advantages, we may presume that, without superseding intaglio printing, it will take its due place, and that the demand for these blocks will far surpass that for the intaglio plates. It thus appears that Mr. Pretsch has fulfilled his promise—that he would make photography subservient to the ordinary printing press.

Mr. Lucas said the new process would supply a great desideratum.

Mr. Glaisher said he had brought several prints and blocks, which he produced, prepared by the process. It would be observed that there was only a thin layer of copper on the block. The prints were wonderfully distinct and clear, and doubtless still clearer tints would be obtained by the inventor in time.

The President asked whether the process was the same as that employed in preparing the copperplates for intaglio printing, only stopping short of the final process? Had Mr. Glaisher any idea how the impression was made?

Mr. Glaisher said that, so far as he knew, a photograph was taken upon some impressible substance, and an acid was used by which some parts were raised and others depressed. From the mould so obtained he produced his copperplated block. The intaglio process had been patented, but at present the new process had not been. He believed the blocks could be produced as cheaply as ordinary wood blocks.

The President, Mr. Heisch, then introduced some photographs of fluorescent substances, kindly sent him by Dr. Gladstone, expressing his regret that he was obliged to leave the meeting, which prevented his personally describing them, but he would leave them in the hands of Mr. Wheeler for explanation.

Mr. Wheeler, Hon. Sec., took the chair, and stated that the committee appointed to secure a room for the contemplated *soirée* had sent in a report, from which it appeared that they had been unable to obtain the necessary accommodation.

The report having been adopted, it was agreed that the matter should stand adjourned *sine die*.

Mr. Wheeler stated that the offer made by this Society to present the Golf Club with a gold medal as a recognition of their kindness in allowing the meetings of the Society to be held in their rooms had been accepted with thanks.

A resolution was then moved by Mr. Harding, and seconded by Mr. Lucas, that Mr. Heisch be empowered to make the requisite inquiries, and take the necessary steps towards purchasing the medal.

Mr. Wheeler then proceeded to describe the experiments made by Dr. Gladstone relative to certain qualities of the solar spectrum with respect to photographs of fluorescent bodies. He claimed the indulgence of members for any shortcomings he might exhibit in dealing with the subject at so short a notice. He said, members were doubtless aware that, independently of the colours exhibited by the prismatic spectrum to ordinary vision, there existed to some extent throughout the spectrum, but at and beyond the violet end chiefly, invisible rays, termed extra spectral. Stokes had discovered that the bluish opalescent appearance manifested by a solution of quinine, when viewed in particular lights, and also the opalescent appearance of glass, coloured yellow by oxide of uranium, was due to the fact that these bodies had the property of reflecting and at the same time so altering the refrangibility of these rays as to bring them within the range of human vision: substances having this property have been named *fluorescent*. When viewed by ordinary lights, these bodies exhibit little or no peculiarity of appearance, owing to the number of ordinary luminous rays reflected equally from them and surrounding bodies; but, if illuminated by light that has passed through a violet-coloured glass, which contains few of the more luminous rays of the spectrum but the whole of the invisible rays, owing to their property of so altering the refrangibility of these rays as to render them visible, they appear in comparison with the ordinary bodies around them to be almost self luminous. Other lights, containing few of the more luminous and many of the invisible rays, may be used to exhibit these phenomena, and on that occasion he employed the light from sulphur burned in oxygen gas, when characters traced on writing paper with various substances, which by ordinary light were scarcely visible, became beautifully luminous. Other bodies possessed of the power, besides quinine salts and uranium glass, had been since discovered, those sent by Dr. Gladstone being disulphate of quinine, sulpho-stilbate of barytes, cumenate of potash, and esculine, the active principle of horse-chesnut, and chlorophyl. Mr. Wheeler then proceeded to remark that the chemical action of the spectrum was greatest at that part which contains most of these invisible rays. Without going so far as to assert that these rays are actually the *chemical rays*, it had occurred to Dr. Gladstone that the alteration of their refrangibility might also deprive them of their chemical action. Experiment proved the conjecture to be right, photographs of the fluorescent characters being undistinguishable from those of characters in ink. This was particularly evident in the photograph of some letters cut out in white paper, soaked in the fluorescent bodies, and pasted on a paper coloured blue by cobalt: in the photograph the letters appeared black on a white ground. These experiments are particularly interesting to the photographer, as establishing another link between the chemical and Stokes's rays. Mr. Wheeler concluded by stating that he was glad to have the opportunity of extending the subject he had partially unfolded to them at the last meeting of the Society, viz., the phenomena of light.

Mr. John Harding proposed a vote of thanks to Mr. Wheeler for his *impromptu* discourse, which was seconded and carried, and the meeting was adjourned until October.

LIVERPOOL PHOTOGRAPHIC CLUB.

The sixth meeting of the above Club was held at the residence of the Rev. Thos. Banner, on Tuesday, the 12th ult.

Miss Bahr, whose name has become deservedly famous for her admirable pictures by the Fothergill process, and of whom such honourable mention was made in connexion with the Exhibition of the Society of Fine Arts, presented several striking proofs from the above process. She attributed her uniform success to the extent to which the washing of the plates had been carried in their preparation. On taking them from the bath the washing was not limited to any stipulated quantity of water, as in every former case, for as much as two jugs of water had been lavishly poured upon each; and the solution of albumen, so weak as one part to seven of water, having been poured on, the same copious washing was again applied; they were then drained and dried with a moderate heat: the exposure had been generally six minutes, in a very bright light. Every specimen went far to sustain the position this lady has attained in the art, and were especially remarkable for sharpness of detail and minute definition. The contrivance of her camera admitted of the lateral shifting of the back, so as to bring every object, whether distant or near at hand, into accurate focus. A very artistic picture of *A Village Church near Conway*, represented the Little Ormeshead, not less than five miles distant, as distinctly as objects in the foreground.

Mr. Glover exhibited some very fine negatives from collodion with the resin, according to the mode prescribed by the Abbé Depratz. He had slightly departed from the original plan by dissolving one grain in two ounces of rather tough collodion, then soaking in a large quantity of water, frequently rocking the dish containing the plate.

The sensibility of these plates constituted their main charm, for in every other method of using preserved plates the exposure required is nearly as long as for waxed paper. In all these instances the exposure was nearly as brief as for moist or fresh plates—the stereoscopic size requiring only twenty seconds. They were sensitised in a rather acid bath, containing about five minims of glacial acetic acid to each ounce of the silver solution. The development was proportionately rapid; but the fluid was of the strength of three grains of pyrogallic acid to each ounce of water. This was managed under very peculiar circumstances: having elicited by a partial development, by means of a weaker solution, viz., one and a-half grains to the ounce, that every minute particular of the object had been fully though faintly brought out, the plate was cleared with cyanide, thoroughly washed, and when com-

pletely dried set aside. At leisure these plates were again moistened, and a further development carried on until the full force and depth required were entirely obtained. These specimens were singularly free from the usually objectionable hardness of dried plates, as they had much of the rich quality of recent or wet plates.

The Messrs. Cook brought forward some more of their very excellent waxed-paper negatives, which were taken, during a tour to Haddon Hall, under all the unfavourable condition of the weather of late. As there was very little sunshine many of them were exposed three quarters of an hour, yet were all of the very choicest description.

Mr. Corey complained severely of the great difficulty of obtaining albumenised paper of first quality. He had been kindly supplied by a house in this town who were celebrated for the excellence of the paper heretofore, but they, as well as himself, had been grievously disappointed with the pictures produced from it. Further application to other warehouses procured the like want of success: it was nowhere to be obtained in the town, and the photographers in Liverpool were left without a supply, unless they had recourse to London houses, and then the only reliable paper, viz., the Papier Rive, could scarcely ever be obtained with certainty.

The usual cordial interchange of experience and information was strikingly evident at this meeting, which separated at a late hour, after requesting Miss Bahr to honour them by becoming a member of the Club.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on the 13th ult., at the Chorlton Town Hall,—Mr. Wm. Griffiths, Vice-president, in the chair.

The Secretary read the report of the last meeting, which was confirmed. Afterwards he stated that some members had waited upon him relative to a report which appeared in the *Manchester Examiner and Times*, on the opening of the exhibition, Peel Park, which stated that the photographs there exhibited were the production of members of the Manchester Photographic Society; and as some of the members of this society had contributed pictures, they wished the report should be corrected. Agreeing with that wish, he had written to the curator of the Peel Park Museum, and had received a reply, which stated that it was quite immaterial to the committee who were the artists, and requested the Secretary to write to the editor of the *Examiner*. That paper has since published your Secretary's letter, which states that the Chorlton Society has contributed to that exhibition.

The meeting approved of the Secretary's conduct in this matter.

Mr. John Fawcett said he had brought a small quantity of composition that he used for producing the artificial light mentioned at the last meeting. He did not think it would be very interesting at this season of the year. It was difficult to experiment with this composition, as he did not like to use a lanthorn, being afraid of some imaginary patentee running foul of him; and when he used it in the way he should describe, there was quite a commotion near his house in consequence of the great light. He had intended to take a picture to show to this meeting, and had arranged with a good sitter for the purpose. He had arranged for three fires outside his gallery, ready for lighting in their proper positions. His wife was ready to assist in the lighting, the sitter was arranged, and all preparations completed to expose. The fuses were then lighted, and the exposure commenced, when immediately a person in bed in a room across the street, alarmed at the light, jumps out of bed, dashes his head through a pane of glass, raised an alarm which caused a commotion in the street, and disturbed the sitter, although he was a practised one! All this occurred in less time than it has taken to describe it. Of course he was unsuccessful, and regretted that the specimen could not be shown to the Society. The exposure required was about four seconds. Before the close of the meeting he would light the composition, and if any gentleman desired it he would give him the formula; or if any gentleman wished to try the experiment, he would be glad to supply him with a small quantity sufficient for the purpose.

A discussion followed on the advantages of the oxy-hydrogen lime light in comparison to this, which was raised by Mr. Hooper; but Mr. Fawcett assured the meeting that he would only think of using this light for pictures direct, as the expense of copying by this light would debar its use, and the light from the oxy-hydrogen light was insufficient for direct pictures.

The Secretary was requested to prepare a list of the members, to be filled up by them, to show the processes that each member was acquainted with for reference at the future meetings.

It was proposed and carried that an extraordinary meeting of the Society be held at the Peel Park Museum, to discuss the merits of the exhibition, on the following Saturday. Several members assembled on that day, and after spending some time in examining the pictures, retired to tea. They afterwards agreed that the following pictures were worthy of special notice, Mr. Mudd's prize picture and the productions of members not being included in the criticism:—*Cæsar's Tower*, Mr. H. Thorpe; *Slate Quarry*, Mr. J. L. Davies; *At Bettwys y Coed*, Mr. W. T. Mabley; *South Stack*, Mr. G. Higgins; *Bridge over the Lune*, Mr. H. Thorpe; *Whitby Abbey, Interior*, Mr. Crompton; *Carnarvon Castle*, Mr. E. Mann; *Tubular Bridge, Conway*, ditto; *On the Irwell*, Mr. Alfred F. Smith; *Ambleside*, Mr. G. Wardley; *Bettwys y Coed*, ditto; and *The Hostelrie*, Mr. J. L. Davis.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

You have now to continue your work until you have obtained the requisite degree of finish, roundness, and force of effect.

Although I have described the painting of the head first, you should have got in progress other portions of the picture, as, when all parts advance simultaneously, there is less chance of mistakes in the *chiaroscuro*, relief, or arrangement of colours. The background may be washed in with any of the following colours or mixtures: —

FOR A GREENISH BACKGROUND.

Burnt sienna and Prussian blue.
Blue, burnt umber, and raw sienna.
Yellow ochre and indigo.
Sepia, gamboge, and indigo.
Indigo and gamboge, with or without a little burnt sienna (as the *photographic* background may decide).
Yellow ochre and lampblack.
Lampblack and gamboge, &c.
Raw sienna and cobalt.
Bistre and Prussian blue.

FOR A SKY BACKGROUND.

Indigo and cobalt.
Cobalt and madder pink or French blue.
Prussian blue and madder lake.
Cobalt, madder pink, and Chinese white (used thin).

FOR CLOUDS, HORIZON, ETC.

Yellow ochre, rose madder, and cobalt.
Sepia, rose madder, and cobalt.
Lampblack and indigo.
Black lead.
Sepia and cobalt.
Lampblack and lake.
Payne's grey.
Vandyke brown and indigo.
Vandyke brown and raw sienna.
Raw sienna.
Raw sienna and brown madder.
Yellow ochre alone, and with brown madder.

FOR WARMER BACKGROUNDS.

Raw sienna and Vandyke brown.
Sepia and brown madder.
Purple madder.
Burnt sienna and sepia.
Raw sienna, brown madder, and indigo.
Light red and sepia.
Brown madder and indigo.
Indian yellow, burnt sienna, and indigo.
Lampblack and lake.
Sepia and purple madder.
Vandyke brown.

FOR A COOLER BACKGROUND.

Lampblack and French blue.
Lake, indigo, and Indian yellow.
Payne's grey and burnt sienna.
French blue, brown madder, and burnt sienna.
Vandyke brown, lake, and indigo.

I have given you these mixtures, but their proportions and selection must of course rest with yourself; and you must be guided by the effect you wish to produce in making the last or mixing the first, remembering that your picture's artistic value is dependent, to a great extent, upon a judiciously-managed background. (See maxims).

Say, you are working a greenish background—well, you have to avoid making it of too uniform a colour, too cold or too flat (from the want of light and shade); and having laid on your wash, and evened it up, if necessary, with a hatch or stipple, or both, continue to work upon it until, without appearing to be perfectly unconnected with the figure, it throws the portrait well before it by its quiet and retiring character. That it may look as little like paint as possible (see maxim 52) hatch different colours over the whole, making it warmer or cooler here and there, as the colour of your drapery or nature of the subject may suggest. (See maxim 53). A dark background produces the most forcible effect, but it should not be so dark as to kill the deeper shadows of the flesh.

Or, supposing you desire a sky background, begin with your wash, and hatch or stipple it into various gradations of light and dark, warm and cold, working in clouds, if desirable, by leaving the space for them untouched by the first wash, and then touching them in with the colours given for the purpose. These clouds frequently enable us to extend the light or dark; to vary the colours, or repeat "bits of colour" which might otherwise appear patchy. The first wash should always be more pure and bright than it is intended to remain. Every mixture of colour for the washes should be made with due reference to the cold or warmth, and the light or dark character of the photographic ground you are about to cover. For a sky background it should be light.

When the background is so good in the photograph that it is merely desirous to change its tone, a clean, clear, simple wash will answer. There is a pigment prepared from red chalk which washes with singular smoothness and flatness, but which is not kept by all colour makers.

Opaque backgrounds may be secured with washes of body colour, which are usually thus applied. The tint is mixed with as little water as possible, in order that the colour may not be too fluid; and the mixture must rather be too dark than too light. The background is slightly damped, and the tint applied as a wash. You must be very careful not to go twice over the same spot till it is quite dry. A very good colour is made with ochre, lampblack, and Chinese white. I do not admire, however, nor recommend opaque backgrounds. Such grounds may be also obtained by rubbing in powdered crayon with the finger. If your subject be pale, that pallor may be prevented from appearing unpleasantly ghastly by causing your background, with contrast of colour, to give it warmth. If too red, by the introduction of some accessory of a brighter and more powerful red you may make it appear less strikingly so. If too brown, you may improve its aspect by introducing stronger and more decided browns in the background, and so on, without at all violating the truth of nature.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

J. S.—The colours you have, but do not recognise under their ancient cognomen, are however the same as we now use. The French colours may be very easily re-christened with English names. The "Precipité d'Or Rouge" may be imitated with carmine and black. You have put too much white in your colour. Perhaps the magnifying lens may be useful, but it should not be taken up until you perceive with the naked eye nothing more to be done.

North London.—Yours is the best picture any pupil of mine has yet sent me to criticise. Persevere, and your present master is likely to become your pupil, for he will never be "too old to learn," he hopes, till he is too old to live. More roundness is wanted. The background is too coldly and purely green. By deepening the cast shadows you would perceive at once that there was a general want of force and effect. The jewellery is ineffective from a want of shadow and too many high lights.

Foreign Correspondence.

Paris, June 25, 1860.

I will begin my letter by replying to the question about Disderi's card-portraits, which your correspondent, "T. R. A.," addressed to me indirectly in the last number of The British Journal of Photography. I have long known Disderi. On his arrival at Paris, some six years ago, he brought me his first attempts, and I immediately predicted the success which he at present enjoys. I have often seen him operate; but, wishing to reply with more exactness, and to ascertain whether any changes had been made in his method, I went to his rooms yesterday. I found the crowd in them as numerous as it always is, and it was not without difficulty that I gained access to his operating-room. In my presence he took four portraits in the space of twenty minutes, giving to each model two different attitudes. The objective that he makes use of is a four-inch Voigtlander. He places it at about eight metres from his model. Each glass moves in a grooved frame, and serves him for eight clichés. The exposure yesterday—at five o'clock in the afternoon, and with cloudy weather—lasted from ten to twelve seconds. Disderi develops with protosulphate of iron, and, to give more vigour to the picture, he pours over it a small quantity of three per cent. solution of nitrate of silver. He fixes with hyposulphite of soda. Such is, in substance, the process employed by this talented operator. Of course, the artistic skill with which he places his model in good attitude and in good light, counts for much in the beauty of the results obtained; but that skill is to be taught by good taste and experience, rather than by rule.

Several of our principal portraitists, and, amongst them, Pierre Petit (the rival of Disderi for visiting-cards), and Mayer, Brothers, and Pierson, employ for this kind of portrait a new apparatus, which they find very convenient. It is a dark chamber, opening and shutting in accordion fashion, or like a telescope, and divided in the interior into four compartments, with four objectives, each of which represents, within a few millimètres, the dimensions of the card. Instead of the ground-glass, there is a multiplying frame opening into two parts, and allowing the glass, which is contained in it, to receive the impression of the light by the four objectives at the same time, and upon one-half only of its surface. The frame being slid on in its groove, the second half of the glass receives its impression in the same manner, so that the operator can give the model two sittings in one. Thus, in two exposures, eight portraits can be obtained on the same glass. The economy of time resulting from this system will be at once understood—an economy of time not only in the obtaining of negatives, but also, and especially, in the printing of positives. The apparatus is due to M. Hermagis.

I trust that, whenever the occasion offers itself, your readers will put such questions as the foregoing: it will be a real pleasure to me to answer them. On my side, I shall frequently have to ask for information on behalf of our French photographers. I think that such interchange of practical knowledge between the artists of the two countries will be profitable to all, and that it is the duty of the press to encourage it.

The meeting of the French Photographic Society, at which I was present, responded but imperfectly to the promises held forth in the programme. Experiments were made by M. Wulff similar to those made last year by Mr. Moule before the Photographic Society of London, if I remember rightly. The illuminating powder employed was the same in both instances. It gave a steady and very intense flame, but unfortunately produced thick vapours. In the ante-chamber was arranged the apparatus, consisting of a large lantern, provided in front with a blue glass reflector to diffuse the light, and in which a rapid current of air was established by means of a tube communicating with one of the chimneys. A collodion glass was put into the camera placed below the lantern, and the powder was then lighted. The exposure lasted about seventeen seconds, one of the persons present acting as model. The result of the first attempt was null, and, on the second trial, a very feeble positive picture was obtained. It is much to be desired that the system should be perfected; for, although it is obviously useless to operate with artificial light whenever we can employ the light of day, yet there are circumstances in which such means might render great services, as in the case of monuments below the ground, and of the curious grottoes found in certain mountains, the marvellous aspect of which could not otherwise be reproduced; and also for interiors that are insufficiently lighted.

M. Bertsch presented a very fine picture of about eighty by sixty centimètres, obtained from a stereoscopic view of M. Ferrier's, by means of his amplifying apparatus. This apparatus differs from Woodward's solar camera in the following manner:—the rays brought into one pencil by the magnifying-glass are then rendered parallel by a concave lens which transmits them upon the whole surface of the cliché.

M. Girard submitted to the meeting a picture obtained on a sheet of paper waxed and sensitised, which had been enclosed for a whole year in M. Marion's preserving apparatus. The image was not so perfect as it would have been, if operated on immediately after the preparation; but as it is not necessary to wait a whole year, even when we are travelling, the result is very satisfactory. Much interest was also excited by several specimens of M. Paul Pretsch's typographic printing process which the inventor had sent to the Society.

I think I have given you about the whole of the proceedings of the meeting. I pass over the private conversations and the claims of priority which do not concern me, and I add, in conclusion, that two able photographers, MM. Bisson and Tournachon (the brother of Nadar), are installed, with arms and baggage, at the *Concours Agricole*, open at the present moment in the Palace of Industry, in the Champs Elysées. The administration has entrusted to them the photographing of the prize animals at this *concours*, and has divided the labour between them. Their tents are erected in the Exposition itself, and the police guard the entrance against the too curious crowd. Thither are led the lusty oxen and gentle heifers, the mettlesome horses and phenomenal sheep, and last, though scarcely least, the prize pigs, grown powerless from force of fat. It requires a rapid manipulator to seize the favourable

moment for photographing these moving models not unfrequently startled at the sight of the objective pointed at them, the difficulty would be greatly diminished if the sun would but shine out, but he persists in hiding himself behind a thick veil of rainy clouds. However, I have seen these artists operate and succeed in spite of the obstacles to be surmounted. I will add that one of them, M. Tournachon, successfully discharged similar duties in 1856. His collection of types of breeding animals, engraved in part by M. Riffaut with M. Nièpce de Saint Victor's heliographic engraving process, is one of the most remarkable works which photography has hitherto produced. ERNEST LACAN.

New Books.

Photographic Apparatus, Processes, &c., &c.
Murray & Heath, Piccadilly, London.

This is *not* a catalogue, as its designation might lead one to expect; and though published by a well-known firm connected with the commercial phase of photography, and for the legitimate object of placing prominently before the public the articles in which its members deal, it contains some useful information to photographers generally, even to those well skilled in the art, and is well worth procuring. We find here and there extracts from this Journal, but with our oldest title of *The Liverpool Photographic Journal* affixed thereto. Is it possible that the compiler was ignorant of the change of designation adopted of late? If he thought our opinion worth quoting he might have given us our proper title. Little Bob expects to be called Robert when he grows to manhood. In addition to useful reprints, there is a fair share of valuable original matter contained in this pamphlet, in proof of which we give the following extract relative to Mr. Macnair's mode of preserving dry collodionised plates by the aid of an infusion of malt—a method that has been found very efficacious in the hands of those well able to judge of its merits:—

MR. MACNAIR'S MALT PRESERVATIVE PROCESS.

"We are enabled, by the courtesy of Mr. Macnair, who writes to us as late as yesterday, to mention here the experiences of himself and friends, among whom are some of the best amateur photographers in Scotland; It has resulted from experiments that the infusion of malt as described in the journals is needlessly strong. Mr. Macnair writes—'*Three* or *four* ounces of malt (instead of seven) to twenty ounces of water will be quite strong enough, and it has also the advantage of being easily washed off.' For larger or smaller quantities, of course the malt and water will be used in like proportions to the above. Mr. Macnair adds—'An objection to this process has been made, because the infusion of malt does not keep longer than a few days, but I do not think that is of any consequence, as it can be made at any time in small quantities, about as easily as a cup of coffee.' The easiest way to make the infusion, is to pour the water when nearly boiling into a common earthenware tea-pot, and mix in the ground malt when the heat has fallen to 180°; then place the tea-pot before a moderate fire, from which it should be removed, and the infusion allowed to cool slowly, as soon as it has acquired a *slightly sweetish* taste; if allowed to become *too sweet*, it does not dry hard and firm on the collodion film, but keeps sticky, and applying heat makes it more moist.

"The plates, which should be particularly well cleaned, and care taken to avoid dust, are to be coated and sensitised in the ordinary way, and the free nitrate of silver washed off at a tap, or with a jug, finishing with distilled water. The free nitrate will have been got rid of, when the greasy appearance which the plate has when the water is first applied is entirely removed; the plate will then be sufficiently washed. Rest the plate for a few seconds on blotting paper, and before it begins to dry, pour over the malt infusion the same way as collodion; wipe the back of the plate, and then dry (the quicker the better); this may be done by placing the plates in a box before a fire, ranging them in a slanting position, with the end from which the collodion and preservative coating were poured uppermost, and the coated side inwards. A large earthenware bottle, filled with hot water, placed in the box will greatly accelerate the drying, it is a good precaution, particularly for beginners, to touch the edges of the plate with varnish, applied with a small camel hair brush, after the coating is quite hard and dry; this lessens the risk of the collodion film breaking away while the preservative is being washed off.

"The time of exposure for taking views may be reckoned the same as wet collodion.

"After exposure, wash off very thoroughly the preservative coating, letting the water flow from the centre of the plate towards the edges; then, using a plate-holder, dip the *face* of the plate in a solution of nitrate of silver, of the strength of ten to fifteen grains to the ounce of water. Develop with the strong solution of sulphate of iron, as given in the last formula in our article on developers, and intensify, if necessary, by the solution of pyrogallic and citric in the manner previously described for this purpose.

"The science of malt as a preservative Mr. Macnair some time since thus explained:—'In the course of some interesting remarks on the changes grain underwent in the process of malting, he stated that the malt in a dry state contained gluten, gum, starch, and a sugary matter which did not crystallise, and which he believed could not be crystallised without sulphuric acid, or by some other chemical process; that when an infusion of ground malt was made at a proper temperature, a rapid conversion of the starch, as well as nearly all the gluten and gum, took place, and the whole was changed into a new sweet matter; that the conversion could be checked at any stage, and that the best state for the purpose was when the infusion, when dried upon the plate, was *least deliquescent*, and contained only sufficient quantity of this grape sugar to allow it to be readily washed off the plate after exposure.'"

A Complete Set of Adhesive Photographic Labels, of nearly 100 *varieties.*
Horne and Thornthwaite, Newgate Street, London.

This is a little book that we feel very much inclined to "cut up," and the chances are decidedly in favour of our gratifying such inclination. It cannot be regarded as light reading, and the character of the type is unusually monotonous, though sufficiently marked and legible. Lest our readers should be under the impression that we are just now in a particularly savage humour, we may remark that this "book" is intended for being "cut up," not figuratively but literally, and consists solely of useful labels, ready for being affixed to the various bottles belonging to the photographic laboratory.

Curiosities of Science. Second Series. By John Timbs, F.S.A.
(Kent & Co., Paternoster Row.)

We remember that, in the early days of our connexion with the Art of Photography, when journals devoted to the subject were still in the womb of the future, we used to make a point of securing Mr. Timbs's New Book of Facts, as in it we were sure of finding all the new facts relating to the infant science that had been made public, no matter where, during the preceding twelve months, Mr. Timbs being an indefatigable collector. We cannot, however, undertake to criticise in these pages any work not having a direct bearing upon photography; and therefore can only say, that though we find many amusing anecdotes relating to science generally, the work before us does not properly fall within our scope. We find, however, the following in relation to an agent much employed by photographers—chlorine:—

"Discovery of Chlorine.—At the close of the last century, the Swedish chemist Scheele made a series of experiments on the black oxide of manganese. To some this might have seemed an unprofitable waste of time; but what was the result? Chlorine was discovered, a substance of the greatest importance in the arts. Berthollet finding that this gas changed the colour of the corks of the bottles in which it was confined, suggested its employment as a bleaching agent. This led to a total revolution in the art of bleaching, shortening the process from several months to a few hours."

TO OUR READERS.

To meet the additional expense incurred for carriage and postage of this Journal throughout the Provinces, arising from the great bulk it has now assumed through the increased amount of matter published in each number, our Provincial Agents will be compelled to charge this and all future numbers at 4d. each. The price to purchasers in London and Liverpool will remain the same as at present, namely, 3d.; and subscribers can still have it forwarded direct from the publisher as heretofore upon payment of 8s. per annum IN ADVANCE.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

PHOTOGRAPHIC GOSSIP.

No. III.

To the Editor.

Sir,—Referring to your leader of 1st proximo, I do not subscribe to the remark that I had thrown a stone at the practice of printing a proof from several negatives, combining portions of each. On the contrary, the last words of my letter were—"I certainly advocate printing from several negatives, but let them be legitimately obtained." So far, then, we can scarcely be said to differ; but, in endorsing Mr. Robinson's principles, you advocate that which I contend to be injurious to photographic art. A small stream of water from a print-washing machine is a sorry apology for a flowing river, with its beautiful reflections and sweeping eddies. The addition of a handful or two of stones and gravel makes it a very untruthful substitute for the bed of a rocky river, with its water-worn boulders. The deception is, as you say, an "admitted" one; but it is not, as you also say, an "agreeable" one. Fenton and others you name do not adopt such a method. In the composition, *Don Quixote*, Lake Price does not take a boy, and, borrowing a beard at his barber's, by some dodge or other distort him into a man. He is too truly an artist for that. Rejlander, in most of his unsurpassed compositions, follows truth closely enough; but when he departs therefrom he pays the penalty—as, for instance, the total loss of all effects of atmosphere and distance, so that a woman supposed to be watching, through a window, her husband toiling up a hill, really conveys the idea that she is looking at a picture stuck on the wall a few feet off. Enlarging a correct model is *not* departing from truth, and, therefore, if Rejlander cannot procure a column or archway, &c., large enough for his purpose, he is perfectly justified in bringing his camera near, so as to enlarge a small one, but he must not attempt to get distant (?) scenes in his back yard. I am quite ready to admit that Mr. Robinson's deceptions are very clever, but would greatly prefer seeing his talent directed to the production of such compositions as his first, *Fading Away*, a work of which any photographer might well be proud.

I cordially coincide with most of the sentiments in Mr. Wall's article in your last number, but I would allow the photographer the same license as an artist claims. He may even employ "dodges" to a liberal extent, and although I cannot say exactly *where* the line should be drawn, it would certainly be a long way short of throwing up a heap of rubbish in a back yard and calling it the top of a mountain!

I am, yours, &c., MICHAEL HANNAFORD.

[In replying to Mr. Wall's objections, we have already answered most of those made above; the remainder our correspondent himself refutes. It is (according to his own doctrine) allowable to *enlarge* a model. What proof has he that the "model of a mountain" was a "mere heap of rubbish," and not truly a *model* of the *top* of a mountain? Again, in *Nearing Home*, the "distance" exhibits a considerable degree of atmospheric effect. We are a little puzzled to understand how our

correspondent can "cordially coincide" with Mr. Wall's recent article which is specially directed *against* the use of several negatives for one composition, while he himself professes to "advocate" the practice. We have no doubt of Mr. Robinson's negatives having been "*legitimately* obtained," and do not for one moment suppose that our correspondent would suspect him of having *stolen* them.—Ed.]

FADED POSITIVES ON GLASS, CARBON PRINTS, &c.

To the Editor.

Sir,—Having devoted much of my attention to the photographic art in all its varied branches for several years past, I may very naturally be expected to have stumbled on, at least, many of its discouraging interruptions. By carefully retracing my steps, I have generally been enabled to set matters right again; but in the case I am about to trouble you with I have thus far failed of my usual good luck. In the hope that the superior knowledge of yourself, or of some one of your numerous correspondents, may more readily see through my difficulty (perhaps from having been similarly circumstanced), I am induced to bring before your notice the following mishap:—

1. Working for two years past entirely in the positive glass process, I have always found the high lights of the picture to have preserved their purity most perfectly, and without the slightest change of colour. Lately, much to my disappointment, I have been shown two proofs (and there may be others scattered about the neighbourhood) which have taken on a deep saffron-yellow colour, the discolouration being confined principally to that part of the picture exposed to light—that part covered by the matt being very much less changed in appearance. Three other proofs taken at the same time as one of these, of the same person, and with the same chemicals, and, I believe, protected by the same varnish, still remain unaltered. Anxiously hoping to be obliged with an explanation of the cause of the above annoyance in an early issue of your most useful periodical, I will trouble you no further on that subject.

2. Very recently I have found that the flooding of the glass positives, with one part of albumen to three or four of distilled water, has produced a better surface for receiving powder colours than that of the bare deposit of silver. Is it possible that the phosphorus or sulphur contained in the albumen may be the cause of a decomposition taking place, and consequent discolouration of the picture? I recollect reading somewhere very lately, in a photographic periodical, of paper proofs having quickly faded in consequence of having been varnished with albumen. I should have stated that, at the time of taking the pictures which took on the above described undesirable change, I had not commenced using the coating of albumen.

3. The print kindly presented by M. Joubert to the subscribers of the *Journal of the Photographic Society* with its last number is certainly very beautiful. It is full of half-tone, of a rich sepia brown, with its high lights perfectly clean and white, and free from that coarseness or roughness of surface usual to all former carbon prints. In short, to my mind, as far as its present appearance goes, it is perfect, and quite equal to a silver printed proof. Of course photographers (and the public too) must wait patiently, in the hopes of eventually being favoured by M. Joubert with the generous publication of his process, as led to expect it is his intention of doing. In the meantime, I think M. Joubert would be conferring an additional favour, more especially on the amateurs of our fascinating art, if he would inform them whether the proof in question was printed by means of light in the ordinary way of taking a silver proof, direct in the pressure-frame; or whether the negative used was first prepared by some galvanic process, and the proof taken in the printer's machine used for printing engravings. The last method would necessarily be only applicable where a number of copies were wanted, the first being more especially suitable to the requirements of the amateur—and a boon indeed it would be to photographers generally.

One query more and I have done. Can you kindly oblige me with a detailed method of making artificial ivory, as used for taking positive pictures on? or, what would be still preferable, where the article could be obtained ready prepared in sheets, and fit for immediate use?—I am, yours, &c., HENRY H. HELE.

June 18, 1860.

[1. Is it not possible that in the case of the positive which changed colour, where the albumen was not used, your fixing agent (cyanide or hyposulphite) may have been nearly saturated, and thus have left behind a very small portion of iodide or bromide of silver, which did the mischief? This would account for the same chemicals not failing in previous instances.—2. We should think albumen a dangerous varnish for positives. It is, however, not improbable that if properly coagulated it might be harmless. To this end, immersing it in a solution of protosulphate of iron after drying, and washing thoroughly, may be effective.—3. M. Joubert's carbon print is by far the best we have seen of that kind of work. Our own copy happens to be a poor one—dull and flat: we have seen those which are much superior produced by this gentleman; but still, in our opinion, a long way behind a good silver print. It has already been stated by M. Joubert that each proof is produced *in the pressure-frame* by *exposure to light*.—4. Artificial ivory is composed of albumen and sulphate of barytes, but how combined we do not know. It was introduced by Mr. Mayall, of Regent Street, by whom, we believe, a patent was taken out for its manufacture.—Ed.]

CAUTION TO OPERATORS ANSWERING ADVERTISEMENTS.

To the Editor.

Sir,—It is high time some caution were given, through the medium of photographic publications, respecting the advertisements of parties requiring first-class operators, either for the field or gallery.

In illustration of my meaning, I will mention *one* of *two cases* as having occurred to me. Six weeks ago I answered an advertisement of this kind which appeared in one of the photographic publications; and after forwarding specimens and reference, both of which proved satisfactory, I was engaged, and came a distance of 300 miles. In the short space of *two weeks* I was treated to a great surprise, that of *one week's notice* to leave, the excuse being—the truth of which I do not for one moment doubt—that owing to a disappointment in some money matters my employer would not be enabled to continue my services any longer, although he admitted my capabilities as a first-class operator. I, of course, left, at the same time knowing there was a remedy against such treatment; but, upon consideration, I found no advantage would accrue were I to apply to a court of justice where the offender was not worth "powder and shot."

Unless professional photographers have the means at their disposal to battle against the many ebbs and flows to which the photographic business is prone during the year, they ought not to mislead operators by startling advertisements. I am thoroughly convinced that many of them are only put forth as a trap to catch some first-class operator, and, after well picking his brains, in a few weeks discharging him with sundry excuses tantamount to nothing.

I think it would be a boon to photographers if some respectable firm, such as Messrs. Knight and Sons, Horne and Thornethwaite, &c., were to keep a register of parties *wanted* and wanting situations—in both cases a reasonable sum to be charged per month; and in the case of operators requiring a situation, to leave at the register office a specimen or specimens of their *own* guaranteed productions. Where the specimens shown were not first-class a refusal might be made to place the party on the register.

Trusting, as a lover of justice, you will insert this,—I am, yours, &c.,
JUSTITIA.

PREPARATION OF NITRATE OF SILVER, &c.

To the Editor.

Sir,—Wishing to prepare my own nitrate of silver, I dissolved a coin in nitric acid by means of heat. I continued the application of heat until the whole of the liquid had evaporated, leaving a *green* crust, which, having broken up, I proceeded to wash, but, contrary to my expectations, the crystals after being redissolved still retained the same *green* colour. 1. Will you be kind enough to point out where the fault lies, and how I am to go to work to ensure success? 2. At the same time will you oblige me with directions for preparing chloride of gold? 3. Is there a book on the preparation of chemicals more explicit than Hardwich's?—I am, yours, &c., LUNA.

[1. The green colour is due to the presence of nitrate of copper, which may be got rid of by raising the heat very considerably, so as to fuse the product; the nitrate of copper is thus decomposed into black oxide of copper, insoluble in water, and oxides of nitrogen, which escape. If you wish to prepare nitrate of silver you will save yourself much trouble by purchasing pure silver, sold at about five shillings and sixpence or from that to six shillings per ounce.

2. To prepare chloride of gold we advise you to apply to a refiner of the noble metals, such for instance as Messrs. Johnson and Matthey, of Hatton Garden, E.C., and obtain pure gold in the form of a brown spongy mass. Dissolve thirty grains of this powder in a drachm of nitric acid, mixed with four drachms of hydrochloric acid and four drachms of water, evaporating to dryness at a gentle heat.

3. We are not aware of the existence of any *better* work. Mr. J. B. Hockin also gives some information upon the same subject.—Ed.]

HONESTY *v.* PHOTOGRAPHY.

To the Editor.

Sir,—The title of my letter may seem strange to some eyes. I wish there were no occasion for it; but cases are daily occurring which seem to call for some animadversion. The *Journal of the Photographic Society* furnishes us with one instance in its last number, where it is stated that some unprincipled photographer has desired to be furnished with Crystal Palace season tickets for members of his family, on his sending (as his own), for exhibition, works by other artists which he had purchased. Conduct such as this seems to demand our severest reprobation. Photographers have been zealous of late in denouncing what they call trickery, or contrivances by which certain effects may be produced. This is a large subject, and much has been written about it in reference to painting; but these mechanical dodges are quite put into the shade by those which offend against morality, and remind one of the trite proverb, so applicable to photographers, about inhabitants of glass houses. A case before your Liverpool magistrates a few months ago is quite in point: an assistant had made use of negatives belonging to his employer. There was also an advertisement of apology in the *Athenæum* of the 9th instant, from which it appeared a copy of a published portrait had been

taken without leave. Now, what would be said if an amateur made use of private opportunities to re-hang, for his own satisfaction, pictures sent for exhibition, particularly if those pictures are not strictly his own; and this leads me to ask if plates prepared by a friend, and perhaps developed by him, can, with propriety, be called the productions of a person whose only share in them has been the exposure. If I buy prepared plates (Dr. Hill Norris's, for instance), and treat them myself, am I not bound, in honour, to state the fact of their being so purchased? These remarks would be unjustifiable if instances did not occur; and, though it is not allowed publicly to give names, and say of such an one "thou art the man," yet they may go home, I hope, to some who ought to know better; and the sooner photographers purge themselves from such proceedings the better: their art is no exception to the rule, "Honesty is the best policy."—I am, yours, &c.

Manchester, June 25, 1860. DETECTIVE.

MRS. SPRIGGINS NATURALLY INDIGNANT.

"He as steels my pus steels cash but he as steels my name steels wot his godfathers and godmothers didnt promise for him."

To the EDITOR.

SIR,—Its meen thats wot it is, but I'in better than I wos thanks be· I never thort I should a got over the atack a spazzums I ad wen I looked in the fust of June number of the *British Journal* and sor as sumdy ad been a pursonation of my name. I went off and never new weather I wos on my ed or on my eels till I found myself in the twopairback's arms a givin me stuff out of a black botle as he keeps along with his tea and shuger with a large PIZUN writ on it for the children would touch it. Well it tasted just like gin the nasty stuff wich I never could a bare and it did me a grate deal a good. The weigh of it wos this. You must no the twopairback lends me the *British* reglar now since I'm a contribulatur and wen he giv me the fust of June "Woman" sez he "thy name is disseet" "Sir" sez I nettlin up "my name aint wot you sez but Spriggins and your know man to call a unpertected female a woman." "Mrs. Spriggins" sez he "you've diseaved me it wos only last Thirsday as you wos appraisin of Mr Robbingsons picturs down the street up to the skize and now I sees this letter" a shakin the fust June number in my phace which I sez "Explane yerself if your a gentleman" "Read that" sez he which I did and faints a way like a stone imediate. Howsever I cum two wen he giv me the pizun but it wosnt till he giv me sum more in ot water with sum shuger to act as a nantydoke he said that I cum two kwite and was able to read the trash agin. I never felt so overcum since that voil uzzy of a nus as I ad with my secund bein weekly and couldnt nus her meself wore my blue satting bonnet with the yaller fether on the pier and all the town said "Lor there goes Mrs Spriggins out and the baby only five days old tho it is summer whether which Sir is nether ear nor there no nor anyware else ether along if this orrid rane and aint likely to be leastwise this year and took her for me. Phansy the phelins of a reseptable female at bein called a suspicious carakter in print and he's no gentleman and I dont care who nose it. I scawn revenge or I'd carry it afore a British Jedge and Jewry and then see who'd look suspicious. Suspicious indeed! (Here Mrs. S. enters into particulars concerning the respectability of her family—paying her way, the various offers of marriage she has received during her widowhood, the Volunteers and the bad weather, which are very interesting, but wholly irrelevant to the matter in hand).

And then his preshus perduction is one mask of lise and bad gramer. The twopairbax name isnt Snooks I should jest like to see a lodger of mine with sich a vulgar name, the retch I'd charge him dubble rent and his brother will never put his knows under my rofe as long as there's nales on my ands after the frite he made of me wen I had my likeness took I should like to see him the meen villing. And if the patchwork kwilt was made by my Grandmother why should he turn it into reticule. As to lecturin at the Photographic Society I dont a proov of ladies lecturin anywears out of there domestic spear and the twopairback sez I'm write for he nose won Photographic Society as is kwite spiled with a parsel of old wimen a lecturin and afussin about it. My boy nose better than smokin and guzzling grog in my place. Let me kitch him at it thats all. Then wot he say about certing females as I would not defile my pen to name its simply ridiclous let alone undecent. I have red your remarx about Mr. Robbingson's pictures and beautiful they are perticly the young gal a dyin and the pore thing's mother a cryin and the dear old father a lookin out a winder so that they shant see him a cryin. I nose he's a cryin tho I can't see his phace. They have got it down the street and I alwys stops and as a good cry for you nose a mothers pheelinks which I suppose the lo fellah would call them patchwork and so they are and so's ourselves and the beautiful fields and the pretty ships and the evings. But I aint a goin to fite for Mr. Robbingson seein he's so clever and can do it hisself for it would be a liberty but I hope he will. Fairplay's a juel as the young uns say and she speaks truth there are men who alwys quisses everythink noo speshally us wimen, for how the twopairback did quis my noo kriloneem the other day. Mr. Holdsworth is very a musin. They say "There's corn in Israel" but I think there's charf two. Milly is quite well agin and Jim's a comin ome from see next weak. Hoppin you and yourn are well and feelin grateful for favours conferred.

I remain, Sir, Yrs respekfeately

PENELOPE ANN SPRIGGINS.

P.S.—In case any of your female readers is affected with spassums the twopairback ses that the pizun he giv me was sakrated sperit of jupiter to be mixt with half water jist off the bile and two or three lumps of shuger but if two much is took it as orrid effect on people makin em lose there feet and legs and corsin· em to sea dubbel and all manor. Kitch me a cleinin out his cupboard agin he shall jist do it hisself I aint a goin to loze my legs for nobody. P. A. S.

[We are not surprised at the indignation of Mrs. Spriggins; we had some doubts about the genuineness of the letter of which she complains, as the handwriting did not at all resemble her own aristocratic scrawl.—ED.]

ANSWERS TO CORRESPONDENTS.

MARIANNE.—Solomons, Red Lion Square.

ROBERT L.—Not worth publishing; they lack vigour.

R. S.—Add a little more acetic acid, say ten minims to the ounce of solution.

J. M. C.—We are obliged for your good wishes. We have seen the specimen which you name, it is *not* good, as you say.

J. W. N.—We have not yet arrived at an instantaneous dry process. The malt process, or the Fothergill, will answer your purpose.

MARK.—We are obliged for your communication, but as we have already seen it in a contemporary under another signature, we must decline it.

WM. NEWTON.—You have used too great a glare of light. Shade one side of your sitter, or you cannot get half-tone.

AN IMPATIENT OPERATOR.—We know of no such person as you are seeking. Try M'Lean, Melhuish and Co.

CALOTYPE.—We shall most likely have to announce shortly the plan that will suit your views exactly.

JEMIMA M.—Hear both sides of the argument; the truth will always prevail in the end.

FREDERICK SIMPSON.—You have put too much acetic acid in your developer: with gallic acid you need not use any for some plates.

ROBERT HULETT.—See reply to "J. H. W." Send a list of names and we will indicate by number what you want to know.

IN HASTE.—Many correspondents are like yourself—want an early reply, and send their letters *too late* to have one in the following number. You cannot do what you inquire about.

W. H. H., jun.—There is nothing so small published as you wish for; in fact you have named the whole of the periodicals. Mr. Hockin's manual would perhaps suit your purpose.

C. C. W.—OLD SUBSCRIBER.—1. It is possible that water might be rendered unfit for developing and sensitising solutions by passing through leaden pipes. 2. Add solution iodide of potassium, or of hydrosulphate of ammonia; the first would produce a yellow, the second a dark coloured precipitate. 3. By distillation.

SCRUTATOR.—We stated in our leader that there was *nothing new* in the paper to which you refer—why then are you surprised to find the statement correct? Can you point out any single instance in which we have mislead our readers with regard to facts? We did not assert that there was nothing true, though we must admit that there are some things untrue.

J. H. W.—We cannot recommend by name any special maker of lenses: it would be regarded as unfair by the dealers not named. For good second-hand ones you can safely apply to the party you have mentioned. For our opinion of Derogy's lenses you can consult a back number in which we reported upon them from a careful examination by request of the agent here. The camera must depend upon the lens and the price you are content to give for it. The cheap French walnut wood cameras answer very well for portraits.

GREEDY CHAP.—Probably the collodion has something to do with the unpleasant blueness of which you complain. Try another sample. You will find a formula for a nitrate bath in the back numbers of this Journal, or in any shilling manual of Photography. There is not much difference of opinion as to the proper mode of making a bath, and hence you may avail yourself of any published formula you may meet with. GREEDY CHAP will be obliged if Mr. M'Adam will give particulars how to prepare the electric light as used by him to exhibit transparencies in the magic lantern; how many cells of Bunsen's battery are necessary; and if any danger attends their use?

"PALMAM QUI MERUIT FERAT."—1. The lancewood spring rail for the drying-frame does *not* stain the plates—it merely touches the extreme angle. 2. You do not give any data whereby we can decide the probable cause of your not getting good portraits: in what respect are they "bad"? 3. Protosulphate of iron fourteen grains, nitrate of potash ten grains, distilled water six and a-half drachms, acetic acid (Beaufoy's) one drachm, alcohol half a drachm, will make a good, flowing, positive developer. 4. The speck in your lens is *not* of the slightest consequence. 5. For views the camera should be very nearly level: for portraits we prefer it so likewise, but many operators make it "look down" a little; but in our opinion this gives an undignified aspect to the sitter. 6. You cannot do better than adopt the toning process you name.

FIXED.—We have never tried the special kinds of collodion named by you, but have no doubt they are equal to the average of those in the market. Your mode of developing is good in experienced hands, but not so in those of a tyro; because he never stops the action of the iron developer soon enough. We recommend you to try the following:—

Pyrogallic acid	2	grains.
Distilled water	$7\frac{1}{2}$	drachms.
Glacial acetic acid	$\frac{1}{2}$	drachm.

The alcohol is superfluous and objectionable in this. Expose longer than you have hitherto done by about one half your usual time; pour on of the above sufficient to cover the plate at once, but not more; keep the liquid flowing and you will find the image appear slowly; carry on the action until the intensity appears very great, but arrest the action before the shadows are fogged. Wash well and fix with hyposulphite of soda, and again wash thoroughly.

BOTHERING AMATEUR.—Coat a very clean plate with any negative collodion suited for the dry processes, sensitise as usual, and wash the plate in a dish of distilled water, *but not too much;* then pour over the plate some linseed tea prepared in the following manner:—Linseed half an ounce, hot water one pint, mixed in a clean earthen teapot, keep hot before the fire for half an hour, strain through a piece of sponge placed in the neck of a funnel; when cool it is ready for use. After the film is evenly coated with this liquid set it up to drain, and then dry by aid of heat in a proper drying box. A number of plates may be thus rapidly prepared which retain their sensitiveness for a considerable time. The surface, after drying, is perfectly free from stickiness, and so does not retain any particles of dust that may come in contact with it. If the film should crack it is a sign that the liquid is too thick for the sample of collodion employed, and it is then only necessary to dilute the linseed tea. This preservative liquid should be prepared fresh when required. Wash the plate in a dish of distilled water before developing.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this* Journal *should be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 122, Vol. VII.—JULY 16, 1860.

In our issue of the 15th ult., we casually alluded to the paper read by Mr. Dallmeyer at the closing meeting for the season of the Photographic Society, intimating our intention of returning to the subject on a future occasion. There are several reasons why we do so now, amongst them certain enquiries which we have received, soliciting information relative to the alleged improvements introduced into the photographic objective by the author of the paper mentioned. Questions of this kind are much more easily asked than answered, especially when it must be admitted that a claim has been set up for that which we see clearly enough cannot be established. That certain claims were made in the paper itself will be seen from the following quotations, which we extract from the official report of it in the organ of the Photographic Society, viz.:—"The portrait lens, as constructed and left by my late father-in-law, though it has been used with diaphragms, was not intended for such a purpose, *and, therefore, required reconstructing*," &c. Again:—"If it should be found that the instrument which, in the hands of my late father-in-law, attained so great a measure of perfection *has been still further improved* and rendered more extensively useful," &c.

It is very true that after the reading of the paper, which gave little or no information whatever relative to the nature of the alleged improvements, we find, during the ensuing discussion, that the author expressed himself thus:—"With reference to novelty I claim *none*." But this was not until it had been pointed out to him that some of the mechanical conveniences noticed as new, by implication, had been previously in use by others for several years past, while the extracts from the paper and that from the statement during the discussion appear to us as totally irreconcilable with one another.

There is one paragraph in Mr. Dallmeyer's paper with which we cordially agree, and which we heartily wish photographers more generally understood. He says:—"Strictly speaking, depth of focus means a *general want of focus*." This is a point upon which we have insisted repeatedly, and it will be much to the advantage of our art when its votaries cease to choose lenses for the very quality which brands them with an indelible stigma of inferiority. Mr. Dallmeyer says rightly enough that the only correct remedy for the inconvenience arising from objects being situated at widely differing distances from the lens is in the use of a sufficiently small diaphragm: he, however, lays too much stress upon the aberration from diffraction, due to the supposed use of *too* small a diaphragm by operators—an error very unlikely indeed to occur, for before this limit could be reached, it would be next to impossible to see to "focus," from the necessary enormous reduction of the amount of light transmitted. It would have been advantageous if the author had stated what he regarded as a minimum diameter of aperture in terms of the ratio of the focal length of the lens employed. Upon this point we can offer some incontrovertible evidence. The late Mr. Samuel Buckle, who generally adopted the calotype process, and therefore required a longer exposure than those who employ collodion, usually made use of stops with very small aperture. Some of his productions we have in our possession, and more beautiful pictures of their kind it would be difficult to procure. For the general excellence of his works, we need only point to those which found a place in the Great Exhibition of 1851, and in some of the earlier collections exhibited by the Photographic Society. Some of the very best of these were taken by a lens of nine inches focus, of the ordinary meniscus form, made for him by Mr. Thomas Ross, and with which he employed diaphragms with apertures of one-fifth and one-eighth of an inch respectively, consequently as small as *one forty-fifth part*, a one *seventy-second part* of the focal length, and these certainly were not impaired by any aberration from diffraction. These proportions are, however, much smaller than are at all needful, except, perhaps, in some extreme cases—one-twentieth to one-thirtieth part of the focal length being those most generally useful—for it is found in practice that, by attenuating the pencil to an excessive extent, a weakness and want of vigour in the resulting image is apt to occur.

Want of experience in the art of photography probably tends to mislead Mr. Dallmeyer with regard to the stops, for it must be borne in mind that this is not exclusively an optical question; and he will find that for general landscape work, where parts of the subject necessarily lie in very widely-differing planes, sufficient definition will not be obtained with a large aperture, especially if a large angle of view be included, so that for the purpose indicated the proportions above named will generally find most favour. He appears to imagine that there is some originality in arranging his stops, so that "counting from the largest to the next size smaller, the time of exposure required to produce a picture is doubled, whereby," he says, "much time lost in computing and experimenting will be saved." With regard to this arrangement it is a very common practice; and *he* surely must know that it was adapted by Mr. Thomas Ross to his father's lenses, many years since. As to the assertion relative to loss of time in experimenting, &c., we do not perceive any greater difficulty in reckoning an increase of time by arithmetical than by geometrical progression; and it is a fact that some operators imperatively demand a more delicate gradation than is afforded by the latter.

We now come to the question of *position* of the diaphragms, and the resulting distortions or freedom therefrom—a question which we have more than once discussed in these pages; for instance, in Vol. II., New Series, pp. 163 and 164, 1st July, 1858; also in Vol. VI., p. 222, Sept. 15, 1859. The use of diaphragms between the lenses of the portrait combination ensures freedom from perceptible distortion, owing to the fact that the displacement in one direction by the front lens is counterbalanced by an equal, or nearly equal, displacement by the back lens, but in a contrary direction. The use of diaphragms in this position is as old as the first portrait combinations made by Mr. Andrew Ross; but Mr. Thomas Ross afterwards found, when copying daguerreotype pictures, that the field was flatter with

the stop placed in front of the anterior lens. From that time they have been employed by photographers in either position, according as freedom from distortion of the image or flatness of field were of the greater importance for the work in hand.

It has been very gratuitously assumed by the author of the paper from which we have already quoted that "flatness of field is one of the greatest requisites" in taking views, and that the portrait lens as left by the late Mr. Ross is not adapted for landscape work, because with the diaphragms between the lenses the field is not so flat as when they are placed in front of the combination. We have no doubt, from the above statement, that the author has not been accustomed to take landscapes at all, or he would scarcely have come to any such conclusion. Very few views have all the objects in one plane, or anything approaching thereto. It not unfrequently happens that the principal objects are located in a curve convex towards the lens, still oftener concave with regard to it; and in either case the treatment required resolves itself into a matter of focussing and stopping down the lens to meet the conditions of the case. Flatness of field, then, for an ordinary landscape combination is by no means a quality of such paramount importance as to induce the sacrifice of other important excellencies to obtain it. We value flatness of field as much as any one; but as gold may be bought too dearly, so also are we not content to obtain flatness of field at the expense of lateral definition—the sacrifice which Mr. Dallmeyer appears to have made for it, judging both from his own statements and from the specimen pictures exhibited by him. He says:—"I have approximated to a mean between astigmation and roundness of field;" and the specimens exhibited clearly demonstrated that considerable astigmation of the lateral pencils was suffered to remain uncorrected in order to obtain the flatness of field. For those unacquainted with the subject we may state that "astigmation" may be recognised by the want of definition in the lateral parts of the field. In all of the double combination lenses made by Mr. Ross that have come under our own immediate notice the lateral pencils have been beautifully corrected. Nor is that to be wondered at; for it would scarcely be credible that one who had for many years previously devoted his scientific skill and energies to the perfection of the microscope objective should have been contented with a lens in any considerable degree deficient of definition. Instead, therefore, of regarding the alteration made in Mr. Ross's lens (which, by the way, we may remark, is not the result of one form taken up and persisted in, but the gradual growth of slight variations dictated by practical experience) as any improvement, it is clear that it is nothing more than a shifting of the burden from one shoulder to the other.

That the old Ross portrait lenses have been used for views successfully will be sufficiently evident to those who remember some landscapes taken by the Rev. Dr. Holden, and shown at the exhibitions under the auspices of the Photographic Society. The pictures to which we make allusion were upon plates ten inches by eight inches, unobjectionable, and taken with a three and a quarter inches portrait combination.

The truth is, Mr. Dallmeyer has attempted to produce a lens which is intended to be a sort of optical *Admirable Crichton*—to do something of everything, but nothing perfectly. There are some things which it is quite impossible to unite in one article, so as to perform both functions properly—*e. g.*, a teetotum and a turn-up bedstead. Perhaps photographic lenses may be included in the same category: at any rate we would warn our readers that, when the front combination of a portrait lens is constructed so as to be applicable for separate use as a landscape lens, if the portrait arrangement be upon the best known construction, the front part will make but an indifferent view lens alone; or if it be good as a view lens, then the portrait combination arrangement can be but a makeshift.

There is one paragraph that is totally incomprehensible as it is given, we mean that relating to a large angle of field being equivalent to a lens of shorter focus, and therefore quicker than ordinary lenses, and in stating that because it includes an angle of 50° that it is 10° more than is taken by the forms of lenses previously alluded to (meniscus and orthoscopic). The author commits an error which would have been probably avoided had he read the previous number of the *Journal of the Photographic Society* to that in which his paper appeared; for in the record of the previous meeting of the Society it is stated "that a print of *Trinity College, Dublin*, was exhibited, including an angle of *upwards of* 60°, from a negative taken with one of Mr. Grubb's lenses." Were we not apprehensive of testing our readers' patience too severely, we could point to several more misleading assumptions. As an optician the author may know very well what he is about—as an acute business man he certainly does; for has he not managed to obtain from our worthy brother editor a gratuitous advertisement in the pages of the Society's organ under the guise of a "paper?"—but as a photographer he has much yet to learn.

The paper upon which we have been descanting reminds us of the celebrated criticism published in the pages of a literary journal noted for its sarcasm, which ran somewhat after the following manner:—"Mr. * * * complains that we have not noticed his book: he had better have been contented with our silence. We have perused the book, and find that everything which it contains that is true *is not new*, and everything in it that is new *is not true*."

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 8.

Each new suggestion for the better intensifying of negatives receives our careful attention, because we are convinced that a process of this kind is at present a desideratum. Some long time ago the iodide of arsenic was spoken of, in connexion with the proto-iodide of iron, as an accelerator; but we did not then give it a trial, since it appeared doubtful whether any similarity existed between the two substances thus associated. Iodide of iron is an absorber of oxygen, and produces a developing agent, viz., protonitrate of iron in the bath. Iodide of arsenic, on the other hand, liberates nitric acid in the bath, and ought to retard reduction. Theoretical considerations, however, must sometimes be neglected in photography, and hence, on finding the subject again brought forward, and this time in a new light, we determined to investigate it.

A convenient method of obtaining the iodide and bromide of arsenic is by shaking up a recently-prepared alcoholic solution of iodine and bromine respectively, with an excess of finely-powdered metallic arsenic, until the solutions cease to colour a mixture of starch and iodide of potassium. A few minutes' agitation suffice to produce the result; and the liquids may then be allowed to subside, and the upper part decanted for use. Prepared in this way they are free from arsenious acid, and do not produce any milkiness in collodion made with anhydrous spirits. The addition of water, however, produces immediate decomposition, and arsenious acid is thrown down. Diluted alcohol has the same effect.

The collodion employed in the experiments was iodised with cadmium, the pyroxyline having been made purposely in weak acids, so as to give a maximum of sensitiveness but a small intensity. This preparation was found on trial to be so rapid in its action that, with a whole-plate portrait lens, a negative could be obtained in the open air in about two seconds, or in the glass house in six seconds, the developer being pyrogallic acid solution of the usual strength. The test object for the experiments consisted of a white bust, with a dark stuffed bird well shaded by drawing the curtains around it; and to reduce the light still further, the smallest diaphragm but one of the Waterhouse set was introduced. The following were the results:—

With the simple collodion, and a rather old bath in good condition for yielding intense negatives, the exposure was thirty seconds. The negative appeared full of fine details; even the darkest feathers of the bird being clearly distinguishable from the back ground. The intensity, however, was decidedly insufficient, and not only so, but there was an evident aspect of *halation* or draining downwards from the head of the statue, also a want of sharpness over the whole picture, with a few white spots and a transparent curtain mark at the bottom of the plate.

Taking a portion of the same collodion, the iodide of arsenic was dropped in cautiously until the colour became lemon-yellow, and thirty seconds were given as before: this picture, however, was a failure from under-exposure. To a second portion of the same collodion the bromide of arsenic was then added rather more freely; in half-an-hour the tint became that of brown sherry. The light remaining nearly the same, thirty seconds were again given, and the pyrogallic acid developer applied as before. This time the success was better, for the bust developed of an inky blackness, and many of the details came gradually out. On fixing the negative, and bringing it to the light, the appearances were these:—The amount of detail was evidently less than in the first negative, inasmuch as the darkest feathers on the neck of the bird could not be distinguished from the sombre tint of the back-ground. The statue, however, appeared to be as much exposed as with the simple collodion. As regards intensity, the difference was more decided by reflected light than by transmitted light, and appeared to consist rather in colour than in actual thickness of deposit—the arsenic negative being smoky or brownish-black, the simple negative of a violet blue. One point, however, in the arsenical negative appeared satisfactory—it had in great measure those peculiarities which are found in a bromised collodion, viz., sharpness and decision of outline, absence of halation, absence of white spots, curtain marks, &c.; so that, on the whole, the arsenical negative was deemed the better negative of the two.

Being satisfied thus far, we continued the experiments by opening up the aperture of the lens and working with a full supply of light, five seconds' exposure being allowed. The results confirmed the preceding—the simple collodion being superior as regards rendering the very darkest parts of the object, but the collodion containing the bromide of arsenic giving the most smoky negative and the best definition. Upon the whole, the advantage of using the arsenical preparation was less evident in these experiments than in the last, since the simple collodion gave enough intensity without any addition when the development was sufficiently pushed.

Leaving the collodions we then proceeded with the bath. The solution of iodide of arsenic, mixed with a little nitrate of silver, threw down iodide of silver, and developed a strong acid reaction. This had been anticipated, because there exists no oxide of the metal arsenic capable of neutralising nitric acid and producing a soluble nitrate; hence the effect is much the same as when *iodine* is added to nitrate of silver, only that in the former case you have arsenious acid, in the latter an *iodate* in addition to the nitric acid. Taking the whole of the bath solution in which the previous experiments had been made, iodide of arsenic was dropped into it until it became quite opalescent from suspended iodide of silver, and a piece of immersed litmus paper slowly reddened. After filtration pictures were taken on a simply iodised collodion, and with tolerable success. The exposure required was longer than in the case of a pure bath, but by allowing more time a picture could be obtained. The negatives taken in this bath had not the characteristic smoky tone of those before referred to, but resembled simple collodion negatives. Finding that the bath had not been hopelessly ruined, we next shook it up with arsenious acid (as much of the powder as would stand upon a sixpence), and repeated the experiment. The result was, that a picture came out, but it lacked detail, and was foggy in the shadows. Lastly, we dipped the arsenical bromised collodion into the same bath. This negative turned out well, and was free from fog.

Many other experiments have been made besides those mentioned above; and our present impressions are as follow:—Iodide of arsenic added to a simply iodised cadmium collodion of the most sensitive kind, the developer being diluted pyrogallic acid, diminishes the sensitiveness, and that to an extent sufficient to prove an objection to its use. Bromide of arsenic in cadmium collodion undergoes a double decomposition, bromide of cadmium and iodide of arsenic being formed: this preparation possesses many of the advantages of a bromised collodion, and gives a more smoky colour of the image in the high lights. The nitrate bath is not very quickly affected, and will remain in order for a long time if a bromised collodion be used. Both the iodide and bromide of arsenic exert a slight gelatinising action upon the collodion. The effect of these arsenical preparations is not unlike that of the protochloride of palladium, used as an intensifier, and is less decided than the effect of glycyrrhizine, or of pyroxyline made purposely for giving intense negative images. In all probability the smoky colour of the arsenical image is due to the silver being partially alloyed with arsenic, and the principal reason why it appears to develop with so much force in the first instance, is because the image, being superficially darkened, contrasts well with the surrounding yellow iodide.

ON THE PREPARATION OF POSITIVE PAPER.

By M. Aleo.

I. PREPARATION OF THE ALBUMEN.

Break the eggs into a graduated measure, taking care not to contaminate the albumen with the yolk, and, when the requisite quantity is obtained, separate the germs and pour the whites into a glazed porcelain basin; and to every one hundred parts add five parts of a soluble chloride (hydrochlorate of ammonia, chloride of sodium, or chloride of barium*), previously dissolved in the least possible quantity of water. The quantity of water must not exceed one-tenth of the albumen, if it is wished to obtain proofs of great brilliancy. Beat into a thick white froth, and after five minutes' rest, remove the froth with a fork, and throw it on a hair sieve, which should be placed in a second basin. Gradually beat all that remains in the first basin, until all has been coverted into thick froth and strained through the sieve. Leave the froth to settle for twelve hours, and the liquid that flows through is ready for use. When the paper is prepared, place a basin with a glazed bottom so that it is quite horizontal. Into this filter the albumen by means of a small fine sponge put into the neck of a glass funnel. Albumen that has rested for a few days is much better for use than that newly prepared. M. Aleo advises that the bath should be filtered into a basin about twelve hours before it is used, and to keep it carefully covered. In fact, the albumen settles and purifies itself like collodion. If we attentively examine a basin containing a bath recently filtered, we find on its surface a quantity of small floating particles resembling little drops of coagulated albumen: to these are attached long threads of albumen, and a sheet of paper placed on such a bath takes up this bleb and thread when removed. If, on the contrary, the bath has had time to rest, all the impurities settle down and become harmless.

II. PREPARATION OF THE PAPER.

The positive paper must be carefully selected and tried previously to preparing any quantity. The paper must have been sized with the greatest care, or else it will look spotty, be devoid of brilliancy, and give imperfect results. In order to cut it to its proper size, put it down flat, and make use of a ruler and a very sharp point. By using a paper or other knife, or by folding the leaf, inequalities will arise, and the albumen, being retained in these places, will flow unequally, and thus produce all over the sheet marblings and other stains. Having marked the back of the paper, place all the leaves one upon the other, and then proceed to place them on the albumen bath. For this operation we must choose cool, and especially damp, weather. When this is the case the paper is yielding, a little moist, and consequently sticks to the albumen bath by cohesion, and without any bubbles; when, on the contrary, it is dry, its surface is hard, which prevents the albumen from flowing easily, and hence a great many bubbles; the paper also dries more slowly, and, consequently, we may be prepared to see the upper part of the leaf quite dry, while the lower part is still impregnated with albumen, which would cause ring-like marks. The first leaf is almost always imperfect, and, in fact, should only be used to cleanse the surface of the bath.

To lay the sheet on the bath, begin by making two small folds, turned up at the angles; take it by the upper angle, hold the lower angle, and place the lower part of the sheet on the bath, on the side of the tray which is nearest to the operator, and continue to lower the sheet in a bent position, and following the movement of the wave of albumen, which must flow slowly to the other end of the paper; whilst doing this, care must be taken to go on regularly, and particularly to avoid lifting up a part already wetted, for at each stoppage we should find a film of albumen which, being partly on the leaf and partly in the bath, might spoil the sheet in preparation, and also the one following.

There will be a time when some difficulty will present itself, namely, when the leaf can no longer be bent; it then falls flat on the bath, and touches in several places on a broken-up surface, which will be the cause of bubbles. This inconvenience we can easily avoid by slowly dropping the leaf on the bath, and pressing slightly with the fingers on the back of the paper.

The time for laying on the bath, which may vary according to the thickness and sizing of the paper, is on an average two minutes and a-half. It is always necessary to wait till the sheet has quite flattened out, as it often curls up the contrary way, especially if

* Frequently the chloride of barium, crystallised in an acid liquid, partially coagulates the albumen; and, after its preparation, produces a turbid liquid, which will nevertheless give good results.

thick and strongly-sized paper is employed. After the time mentioned, take the leaf by the two corners which have been made before laying it on the bath, and thus lift it up with a slow and regular movement, and in this way the albumen flows in a continuous even coating from the upper to the lower angle, and it is then suspended with all the precautions given in section 3. It will be seen that by this way of operating the sheet is laid on the bath, lifted up, then suspended in its greatest breadth in such a manner that there is the least possible distance between the upper and lower part of the sheet, and consequently less chance of its drying in zones.

III. SUSPENSION AND DRYING OF THE PAPER.

The mode of suspending and drying the paper is one of the most important points, in order to avoid unevenness, and the following means have been used with invariable success, and without the least difficulty:—Take two strong cords, commonly called whip-cord: begin by waxing them well, in order to avoid in the movement of the sheets the detachment of dust, which would cause spots; on to each of these cords string an equal number of little squares of thin cork, about one and a-half inch square, having in the upper part, and nearly at the same point, a hole large enough for allowing the corks to run freely on the cord. The latter are placed parallel, and by means of three small wooden bars, fixed, one in the middle, and the others at the two ends of the apparatus, they are kept asunder; care must be taken that the distance is about two-thirds of an inch greater than the large side of the sheet of paper. This apparatus is now fastened to the opposite walls of the room in which the operation is performed; the cords are stretched tightly, quite horizontally, and a little higher than the height of the head. Through all the corks on the same side, on the right for instance, a varnished steel pin* is run obliquely, the point of which must stick upwards towards the operator, and incline towards the exterior side of the cord on each cork; on the left another pin is stuck, which will thus be found at hand at the moment it is wanted.

These arrangements being completed, carry the sheet, which must always be kept in the same position, to the suspending apparatus; present the right angle of the leaf to the steel pin, lightly pulling it with the left hand, and without any pressure the very sharp point will immediately penetrate it; the oblique position which has been given to the pin will be sufficient to hold this corner of the leaf. Then stretch out the paper towards the cork on the left, and fix it there with the second pin, taking care, however, to place it so that the upper part of the sheet is completely stretched out; in fact, if care be not taken to stretch the leaf completely, it will soon form a curvature, which will again be the cause of unevenness of surface. In this manner the albumen flows down quite regularly in a sheet, and accumulates at the bottom of the sheet, whence it is made to fall by the passing over it, from time to time, of a stiff stick, which scrapes the lower edge. This albumen is received into a basin, and may be used again after having been filtered. We must not allow the albumen to flow off at a single angle, by inclining the apparatus even very slightly towards one side, for this inclination may produce a horn-shaped scroll at the highest corner, and be again the cause of unevenness and spots.

There should be three or four suspending arrangements put up parallel by the side of each other, and to these the sheets of paper should be suspended in succession one after the other; thus the dripping of the albumen can be more readily observed, for it would be found very troublesome if the leaves were suspended immediately one over the other. When the leaves are getting dry, put them closer together; lastly, put them into the positive pressure frame, in order to smooth them again.

The suspending apparatus, as explained above, besides perfectly answering its purpose, has this great advantage, that it is not at all bulky, but it may be put up and taken down again with the greatest ease, and it allows a great number of sheets to be hung up at the same time; in fact, the length of 39 inches is sufficient for extending ten sheets at a time.

The formulæ are those which are generally to be found in treatises on photography, but up to the present time no one has given the whole of the precautions which must be taken, and these have only been discovered through a series of failures, which had to be rectified as they occurred, and it is therefore thought that these notes may be useful, if the minute descriptions given of each operation do not weary the amateur.

* Varnished steel pins are preferable to varnished brass pins, because the former do not get so easily blunted.

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.*

Report of the Committee, consisting of Messrs. Maskelyne, Hadow, Hardwich, *and* Llewelyn.

The chemical problem presented by the photographic image is one of great complexity. It is uninviting to the chemist in so far as it presents very little opportunity of his obtaining quantitative results; for howsoever subtle and rapid be the chemical transformation effected by the light, it consists, in most cases, of a superficial change only, and defies even the delicate methods of the balance. In undertaking to collect what is known and to test the correctness of what has been published regarding this intricate problem, the Committee have proposed to themselves to deal first with the simplest transformations on which photographic processes are founded, and to pass on from these to the more complex.

Moreover they confine themselves to the photographic results obtained with the salts of silver, as these are the most employed, and because it is necessary to assign some limits to their inquiry.

If the salts of silver are the most remarkable for their susceptibility to photochemical change, one is naturally led to search first for the causes of this among those simpler compounds of the metal in which the transformation is not complicated by the secondary decompositions which might be expected to accompany it in the case of organic compounds. Yet among the inorganic compounds this susceptibility to photochemical decomposition is rare; and though not absolutely confined to one salt, the chloride of silver, that body exhibits the simplest and one of the best illustrations of it.

The chloride of silver, when perfectly pure, passes, on exposure to light, from its pure white through various stages of change in hue, in which blue is mixed with grey, until it finally reaches a deep slate-violet colour. Chlorine is evolved from the chloride; but the question which here meets us *in limine* is one which probably underlies the whole of the problem we have to consider, and consists in the chemical condition in which the silver remains after the light has completed the decomposition so far as it can go. Is the result a subchloride of silver? or are the chlorine and the silver completely dissevered, the gaseous element going away, and the metal remaining mixed with, or rather encrusting, particles of unaltered chloride?

Certainly the weight of authority is in favour of the latter view. Such, at least, is to be gathered from papers by Dr. Draper, of New York,† by Mr. Guthrie,‡ and more recently from a series of papers by MM. Davanne and Girard, in France.

In the first two memoirs referred to, an allotropic state of metallic silver is viewed as the only explanation of the reactions of the dark substance formed by the light. No chemist, however, has yet produced this substance in such a state of purity as to be able to subject it to analysis; and the only arguments, therefore, which can be relied on in explanation of the change are such as make the fewest assumptions and put the least strain on the present experience of the chemist.

There have been many methods proposed for the production of a sub-chloride of silver by processes directly chemical. One of these consists in the suspension of silver leaf in a dilute solution of sesquichloride of iron, or of chloride of copper. But this experiment has been repeated by us, and we are compelled to look upon the purple-tinted product as chloride of silver accompanied by but a trace of a substance possessing a profoundly colouring power, which, as will presently be explained, we believe to be a sub-chloride.

In order to produce this substance with at all events a greater approach to isolation, we endeavoured to avail ourselves of the possibility of a reaction between chlorhydric acid and the suboxide of silver, and with this view instituted many experiments for the production of this last body in a state of chemical purity. Memoirs devoted to the chemistry of the suboxide of silver are not rare. Professor Faraday§ showed that the deposit formed by the exposure to the air of an ammoniacal solution of oxide of silver, consists of a compound with a composition of 108 silver and 5·4 oxygen. This composition is incompatible with a formula Ag_2O (supposing oxide of silver to be AgO); but the physical characters of the body are interesting. It is grey, and by reflected light is seen to possess a strong lustre. By transmitted light a thin layer of it appears bright yellow.

* A paper read before the British Association, 1859, and extracted from the official report, just published.

† Phil. Mag. xiv. 322.

‡ Chem. Soc. Quart. Journ. x. 74.

§ Quart. Journ. Sc. iv. 268.

Rose* has called attention to various other reactions in which suboxide of silver appears to be formed. Thus, if ammoniacal solution of nitrate of silver be added to protosulphate of iron, a deep and intensely colorific black precipitate is formed, consisting of a compound expressed by the formula $Ag_2O, 2FeO, Fe_2O_3$. Similar or analogous products of different composition are formed by the use of salts of the manganous oxide, and by solutions of cobalt; but in all these cases the suboxide of silver is associated in combination with other bodies, and does not present itself in a state from which it would be easily convertible into subchloride. Rose, indeed, has made one remark, in connexion with these researches, which has a significance of some value for the photographic chemist. He shows that, in the case of adding the acetate of silver to a protoacetate of iron, the precipitate presents the black tint and deeply colorific power which seem to characterise the compounds of the suboxide of silver. When the salts used, however, contain "strong" mineral acids, as when nitrate of silver and sulphate of iron are the mutual precipitants, the deposit is grey and metallic—the reduction of the silver is, in short, complete. The significance of this fact we shall hereafter recall.

(To be continued.)

TREATMENT OF OVER-PRINTED POSITIVES.

By M. Vernier, Jun.

Over-printed positives which are usually regarded as spoilt, and positives obtained from over-developed negatives, may be made available by treatment in the following bath, which reduces the depth of colour, and produces a general harmony :—

Cyanide of potassium	15 grains.
Water, ...	1 pint.
Liquor ammonia	1½ drachms.

After the over-printed positives have been toned, fixed in hypo., and well washed, they are put into this bath one at a time, and allowed to remain for four or five minutes, according to their intensity, and until the details in the shadows come out

During the operation the bath should be covered in by a close-fitting sheet of glass to prevent the escape and inhalation of the fumes of prussic acid given off. The solution must not be used a second time.

British Association.

OXFORD MEETING, 1860.

[FROM OUR SPECIAL REPORTER.]

The British Association for the Advancement of Science held its thirtieth annual meeting this year at Oxford, being the third time that the Association has met at the *alma mater* of many of its eminent founders.—The first of the recent series of meetings took place on Wednesday, the 27th ultimo, in the Sheldonian Theatre, which was crowded by richly-dressed ladies, and by English and foreign members and associates. At this meeting, H.R.H. the Prince Consort, in a few graceful sentences, resigned the Presidency in favour of the new president, Lord Wrottesley, who then delivered the annual address—a profound discourse, in which the progress of science during the previous year was elaborately reviewed. The closing meeting was held in the same Theatre on Wednesday, the 4th instant, when the adjournment took place.—The next annual meeting of the Association will take place at Manchester, in August, 1861.

Distinguished as Oxford is by its noble old colleges and halls, observatory, museums, libraries—to say nothing of its varied literary and scientific associations, ancient and modern, and its natural beauties—the late visit of the Association to this delightful city was looked forward to with unusual interest by the eminent in science, art, and literature, and by those migratory members who follow the Association in its periodic wanderings throughout Great Britain and Ireland.

While the late meeting had many points of interest for the visitors to Oxford; while the learned dignitaries and professors of the university dispensed their hospitalities to as many as the colleges could accommodate; although the magnificent new Museum in its architectural beauties vied in splendour with the brilliant company which, night after night, graced the *conversazioni* held within its ample precincts; and while the more distinguished *savans* were entertained at refined and charming receptions,—it must be confessed that, to the general body of members and associates, the meeting at Oxford was "slower" than they have been of late years accustomed to. That there were numerous papers of importance read at the recent meeting none can deny, and the interest of Section E (Geography and Ethnology) especially was well sustained by the presence of a large number of world-famed Arctic voyagers; still, the list of papers which appeared day by day in the *Journal of Sectional Proceedings*, failed to impress the more thoughtful of the members with the idea that the majority of the subjects brought forward were really calculated to further "the advancement of science"—at least in as great a degree as those of former meetings of the Association held at the marts of commerce and the homes of our great manufactures.

In one or two of the Sections the personal element formed an item to give animation and piquancy to the discussions; and few who were present will soon forget the "passage of arms" which took place at the Saturday's meeting of Section D (Zoology and Botany, with Physiology), between the Bishop of Oxford and Professor Huxley, on the development theory of Darwin,—which discussion followed the reading of a paper by Dr. Draper *On the Intellectual Development of Europe, considered with reference to the Views of Mr. Darwin and others, that the progression of Organisms is determined by law.* In Section E many discussions took place which brought into activity the intellectual pleasantries of Mr. Crawford, and gave warmth of expression to the remarks of other speakers in that Section.

Our own cause of complaint—or rather of regret—in connexion with this meeting, is that our *progressive* art was scarcely recognised, and that the existence of photography, as a branch of science, was almost wholly ignored at Oxford. In Sections A (Mathematical and Physical Science) and B (Chemical Science), where the followers of our interesting art "most do congregate," only three papers, and those not calculated to "advance" in any appreciable degree the "progress" of *our* "science," rewarded the photographic attendants of the Sections named,—and those papers were read in Section A. Chemical science failed to produce even one paper having relation to photography proper at the meeting at Oxford! The papers alluded to as having a bearing on our specia art were two read by M. Claudet, and one by Dr. Draper, of New York. The subjects of M. Claudet's papers were *On the Principles of the Solar Camera*, and *On the Means of Increasing the Angle of Binocular Instruments, in Order to Obtain a Stereoscopic Effect in Proportion to their Magnifying Power;* and Dr. Draper's was *On a Reflecting Telescope for Celestial Photography, now erecting at Hastings, near New York*, communicated by Professor Draper. We append these papers to this article.

To whom to attach blame for this paucity of photographic papers we cannot at present say. Whether the Association authorities repelled the advances of our amateurs and professionals, or whether the latter displayed a reprehensible apathy in the matter, we are not in a position to determine; but the cause may perhaps be traced to the fact that hitherto Oxford has "made no sign" in the art of photography, except in furnishing to Fenton, Delamotte, and others, subjects of great interest and beauty for the exercise of their artistic ability.

It is true that the noble president, Lord Wrottesley, in the admirable address with which he inaugurated the meeting, has not entirely overlooked our favourite science; for we find the following interesting item of intelligence in his lordship's address :—

> You are aware that at the suggestion of Sir John Herschel an instrument was constructed for the Kew Observatory, to which the name of Photoheliograph has been given, because it is adapted solely to the purpose of obtaining photographic representations of the appearances on the sun's disc. Many difficulties have been encountered in the use of this instrument, but by the zealous exertions of the late Mr. Welsh, Mr. Beckley, and Mr. De la Rue, they have been overcome. It is to the last-named gentleman, so distinguished for his successful prosecution of celestial photography, that the Royal Society have entrusted a grant of money to enable him to transport the Photoheliograph to Spain, to observe the total eclipse of the sun, which is now approaching, and great interest will attach to records of the phenomena of the eclipse thus obtained.

The *conversazioni* at the new Museum (of which there were four) were well attended, and passed off very satisfactorily. At the last *conversazione*, held on Tuesday, the 3rd instant, there was a magnificent display of microscopes and microscopic objects in the centre aisle of the court and in the north library. Among the names of gentlemen who contributed instruments we noticed those of Dr. Bowerbank, F.R.S., Dr. Beale, F.R.S., Messrs. Smith, Beck,

* Journ. Pract. Chem. lxxi. 215, 407 *et seq.*; see also Wöhler, Pogg. Ann. xli. 344.

and Beck; Mr. T. Ross, Mr. Dallmeyer, Mr. Ladd, Mr. Salmon, Mr. Adie, all of London; M. Nachet, Paris, &c., &c.

Regretting that we have so little photographic intelligence to communicate from the recent meeting at Oxford, and looking forward with hope to the period of the next meeting of the British Association at Manchester*—the literary and scientific activities of which city have kept pace with its material prosperity—we proceed to give the few papers connected with photography read at the recent meeting, and thus for another year take leave of the British Association for the Advancement of Science.

We must not omit to mention that Mr. Fairbairn has been chosen to succeed Lord Wrottesley as president for next year. The choice has given universal satisfaction.

* Since writing the above, we find by the report of a recent meeting of the Manchester Photographic Society, in another column, that our indefatigable brethren of the "black art" in the "cotton city" have resolved on having a photographic exhibition during the meeting of the British Association in 1861, for which active preparations have been already commenced.

On the Principles of the Solar Camera.

By A. Claudet, F.R.S.

The solar camera, invented by Mr. Woodward, is one of the most important improvements introduced into the art of photography. By its means small negatives may produce pictures magnified to any extent: a portrait taken on a collodion plate, not larger than a visiting-card, can be increased, in the greatest perfection, to the natural size; views as small as those for the stereoscope can also be considerably enlarged. This is a great advantage, which is easily understood when we consider how much quicker, and in better proportion of perspective, small pictures are taken by the camera obscura, while the difficulties of manipulation are greatly diminished.

There is nothing new in the enlargement of photographic pictures. This has been done long since, simply by attention to the law of conjugate foci; and every photographer has always been enabled, with the common camera, to increase or reduce the size of any image. For the enlargement, it was only necessary to place the original very near the camera, and to increase in proportion the focal distance. But the more the focal distance was increased, the more the intensity of light was reduced; and a still greater loss of light arose from the necessity of diminishing the aperture of the lens, in order to avoid the spherical aberration. Such conditions rendered the operation so long that it became almost an impossibility to produce any satisfactory results when the picture was to be considerably enlarged. For these reasons, it naturally occurred, that if the negative, having its shadows perfectly transparent and its lights quite black, was turned against the strong light of the sun, its positive image at the focus of the camera would be so intense that the time of exposure would be considerably reduced. So that, in order to employ the light of the sun, and follow easily its position without having to move constantly the whole camera, it was thought advisable to employ a movable reflecting mirror, sending the parallel rays of the sun on a vertical plano-convex lens condensing those rays on the negative, placed before the object glass, and behind the condenser, somewhere in its luminous cone.

Many contrivances for this object were resorted to, but without considering anything else than throwing the strongest light possible on the negative to be copied. The constructors of these solar cameras never thought it very important to consider whether the focus of the condensing lens was better to fall before or behind the front of the object-glass, provided the negative was placed in the luminous cone of the condenser. This want of attention has been the cause which has made the solar camera a very imperfect instrument for copying negatives.

The beautiful principle of Woodward's solar camera consists in his having placed the focus of the condenser exactly on the front lens of the camera obscura. As this principle had not yet been explained when the invention was exhibited before the Photographic Societies of London and Paris, and not even by the inventor himself in the specification of his patent, I find some pleasure, in the interest of photography, to bring the subject before the British Association, and to demonstrate that the solar camera of Woodward has solved the most difficult problem of the optics of photography, and is capable of producing wonderful results. This problem consists in forming the image of the negative to be copied only by the centre of the object-glass reduced to the smallest aperture possible, without losing the least proportion of the light illuminating the negative.

The solar camera does not require any diaphragm to reduce the aperture of the lens, because every one of the points of the negative are visible only when they are defined on the image of the sun, and they are so (in that position exclusively), for the centre of the lens is the only point which sees the sun, while the various points of the negative which form the marginal zone of the lens, are defined against the comparatively obscure parts of the sky surrounding the sun—are, as it were, invisible to that zone; so that the image is produced only by the central rays, and not in the least degree by any other points of the lens, which are subject to spherical aberration. It is, in fact, a lens reduced to an aperture as small as is the image of the sun upon its surface, without the necessity of any diaphragm, and admitting the whole light of the sun after it has been condensed upon the various separate points of the negative. It is evident that from the centre of the lens the whole negative has for background the sun itself, and from the other points of the lens it has for background only the sky surrounding the sun, which fortunately has no effect in the formation of the image.

Such is the essential principle of Woodward's solar camera, which did not exist in that instrument when the focus of the condenser was not on the object-glass. This principle is truly marvellous; but it must be observed that the solar camera, precisely on account of the excellence of this principle, requires the greatest precision in its construction. For its delicate performances, it must be as perfect as an astronomical instrument, which, in fact, it is. The reflecting mirror should be plane, and with parallel surfaces, in order to reflect on the condenser an image of the sun without deformation; and in order to keep the image always on the very centre of the object-glass, the only condition for the exclusion of the oblique rays, the mirror should be capable by its connexion with a heliostat of following the movements of the sun. The condenser itself should be achromatic, in order to refract the image of the sun without dispersion, and to define more correctly the lines of the negative; and a no less important condition for losing nothing of the photogenic rays would be, to have it formed with a glass perfectly homogeneous and colourless.

With such improvements, the solar camera will become capable of producing results of the greatest beauty; and, without any question, its introduction into the photographer's studio will mark a period of considerable improvement in the art.

On the Means of Increasing the Angle of Binocular Instruments, in order to obtain a Stereoscopic Effect in proportion to their Magnifying Power.

By A. Claudet, F.R.S.

In a paper on the stereoscope, which M. Claudet read before the Society of Arts in the year 1852, alluding to the reduction of the stereoscopic effect produced by opera glasses on account of their magnifying power, he stated that, in order to redress that defect, it would be necessary to increase the angle of the two perspectives. This he proposed to do by adapting to the object-glasses two sets of reflecting prisms, which by the greater separation given to the two lines of perspectives, would reflect on the optic axes images taken at a greater angle than the angle of natural vision.

Such was the instrument that M. Claudet submitted to the British Association, to prove, as he has always endeavoured to demonstrate in various memoirs, that the binocular angle of stereoscopic pictures must be, in proportion to the ultimate size of the pictures on the retina, larger than the natural angle when the images are magnified, and smaller when they are diminished; which, in fact, is nothing more than to give or restore to these images the natural angle at which the objects are seen when we approach them or recede from them. For magnifying or diminishing the size of objects is the same thing as approaching them or receding from them, and in these cases the angles of perspectives cannot be the same.

M. Claudet showed that, looking at the various rows of persons composing the audience, with the large ends of the opera-glass, all the various rows appeared too close to one another — that there was not between them the distance which separates them when we look with the eyes alone; and he showed also that, with the small end, the distance appeared considerably exaggerated. But, applying the sets of prisms to the opera-glass in order to increase the angle of the two perspectives, then looking at the audience as before, it appeared that the various rows of persons had between them the natural distance expected for the size of the image or for the reduction of the distance of the objects.

By applying the two sets of prisms before the eyes without the opera-glass, it was observed, as was to be expected, that the stereoscopic effect was considerably exaggerated, because the binocular angle was increased without magnifying the objects; but, looking with the two sets of prisms alone at distant objects, the exaggeration of perspective did not produce an unpleasant effect: it appeared as if we were looking at a small model of the objects brought near the observer. By the same reason, stereoscopic pictures of distant objects (avoiding to include in them near objects) can advantageously be taken at a larger angle than the natural angle, in order to give them the relief of which they are deprived as much when we look at them with the eyes as when we look only with one eye; instead of being a defect, it seems that it is an improvement. In fact, the stereoscope gives us two eyes to see pictures of distant objects.

On a Reflecting Telescope for Celestial Photography, erecting at Hastings, near New York.

By Henry Draper, M.D.

In the summer of 1857, after the Dublin meeting of the British Association, a party visited Lord Rosse's telescope, at Parsonstown. We were shown the machinery employed in its construction, and, as far as the weather permitted, its performance.

That visit first led me to attempt constructing an instrument which should be specially adapted for celestial photography, for which purpose the reflector possesses such conspicuous advantages over any refractor.

Those who are familiar with photographic operations know well how important it is for the ensuring of uniform success that the sensitive surfaces should always be placed in similar circumstances as to position, and that position must afford every facility for carrying on the necessary manipulations.

It appeared to me that a modification of a form of mounting proposed some time ago by Mr. Nasmyth could be made to answer these requirements perfectly, and that a Newtonian reflector, sustained on hollow trunnions, through one of which the rays from the small mirror could come, would permit of operations being carried on upon a horizonal table at the end of the trunnion with great ease. Whatever might be the altitude or position of the object the photographic table would always be horizontal.

As I proposed that the telescope should not be less than twelve feet in focal length, an advantage would obviously arise from making the vertical axis of the framework beneath its centre of gravity. The observatory in which it should be placed would then require to be only one-half the diameter that would otherwise be demanded. A twelve-foot tube could be worked with its frame in a cylindrical space, thirteen feet in diameter and thirteen feet in height.

I therefore cast a speculum of fifteen inches in diameter and two inches in thickness. The materials employed were Minnesota copper—regarded in America as the purest commercial form of that metal—and Banca tin. Their proportions were those recommended by Lord Rosse. The cast was made in sand, four inches in thickness in every direction from the speculum, which was permitted to remain for two days unopened, to insure slow cooling. It proved to be perfectly successful. The machine used for grinding and polishing it was that of Lord Rosse.

The tube of the telescope is of black walnut, bound externally by brass rings, and strengthened interiorly by iron ones. The trunnions at the little mirror are of gun-metal: they work on friction rollers of the same substance, supported on polished steel axles.

The telescope is moved in altitude, with the utmost facility, by the aid of counterpoising levers, which act perfectly, whatever the position of the tube may be. The pulleys through which these counterpoising levers work are also of gun-metal, supported on friction rollers, with polished steel axles. The motion, upon a vertical axis, is accomplished by a cast-iron shaft, two and a half feet in length, and three inches in thickness, working at one end on a hemispherical termination in gun-metal, and the other sustained in a strong and ground cast-iron collar.

The observatory in which this instrument is being placed is situated on a hill, four hundred feet above the level of the sea, at Hastings, about twenty miles north of New York.

The edifice consists of a sunken chamber, excavated out of the solid rock. The walls of this chamber are substantially built of stone, laid in hydraulic cement. They are nine feet high. On the top of these walls a lighter wooden edifice is raised sufficient to make the building of the required height. The revolving roof is metallic. The ground plan is square, and seventeen feet in the clear interiorly. As the frame of the telescope only requires a cylindrical space of thirteen feet, the corners of the building are very available for the necessary photographic preparations.

On the top of the stone wall is placed a circular gallery running entirely around the interior of the room, and enabling the operator to have access with great facility to the photographic table and the eye-piece trunnion of the instrument. The interior of the observatory is sheathed throughout with wood.

This partly underground construction has been adopted for the purpose of ensuring a more complete invariability of the temperature of the mirror. A thorough ventilation is, however, secured whenever desirable, the local position of the edifice being such that the door of entrance is on the side of the hill at the level of the floor. The wooden sheathing is for the purpose of avoiding deposition of moisture.

At the moment of writing this paper the building is unfinished, though rapidly approaching completion. The various parts of the instrument and the photographic arrangements are provided, and no difficulty is anticipated.

This is the first observatory that has been erected in America expressly for celestial photography, and it is hoped that, considering the purity of the skies, it will yield good results.

I expect also to derive considerable advantage from the method of darkening collodion negatives by the aid of protochloride of palladium, described by me in a paper read before the American Photographical Society, and which I think in this application will permit of good proofs being taken by unprecedentedly short exposures.

STEREOGRAPHS.

St. Mary Magdalen's Church, Tetbury.

This is an interior taken by Messrs. Dutton, which, though deficient of any but a local interest, is well executed both as regards the printing and the production of the negative. There is a slight curvature in the columns, but this disappears in the stereoscope: the detail and half-tone are both highly commendable, and the proof is of an agreeable tone. The subject, such as it is, has been made the most of.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.*

The following officers have been elected or re-elected for the ensuing year:—

President — Rev. Francis F. Statham, B.A., F.G.S.

Vice-President — W. Ackland, Esq.

Hon. Secretary — Mr. Alfred H. Wall, 90, Cannon Street West, City.

Hon. Treasurer — Mr. Frank Howard, 12, Whittingham Villas, Studley Road, Stockwell.

Committee —

Mr. M. Hannaford.	Mr. N. E. Fitch.
T. Martin.	G. W. Simpson.
A. Herve.	J. A. Cotton.
J. C. Leake.	W. Clarke.

The Secretary hopes that their next meeting — the first in the open air—will be well attended. The usual committee meeting will be held at the Secretary's, in Cannon Street, on the second Wednesday of the month, at Half-past Seven in the evening.

* Omitted in our report of this Society's last pleasant meeting.

Letters to a Photographic Friend.

No. I.

My Dear Thompson,

According to promise I sit down to let you know what is doing in the great metropolis in the way of Novelties at the various Photographic Warehouses; and although I hear bitter complaints of the wet season putting a damper on this branch of trade, and the rifle movement entrenching on cash that would otherwise have been offered up as a sacrifice at the Temple of Sol, still I find ample material to occupy both time and paper in description.

On leaving my friends at Brighton, I made my way to London—not by rail, but by one of the few four-horse coaches that by some "law of natural selection" (as Darwin would call it) has been enabled to hold its own upon the surface of the earth in spite of its puffing, grunting, blustering *mailed* oppressor of the iron way, that displays its native obstinacy by setting at defiance the order of the Directors, that "no smoking is allowed," by smoking its hardest from one end of the line to the other, excepting at such times as it

stops to drink. You know how I love the clatter and dash of four well-appointed steeds as they bowl over old England's country highways ("*may their shadows never be less*," by-the-by), and force one into a closer union with the bracing air of our chalky Downs. During this jaunt I was particularly struck with the manner in which photography has established itself as one of the institutions of this country; for, from the time we left Brighton till the moment of our arrival in London, THE ART was in some form forcing itself upon our attention: now presenting itself as a fashionable "studio" within sight of our coach-office—then as the head-quarters of a pedestrianising member of "the profession," established in the back garden of a village cottage—presently peeping out at the first-floor window, over a tailor's shop, in a market town—anon in the shape of a van, lurking near the entrance to "the Lover's Walk," on the outskirts of a romantically-situated village. Even private houses seemed to be seized with the prevailing photo-mania; for, in a prettily situated cottage, at the foot of one of the celebrated Surrey hills, a glass excresence, of which "the purpose is perspicuous," stared us in the face, even in this retired spot, "far from the busy haunts of man." On asking our coachman the name of this residence, he said it bore the ominous designation of "*La Guillotine;*" and he believed that the proprietor had so christened it "cos it was where people *had their heads taken off*." If Benjamin Webster should ever feel disposed to give a representation of "The Dead Heart" in the neighbouring town of Dorking, he would certainly find the entrance-steps to this glass-room an excellent "property" for the last scene of that drama, if he could borrow them for the occasion.

Just beyond this spot we came upon a pannier-accoutered donkey laden with tent, camera, and materials that told of an amateur's arrangements for this hilly district. A few miles farther on our road and we met a hack cab with its windows closely blinded with yellow calico, that clearly indicated to what scientific purposes such a vehicle might be turned at last, till even that pariah, "cabby," might become the pioneer to science and art; and so at every turn of the road, and in many an unexpected leafy nook were there signs of the photographer being abroad, till the very threshold of mighty London was passed, and then photography was indeed everywhere rampant, from the door posts to the house tops, till one was disposed to paraphrase the *Lay of the Antient Mariner*—

> Photos, Photos everywhere,
> But never a one to keep.

One is almost led to believe that pathological investigations have of late occupied attention in photography; for you are doubtless aware that *the measles*, as affecting paper prints, has been carefully diagnosed by a professor of photography—that glass positives are frequently subject to attacks of *squamosis*—and that *elephantiasis* (an affection hitherto considered to be almost entirely confined to the inhabitants of tropical climates) is evidently becoming distressingly prevalent in this country, if one is to judge of the portraits that frequently come under notice; but whether the enlargement of the lower extremities of the patients (sitters) is due to constitutional or photographic disturbance of the human system is a matter perhaps open to question. But need one be surprised at these heliographic ailments when even Sol himself is suffering greatly this season from a scorbutic affection vaguely described as "dark spots?"

As we gradually stole upon the murky atmosphere of the great city I was reminded of the peculiar way in which the din of its streets and the resonance of the throbbing life within it impresses itself upon the sense of hearing after a long sojourn in the quiet country—a sensation to which I had been a stranger for many a year, now that, in these railway days, instead of imperceptibly creeping upon London, we rush into its very heart with the clatter of iron wheels and the shriek of steam whistles emulous of rivaling the turmoil of the metropolis itself. The day after my arrival I bent my steps towards "the Land of the West," that being the first district I intended making a foray on for *novelties photographic*. The result of my inquiries at the various establishments I will report to you in subsequent communications. In the meantime,

I remain, dear Thompson,
Yours photographically,
SIMEON HEADSMAN.

COLOURED DAGUERREOTYPE PLATES.—M. Touissant, of Rouen, has announced that he succeeds in fixing the colours of images on daguerreotype plates. He does not give the formula, because he cannot at present specify the precise quantities of the substances employed. The process consists in pouring a mixture of lucine and alloxane upon well polished plates.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Wednesday, the 4th inst., at the Literary and Philosophical Society's Rooms, 36, George Street,—Joseph Sidebotham, Esq., presiding.

Mr. John Persehouse and Mr. John Mason were elected members of the Society.

The CHAIRMAN called the attention of the members to the fact that the British Association for the Advancement of Science had resolved to accept the invitation from Manchester, and to hold their meeting for 1861 there; and as there would most likely be an exhibition of photographs, it would be well for members to be making preparations, so that a good show might be made on that occasion. He also said that he had lately been over to Paris, but had not seen anything at all new in the photographic way. Most of the photographers there worked with the clumsy old-fashioned walnut-wood cameras. This was to be attributed to the circumstance that there are scarcely any amateur photographers on the continent.

A MEMBER asked whether it was true that the arrangement of the pictures in the Salford Exhibition had been considerably altered by a member of the Society, without the sanction of the committee.

The CHAIRMAN said that it was commonly reported that Mr. J. L. Davies had made the alteration; and, although it was an unpleasant matter, still he considered it should not be passed over, and that it was due to Mr. Davies, as well as to the Society, thus to notice it, in order that Mr. Davies might have an opportunity of contradicting the report, if untrue.

Mr. W. T. MABLEY explained that the entire management and arrangements of the exhibition had been left to a committee of members. One of the rules was, that no pictures could be admitted unless they were sent through the committee. Mr. Davies had not complied with this rule, and, consequently, his pictures ought not to have been admitted at all, though nevertheless they had been admitted. One part of the room was much better lighted than the rest, and the committee had acted as they believed very fairly in hanging one or two of the best pictures of each exhibitor in this place: these pictures had since been taken down by some one, and Mr. Davies's pictures hung in their place. Who had removed them he did not know; but it was not with the sanction of the committee, who felt much aggrieved and insulted that their work should be undone and interfered with.

Mr. J. PARRY moved the following resolution:—"That the Honorary Secretary be requested to write to Mr. Plant, at the exhibition, expressing surprise that he should have allowed any one to alter the arrangements of the photographs without communicating with the committee; and also to Mr. Davies, asking for an explanation from him of his conduct."

This resolution was seconded by Mr. Heywood, and carried unanimously.

Mr. MABLEY further stated that it was a matter of very little importance where the pictures were hung, as the light was very good throughout the room; but such interference as had taken place was a most unwarrantable liberty, and an insult to the society. Several of the members expressed their strong disapprobation of the alleged conduct of Mr. Davies.

After a general discussion on various matters the meeting concluded at an early hour, the thanks of the meeting being first given to Mr. Sidebotham for presiding.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VII. *(Continued.)*

BACKGROUNDS.

IF you desire any objects introduced behind the figure they must, as I have before said, be very simple and unattractive in their character and few in number; their details, too, must rather be slightly indicated than closely imitated. (See maxims.) Study must also be devoted to the background as associated with the character of your subject: for instance—

Here is, say, a picture of a graceful girl, with the light gauzy drapery of summer fashion floating in swelling, tremulous clouds of transparent material over her—hem!—her crinoline. It is the production of an *artist* photographer, and he could not conscientiously represent anything so fairy-like with strong lights and powerful shadows; so, with true artistic feeling, he has secured

the most tender and delicate gradations he could obtain by a skilful arrangement of his blinds and reflecting screens, without endangering the existence of that roundness and relief necessary to avoid flatness. Now, if you put behind this poetically-treated production a strong dark background, all this beauty, all this poetry, becomes transformed into flatness, harshness of contrast, and a poor, weak, washed out, ineffective result, as unpleasing to the educated as to the uneducated eye.

Or, again, say the picture is one as artistic, of a fine intellectual male head, starting from the surface with its bright high lights and strongly-marked vigorous shadows. Place behind this a pale, delicately-rendered background, and it immediately becomes a sooty and offensive affair, which few would even tolerate and none admire.* (See maxims.)

Another warning I must also give is against introducing lights or shadows in unnatural proportions or positions, for the sake of some conventional or even otherwise legitimate effect. Shadows cannot always be soft and tender, or strong and deep: faint lights and faint shadows cannot exist together. Where the lights are broad and strong the shades must necessarily be faint, and with feeble lights the shadows must be proportionately strong.† The character of the light and shade of your object, then, should regulate that of your background, if you desire your picture to be truthful, as all real art should be. There is a kind of background frequently seen in coloured photographs which was introduced, I believe, by some of our French and German colourists, which is thus obtained:—

A cool, but not cold, grey, bodied with white, is thinly washed over the whole‡, upon this, when dry, the interior of a room, or a garden, or other out-door scene, is faintly indicated by a few smart dexterous touches of light and shade of a similar character; a thin glaze of colour—just the merest indication of colour—is then got with a carefully applied wash; and, by way of finish, a little colour of a more positive description is secured by the use of crayons, for which purpose I can recommend nothing better than Mr. Newman's "polycolor crayons," a few spirited touches from which will produce an especially good effect.

It is sometimes desirable to obtain backgrounds which are intended to embody the characteristic associations of your subject. Thus, military men are frequently represented with the plain of a past or coming battle spreading behind them to the horizon, on which the tents of an army are visible, with piled muskets, cannon, or any other relics of, or preparation for, the fight. A sailor loves a background of sea and rock, or the deck of a vessel. An artist or literary man will perhaps prefer something indicating his pursuits or particular studies. The scientific man that which indicates the peculiar branch of science he most affects. Many sitters have particular hobbies which they especially desire to be in some way or other associated with their portraits; and in theatrical character pictures a characteristic background considerably enhances the general effect. Such backgrounds require very judicious treatment and skilful management. Nothing must attract attention from the figure by its undue prominence (see maxims); and spottiness of colour, or of light and shade, should be carefully avoided. All the colours should be broken and subdued. I might add pages of information upon this subject, and describe many methods of securing effects which, according to my own experience, have been very pleasing; but, lest these articles should prove tediously long, I refrain. I shall content myself in quitting backgrounds by adding that these should not be attempted by colourists who have no knowledge of drawing, as by so doing they may merely spoil their more successful results in the face and figure. If you are not a good draughtsman, with due knowledge of the laws governing composition and *chiaroscuro*, you cannot do better than adhere to the plain backgrounds which I have described. Well-executed pictorial backgrounds are very seldom seen, and failures are but too generally of the greatest and ugliest.

* These remarks are, of course, as applicable to taking photographs as colouring them; and I shall be proud and happy if any remarks of this character which I have made or may make should induce some of our photographers to give more attention to the artistic in their studies.

† This should be remembered by such of our composition printers as use several negatives to produce one picture. It is a rule frequently violated in their compositions, in which a variety of conflicting lights and shadows may often be discovered.

‡ All body-colours dry lighter than they appear while wet.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

J. B.—Simply by adding a little oil to your maglip.

Amelia B.—Your chief object being the very praiseworthy one you name, I say, take your labour *now* into the market: your colouring is neither artistic nor what I could conscientiously call good, but it is neat, clean, and rather pretty; and I have seen work with no higher pretensions which has been executed for more than one of the most prominent, royally patronised, and loftily pretentious photographic establishments at the west end. As far as regards yourself, having been made acquainted with your excellent motive, I am glad to know there is a market for your labour; but I much regret that photographers of position should encourage a species of photographic colouring scarcely superior—if at all—to that associated with cheap lithographs and engravings, simply on the ground of its cheapness enlarging their profits. But if your work does not display very great present success, it is very promising; and I would earnestly advise that you should not be content to remain in the ranks of those who, taking up print after print with the mechanical labour of an unthinking hand, wash on a little "flesh colour" here, stipple a little pink there "as per pattern," *ad infinitum.* Look at the show cases of some colourists and you will understand my meaning. Cry "*excelsior!*" and take *nature* for your guide: for though our much-respected editor, Mr. Shadbolt, seems, in the last number of this Journal, to think it my business to add to photographs a charm unpossessed by nature, I certainly *aim* at contributing only to their perfect *truth*, in giving only the colours possessed by nature and not secured by photography.

Chromo.—Your production displays excellent promise. In its present state it is simply *tinted*, and requires finish. The flesh has little more than a wash of colour; it is neatly and cleanly done, however, and I have no doubt of your ultimate success in better things. A photograph from an engraving is a very bad subject to begin upon; especially when the proof is over-printed, but you should have done more to destroy the blackness of the shadows. So far so good, but you must go farther. I do not promise that in going farther you will not "fare worse," but failure is always the parent of success Your other queries will receive a private reply as soon as I have made certain enquiries

A Would-be Colourist.—"Contrast," Ruskin says, "best manifests the character of everything. Rest can only be enjoyed after labour; sound, to be heard clearly, must rise out of silence; light is exhibited by darkness, darkness by light, and so on in all things." Your specimen of colouring is entirely deficient of this important element. Not the smallest basis of cool, not to say cold, colouring does it contain in all its hot and fiery desert of yellows, reds, purples, crimsons, orange: now just sit down to the piano and try how a series of discords *sound*, and you will have some idea how these colours, thus assembled, *look*. Study Chevreul's book, and paint from nature: the one will give you the scientific theory, the other practice will guide you in its application. You evidently work too quickly. Let the touches be soft, faint, and tender, to obtain the effect gradually.

G. R. S.—Mr. Parris (the same who restored the paintings in St. Paul's) is one of our best photographic colourists. Carrick, no less celebrated an artist, is also much esteemed as a photographic painter. The marble medium was invented by the first-named gentleman, and used in repainting Sir James Thornhill's pictures. I have tried and like it. It dries very hard and dead. It is, I believe, a wax vehicle. I cannot answer your last question, but will see if I can procure the information for you from a friend who is very learned in all such matters.

Dabbler.—The ordinary oil colours will give you the same smoothness of surface, but you must regrind them bit by bit as they are used. The specimen is of the right tone and character for colouring, but it is a little over-printed (if for water).

A Painter.—I am grateful for your encouraging remarks. I believe, with Thackeray, that "art is truth, and truth is religion, and its study and practice a daily work of pious duty:" and I therefore feel no little pride or pleasure in advocating its cause, or defending it from misrepresentation. But you are not just to the good friends who are not of our opinion in this matter: a man should be judged by *his aims*, and not the *means* he adopts to secure their end; and, no matter what his vocation may be, if he is worth a brass farthing, he will uphold it in the world's esteem. I have had much experience in their use, all of which will be embodied in future portions of these articles. Good bye! I suspect you could do more for "the cause" than I. Why not do so?

New Books.

Ackland's Hints on Fothergill's Process.

Horne & Thornthwaite, Newgate Street, London.

We believe that this is a new edition of a little pamphlet which we noticed on a former occasion, but, if so, it has been to a considerable extent re-written. Although some of the details of the manipulation recommended are to the experienced photographer needlessly prolix, upon the whole the directions given are based generally upon sound principles, and therefore may be taken by the novice as safe guides toward the acquirement of presentable negatives.

We are of opinion that a little too much mystery is introduced into the discussion of the character of the collodion suitable for the process. We have never found any kind upon which good pictures can be taken with the wet process that cannot, by judicious management, be made available for the dry one based upon Fothergill's method; but we readily admit that it is far easier to do this with some kinds than with others. We are pleased to find that Mr. Ackland progresses with the times, and does not hesitate to amend what was deficient in his earlier treatise. As a sample of the style we extract the

"CONCLUDING HINTS.

"Clean the glass plates carefully with very clean cloths, avoiding especially those used to wipe the hands after coating with albumen.

"Filter the bath solution whenever about to prepare a lot of plates; and, when not in use, keep it in a stoppered bottle, in a dark corner of the operating room, so that the full glare of daylight may at no time fall on it.

"Allow the collodion to set thoroughly before immersion in the nitrate bath, or it may become detached in washing or after fixing; but, as a matter of course, this must not be carried so far that any part may become dry, or the nitrate bath will act unequally on the film.

"Iodised collodion that has become too thick for use by evaporation may be diluted with rectified sulphuric ether; but *methylated* ether must not be used for this purpose.

"After sensitising the collodion film, wash as described, and do not allow water to fall directly on the surface of the plate, or unequal patches will show themselves in developing.

"The dilute albumen that has been employed to coat one plate must be thrown away, and a second quantity taken for the next plate.

"Use two globe plate-holders, one for collodionising the plate, and the second for coating with albumen; but carefully avoid using the one ordinarily employed for the albumen to coat a plate with collodion, as albumen would thus be introduced into the bath solution, which would speedily spoil it for the purpose.

"Handle the coated plate as little as possible, and always wash the hands after coating with albumen, before removing another plate from the bath; indeed, never take up a plate without washing and drying the hands on a clean towel.

"Give a full exposure in the camera, or the resulting negative will be harsh, and produce black and white prints without middle tints.

"Keep the glass used for the developing mixture perfectly clean.

"Take especial care that no gleam of white light falls on the plates during preparation or drying, and when dry, stow away in *light-tight* boxes of mahogany or tin, if not required for immediate use.

"In developing, take especial care that the developing fluid is kept on the move by being repeatedly poured on and off the plate, or mottling will be the result.

"Guard against over-development, as a comparatively weak negative by this process will print well, owing to the nature of the deposit forming the shades having a greater action, in stopping the light whilst printing, than that produced by the ordinary collodion process.

"I have thus given what I hope will prove a clear description of this beautiful process, and as success with it follows only from paying attention to *minute* particulars, I would ask those who are led to make a trial of it from my description, to *strictly* follow the plan I have laid down, as a slight alteration of manipulation frequently gives rise to vexatious failures. Should any difficulty arise, I shall be happy to answer any queries by post; but it would much facilitate my doing so if such queries were written on paper, distinct from the letter which accompanies it, leaving sufficient space between each query for my reply."

From the same pamphlet we also give the following, as useful to some of our readers:—

"BATH TESTER.

"In working with either the wet or dry collodion process, and in printing paper positives, it is absolutely essential that the bath solution should be preserved as near as possible to its original strength; and if it falls much below this strength, nitrate of silver must be added to supply the deficiency.

"Many instruments have been devised for this purpose, but the form shown by Fig 1 is the most simple in action, and sufficiently exact for the purpose. To use it we must proceed as follows:—

"Take of highly dried and perfectly pure chloride of sodium 84¼ grains, and dissolve it in 20 ounces of distilled water. This forms the test solution, and requires to be made with exactness, or the result obtained by its use will be erroneous. A second solution is also needed; this is made by dissolving twenty grains of bichromate of potash in one ounce of water.

"To test the strength of a bath solution, take the bath tester, Fig 1, and drop into it ONE DROP *only* of bichromate of potash solution, then fill the tube up to the lowest division, marked 0, with the bath solution, and add the standard test solution gradually, shaking at frequent intervals; when the colour of the precipitate, which was at first brick red, changes to a lighter tint, add the test solution more gradually, and continue to shake up between each addition. Continue to add the test solution drop by drop until the red tint of the precipitate suddenly changes to white, showing that all the nitrate of silver is decomposed, and that enough test solution has been added. Now read off the division on the level with the surface of the fluid in the bath tester, and it will be equal to the number of grains of nitrate of silver contained in each ounce of the bath solution. Thus, supposing, after having performed the experiment, the fluid in the bath tester stood level with the 39th division (counting from below upwards, the same as the tube is figured), this would indicate that each ounce of the bath solution tested contained 39 grains of nitrate of silver.

"This plan of using bichromate of potash to show by a change of colour when all the nitrate of silver is converted into chloride was published some years since in the *Journal of the Photographic Society*, and although but little used, answers perfectly in all cases except to test the aceto-nitrate of silver bath, after having been used to excite collodio-albumen plates. In this case, the precipitate which forms on adding the test solution remains coloured, however much is added; therefore, the use of the bichromate of potash solution must here be dispensed with, and the test solution added gradually, shaking after each addition, and allowing the white chloride of silver which is formed to settle down, until the test solution ceases to produce any more cloudiness in the clear portion of the contents. The division level with the surface of the fluid in the bath-tester here also indicates the number of grains of nitrate of silver per ounce."

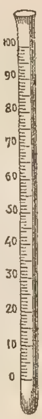


FIG. 1.

Foreign Correspondence.

Paris, July 10, 1860.

THERE is much talk here at present of a new and important application of photography, which has just received an official consecration from the Academy of Sciences, in a report by Mons. Laugier, one of the most distinguished members of that celebrated society: I speak of the employment of photography for surveying and for reconnoitering. Recently, Mons. Laussédat, Captain of Engineers, presented to the Academy a long and interesting paper on the subject, containing quite a system which the author had himself practised, and the advantages of which he had proved. I do not intend to repeat here a description of that system, but I will call your attention to Mons. Laugier's report, giving a *resumé* of it, which is published in the *Lumière* of this week. It is true that photographic processes were already used for the reproduction and reduction of maps and topographic plans. While at Brussels, in 1856, I saw an *atelier* which was installed at the War Ministry for this special purpose, under the direction of Mons. Libois, a staff-officer, and a very able operator. At the same period, Mons. Riffaut was entrusted by the French administration with the transferring of copies of a similar nature upon steel by means of heliographic engraving. At various times Russian and Sardinian officers have been sent to Mons. Nièpce de Saint Victor, to study his processes; and we learn from the recent publication of Colonel James's process that such labours continue to occupy attention in England. But it is not merely as a supplement to the means already employed by the surveyor that Mons. Laussédat proposes photography—it is to the original production of plans that he applies it. He thus opens a wide and, as yet, unexplored field to our art, and renders to science a large service.

Another general theme of conversation at Paris is the diminution of the sun's light. You know with what impatience we Parisian folks await each year the sunny days. The month of March has scarce gone by when we complain that the temperature is still wanting in vernal suavity—that the heavens are not yet wholly azure—that the trees hasten not to clothe themselves with blossoms. Spring-tide is the sovereign cure of all our ills. The sun is our chief comforter. He it is who makes us see all things in rosy hues; and, were we in philosophic mood, to study the influence which he exerts upon our destinies, we should arrive at unlooked-for conclusions. On a rainy day the Frenchman, and above all, the Parisian, loses fifty per cent. of his real value. Judge, then, of the state we must be in this year, when spring has failed us, and when summer lets the Julian month pass by, and deigns, so to speak, no token of its presence. We began by grumbling, and then we grew to be uneasy: we asked what might be the cause of the season's protracted inclemency. We were told that the sun's spots had taken considerable development, and that they changed their aspect at every instant. Now, if the dark portion of the sun's disc had grown, the luminous portion had become so much the less; hence there resulted for us diminution of light and concurrent diminution of caloric. Such is the reasoning put forward to account for the unusually inclement season. To confirm this theory, however, it should be ascertained whether the so-called lowering of the temperature has taken place throughout the globe; for, if the sun has really lost a portion of its heat and power, it will be felt more or less everywhere. The fact, interesting for everyone, is especially so for photographers; and their observations might perhaps aid science in the re-solution of the problem. I have, indeed, for some time past, heard not a few of our artists complain of accidents in their operations—of want of success to them inexplicable; but such things often happen, and cannot, without positive experiments, be attributed to the phenomenon we are speaking of. Besides, I do not know that the time of exposure has in general to be prolonged, which would be the case if the sun had in reality lost in intensity. Our friend and *collaborateur*, Mons. A. Gaudin, says that the decrease of the solar light is in the proportion of one per cent. He proposes that photographers in various countries should make experiments in this direction, and that they should take the solar image at various hours of the day. Pictures of this kind, carefully made, would be valuable documents for scientific men. Mr. Warren De la Rue, who has already successfully applied photography to astronomical observations, might supply useful instructions for such experiments.

While I am speaking of the diminution of the solar light, let me mention the incredible increase in the number of itinerant photographers. They are now a-days become a very plague, somewhat like the swarms of locusts which fell in ancient times upon the land of Egypt. Probably you in England know not this modern tribe getting their living with the big drum and the objective, and holding a place midway between the artist and the mountebank. If so, I congratulate you on such exemption. The first that was seen appeared two or three years since at a suburban *fête*, with a daughter of Anak on one hand and a child with two heads on the other. He appears to have made money, for he very soon had imitators. First it was an enterprise conducted by one man, who had representatives and branch establishments at all the fairs in the environs of Paris. Now the tribe, grown and multiplied, has invaded the capital. Its members set up their dwellings along the Boulevards which surround Paris, and which, before the extension of the city at the commencement of this year, formed its boundaries. A few planks covered with an awning compose the establishment. At times a coffee or a beer shop is attached to the operating-room. The wife supplies the customers with drink, and entertains them with a *select* conversation, while the husband is occupied with the manipulations. In the interior, every piece of waste ground arising from the demolitions which are rendered necessary by the opening of new Boulevards, every house in course of construction, is seized upon by these nomadic artists. On the Boulevard de Sébastopol, one of the largest and finest streets recently opened, from twenty to thirty at least may be counted. They put up sign-boards illustrated with fantastic symbols, and distinguished by their barbarous style. They call themselves the

"collaborators of the sun," and inscribe over their doors, "*Au génie de la photographie*,"—"*Aux merveilles du nouvel art*,"—"*Aux fils de Daguerre*,"—&c. Some of the directors of these establishments think themselves bound to let their hair grow, and to assume a *characteristic* costume to represent their art more worthily. There is one who is dressed as an Arkansas trapper, to resemble as much as possible the hero of a popular novel. Generally in these galleries they execute positives upon glass, or transferred to waxed cloth. The portraits are announced as costing one franc; but it is rare for the unwary passer who enters to come away for less than five or six francs, for he yields nearly always to the charms of a picture of larger dimensions, or with an ornamented frame. I have seen some of these portraits: now and then they are tolerable, but woe to those whose hair is blond!—they are sure to have a portrait of the darkest hue.

May the fates preserve you from strolling photographers!

ERNEST LACAN.

TO OUR READERS.

To meet the additional expense incurred for carriage and postage of this Journal throughout the Provinces, arising from the great bulk it has now assumed through the increased amount of matter published in each number, our Provincial Agents will be compelled to charge this and all future numbers at 4d. each. The price to purchasers in London and Liverpool will remain the same as at present, namely, 3d.; and subscribers can still have it forwarded direct from the publisher as heretofore upon payment of 8s. per annum IN ADVANCE.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

ERRATUM.—*In a portion of our present impression a printer's error occurs. In the first of Mr. Wall's "Answers to Correspondents," page 211, "maglip" should be "magilp."—The mistake occurred through a "transposition" of the line.*

FADED GLASS POSITIVES, &c.

To the EDITOR.

SIR,—I beg to thank you for your satisfactory solution of my several queries contained in the last issue of your much-valued serial. By this evening's post I purpose forwarding you one of the unfortunate yellowed proofs mentioned in my last epistle, being lucky in having kept a supernumerary one as a remembrance of its respected original (in her eighty-ninth year), which I have returned, quite perfect, in place of the one about to be sent you. You will thus be enabled to form a better opinion of the correctness or otherwise of your surmise respecting the cause of the change of colour that has taken place. The following addition to my former statement may tend to assist your further judgment of the matter:—Some time since, finding myself unexpectedly minus nitrate of silver, I purchased a small quantity at a neighbouring town, and, not having a phial with me, brought it home in paper. Through forgetfulness it thus remained for a fortnight or longer, when on opening the packet a portion of the salt had become discoloured and useless for ordinary purposes. I suppose it had deliquesed, and become contaminated with a part of the organic matter or impurities of the material containing the nitrate. Fancying that the solution of cyanide of potassium increased the whiteness and silvery tone of the picture in direct proportion as it was well charged with silver, I have been in the habit of occasionally adding to it from my exciting bath stock bottle a portion of its contents; and I may have been more liberal of this expensive chemical of late, foolishly thinking thus to economise my partially decomposed and otherwise useless silver salt, by using it in place of the bath solution as heretofore. The only way that I can account for the other three proofs taken at the same time, and fixed and varnished with the same chemicals, not having shared the same fate as the one now about to be sent you is, that my cyanide bottle may have been short of solution at the time, and I may have refilled it after taking off the first proof from my cyanide stock bottle, which is without silver, and always stands ready at hand.

Allow me to correct a doubt, raised in my last letter, respecting the propriety of using albumen on glass positives, in consequence of the phosphorous and sulphur I had supposed it to contain. I now find albumen to be a very simple fluid, consisting principally of carbon, its other constituents being three harmless gases, the phosphorous and sulphur of the egg being entirely confined to the yolk.

A short time since the proprietors of copyright of engravings and prints appeared determined, by advertisement, to suppress the sale of photographic copies taken from their works. To my surprise I see these copies offered for sale as plentifully and generally as before. Taking it for granted that the parties thus exposing them in their shop windows cannot (all of them at least) have obtained leave from owners of copyrights for so doing, will you kindly tell me whether the restriction holds good with all engravings, or whether it be confined to a certain few—it may be registered ones? If the former, whether the prohibition applies also to amateurs who may be inclined to copy a certain print or prints for gratuitous distribution among their friends?

Having made the above inquiry among my photographic acquaintances, as well as from gentlemen skilled in the law, not leaving unasked the shopkeepers themselves, and without obtaining the information sought for, I am led to believe that such particulars are not commonly known,—may I trespass still further on your usual readiness to oblige by requesting your opinion on the abovenamed points?

To induce others better acquainted with the alabastrine process than myself to make known the results of their experience, I would state that I have recently become possessed of a proof, whitened by bichloride of mercury more than six years since, which still retains its original purity and brightness. As a further test of the permanency of alabastrine pictures, the one in question, during two-thirds of the six years, has been thrown aside in a dark lumber-room, and at the same time exposed to the deleterious exhalations and gases of the crowded town of Plymouth. The spare solubility of bichloride of mercury in water renders it difficult of being washed out of the whitened proof, more especially its last remaining traces, which have sunk deep into and saturated the collodion film. Could there be any objection to flooding the picture with dilute hydrochloric acid, in which fluid the bichloride is instantly soluble, prior to its final washing? Calomel, of which the whitened surface of the alabastrine picture is principally composed, is not soluble in hydrochloric acid, consequently the brightness of the proof could not be injured by its use.

I certainly feel great reluctance in thus troubling you, and more especially in occupying space in your very practical periodical which would otherwise have been filled with more useful matter, still from the pleasure and frequent profit I have derived from the perusal of your answers to various correspondents, I have been induced to do so in the hopes that others may be led to record their failures and their difficulties, which frequently result in the exposition of useful facts that might otherwise have remained known to only a few. Wishing you success in all your undertakings,—I am, yours, &c., HENRY H. HELE.

July 3rd, 1860.

[We are more than ever convinced of the correctness of our surmise relative to the cause of your glass positive having become faded since inspecting it and reading the preceding letter. We regard the addition of a silver salt, in any considerable quantity, to the cyanide solution as a decided mistake. Weaken the energy of your fixing bath, if too great, by dilution with water.

We are not disposed to acquiesce in the correctness of your present opinion relative to the harmless nature of albumen, or rather the white of an egg, which, though consisting principally of albumen, contains besides an alkali, small quantities of chloride of sodium, sulphate and phosphate of soda, phosphate of lime, &c., quite sufficient to interfere with the stability of the reduced silver on the film.

It is possible that the photographs to which you allude may have been taken from prints the copyright of which has expired. We should scarcely think of replying to a purely legal question, but we believe that there exists considerable uncertainty as to the actual state of the law upon the point raised.

We have had no personal experience on alabastrine positives, if by that term you intend anything beyond positives whitened by solution of bichloride of mercury in dilute hydrochloric acid, as originally introduced by Archer. Possibly our correspondent, Mr. G. W. Simpson, may be inclined to favour you with some hints on the subject.—ED.]

THE FOTHERGILL PROCESS.

To the EDITOR.

SIR,—As some of your readers may be operating with the Fothergill process, and fancy they are working it with a short exposure (some say short if it be only three and a half or four minutes), I may just mention that I am now giving from fifteen to twenty-five seconds exposure, with a double achromatic quarter plate lens, and five-eighth inch stop. I should like to know if any one else is succeeding with the same exposure?

Enclosed are specimens. One is a view in Healey Thnitch, near Rochdale, a wild, romantic spot, and worth the visit of photographers, as there might be half-a-dozen good views obtained. The exposure for this was twenty seconds, at eleven o'clock a.m., April 7th, 1860.

The next is *Lover's Walk, Littleborough;* a nice bit of scenery. Exposure fifteen seconds, April 14th, 1860.

Lastly, a view of an old baronial hall, *Pike House, near Littleborough.* Exposure, twenty-five seconds, April 24th, 1860.—I am, yours, &c.,

A. WHITHAM.

[The prints are somewhat grey and flat in colour; but it is evident that the negatives are capable of yielding much better proofs, the exposure having been quite sufficient to impress the detail of the shadows. With so large an aperture as five-eighths of an inch the exposure of twenty seconds is equal to that of two minutes with a quarter-inch stop, or *eight minutes* with one of one-eighth of an inch—a size not at all uncommon with stereoscopic lenses for taking landscapes, as where much "distance" is included the effect produced is far richer than in those before us.—ED.]

PORTRAITS IN SITTING ROOMS.

To the Editor.

Sir,—Having been a reader of your Journal for some months, and finding it contain milk for the babes of the black art as well as strong meat for the men, I am induced, as one of the former, to trouble you with the following questions:—

1. Wishing to take portraits in a room lighted with one window facing east, how must I place my sitter?

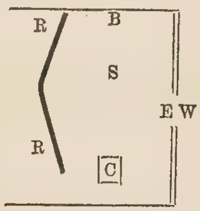
2. What background is most suitable for alabastrine pictures?

3. Should the formula for re-developing solution for alabastrines contain iron,—and how much?

4. Are kaolin and China clay the same.—I am, yours, &c.,

A BABE AND SUCKLING.

[1. Place the sitter with one *side* next to the window, and illuminate the other side by means of a pair of white screens, folding after the manner of a clothes horse, and place the camera opposite the sitter thus—



E W, east window; S, sitter; B, background; R R, reflectors; C, camera.

Lay a white sheet or drugget on the floor in front of the sitter, and a piece of white calico in an inclined oblique position over the sitter, so as to reflect light upon the top of the head.

2. A shade of grey, just dark enough to contrast with, and throw up the face, or a brown paper colour is very good when a contrast with very light dresses is desirable.

3. The formula for the so-called "re-developing solution" is a trade secret. If any iron salt enters into its composition it probably is the perchloride in small quantity.

Mr. Archer's formula for *whitening* positives is:—

Perchloride of mercury	2	drachms.
Hydrochloric acid	2	"
Water	6	"

One part of the above solution to ten parts of water may be used for re-developing.

4. Kaolin is the same as China clay, but the Chinese mineral, *petuntze*, (peh-tun-tsz), is sometimes called China clay in error.—Ed.]

M. PESCHARD'S PROCESS.

To the Editor.

Sir,—Every now and then the photographic world is startled with the surprising announcement of *a* new *dry process*, which generally turns out to be no more new than photography itself.

In your last number appeared one of these announcements, by M. Peschard; and what in the name of all that's photographic there is new in this process I cannot conceive. About twelve months ago I was experimenting in the direction indicated, and I think tried most of the gums and resins soluble in ether, which were added to the collodion in a similar manner as that described by M. Peschard. The result of these experiments I published in the pages of a contemporary.

Not that I wish to claim the discovery of this process, as I believe Mr. Hardwich gives a description of one somewhat similar; nor do I doubt that the present discoverer has published this process in ignorance of its having appeared before.

The results, however, are far from being as satisfactory as I was first led to suppose; the plates rarely developing free from stains, owing, I think, to a partial decomposition of the nitrate of silver remaining in the pores of the film.

There are two other great drawbacks to this process:—first, the plates will not keep over a few days; and, secondly, one half the plate is generally more sensitive than the other, owing to accumulation of the nitrate of silver at the lower end of the plate in draining.

With regard to the sensitiveness of these plates, I may mention that I have taken views in five seconds; this is the only quality which can recommend them at present. But still I would say, "*nil desperandum.*" Why may not something be found to add to the collodion instead of applying preservatives afterwards?—I am, yours, &c.,

Shooter's Hill, 3*rd July*, 1860. THOMAS CLARK.

[The communication of M. Peschard is one that has been in type some time, and came through one of our *collaborateurs*. The only novelty in it consisted in the combination of rosin with Peruvian balsam, the former ingredient having been employed by M. l'Abbé Despratz and others. We have but little faith in the principle involved of adding a so-called preservative agent to the collodion itself, and have never yet seen a picture produced by following it that has been entirely free from defects, and those of a serious nature. It is *possible* that by adding some adhesive resin to keep the film on the glass something useful might accrue, but it should be one *inactive* as a photographic agent.—Ed.]

TONING.

To the Editor.

Sir,—The following is the result of some experiments recently made with an alkaline gold toning bath, which, if of sufficient interest, you are at liberty to publish:—

TONING BATH.

Water	20	ounces.
Hyposulphite of soda	5	"
Carbonate of soda	20	grains.
Chloride of gold	10	"

The first dozen toned in this bath in 15 minutes, the second 20, the third 25, and the fourth 30.

I then added five grains of chloride gold to revive it, when the first dozen toned in 20 minutes, the second in 30, the third in 45, and the fourth in 70,—the proofs declining in vigour in proportion to the length of time taken in toning.

It would appear from these experiments that the above bath is capable of toning about fifty stereographs without further addition of chloride of gold, and if it is desired to tone any more in the same bath (a plan not to be recommended) gold must be added in proportion to the number of prints—thus, if two dozen are to be toned, add five grains of chloride of gold, if four dozen, ten grains, and so on.—I am, yours, &c.,

THOMAS CLARK.

[It has many times been remarked that it is as useful to record failures as successful operations; but we may now add that it is useful to record *misapprehensions*, for we certainly never should have imagined, without the evidence before us, that any one could have supposed the formula above given to be what is known as "the alkaline *gold* toning bath." We know of but one kind of toning bath likely to be more injurious in its operation than the preceding, that is one in which the few grains of carbonate of soda are omitted; but we do not hesitate to condemn this one in very strong terms, for faded proofs must ultimately be the result of its use.—Ed.]

ANSWERS TO CORRESPONDENTS.

Querist.—Already replied to.

J. Cranmer.—Not likely; but you can try.

A. B. C.—There is no royal road to photography. You must feel your way gradually.

Well-wisher is thanked for his note and the compliments it contains.

J. H. W.—Makers—No. 1 best, then No. 4; after these, 5, 8, 12. Dealers—13, 16, 18.

S. A. G.—We think you will find the Fothergill process best suited for your requirements.

J. H. L.—The matter of your letter we should be happy to publish, but the style is inappropriate.

P. Jones.—We have forwarded your note, but cannot promise that you will receive any reply *direct*.

A Lad in Trouble.—You have simply omitted to *fix* your proof—use a solution of hyposulphite of soda.

R. Hulett.—Nos. 5 and 1 equal and *far* above the others. No. 3 comes next in excellence; then 8, 6, and 2.

Eric.—We believe that it is to be procured; in fact, we have no doubt of it. Address simply "Wolverhampton," and it will reach him.

T. W. C.—The diffused light of the fire does not affect the plates; but we gave all the information contained in the pamphlet.

John Howard.—Exhibition not yet fixed—most probably at Manchester, about this time next year. For developer, dissolve by heat in one ounce distilled water 320 grains protosulphate of iron; also in the same way 300 grains of nitrate of barytes in three ounces of distilled water; mix while hot; a white precipitate will be formed, which filter away, and keep the liquid in a closely corked bottle quite full. This requires *no* addition of acetic or other acid, but will not "keep" long.

Maxwell.—Albumenised paper to be depended upon is very difficult to procure just now, as we hear from very many professional photographers. We have reason to believe that, as a rule, the fault lies with the *paper*, and not with the albumen, though doubtless the latter is sometimes the culprit. If you can prepare your own, we recommend you to *try* Hollingsworth's paper: we do not know that it will answer your purpose, but we have reason to think it will.

Dirty Fingers.—It is possible that, by coating them with india-rubber solution (procurable at the mackintosh shops), you might make them do; but what we recommend to you are simply some india-rubber *finger-stalls* (cost about threepence each), reaching to about the middle joint of the fingers. We find that, with one on the thumb and one on each of the two next fingers of the *left* hand, we rarely make a mess of our own; but there is no difficulty in performing most of the operations with all the fingers on both hands protected.

S. L. (or F. L.)—We fear that the paper is quite deficient in chloride; you may possibly make it work by floating it for several minutes, say five, upon a solution of chloride of ammonium, twenty grains to the ounce of water, and drying it previously to sensitising in the usual way. The paper is not good, and we perceive that the whole of the size has been removed.

You may print glass stereographs upon plain or ground plates as you please—the former is the simpler plan, and you may view them with a sheet of white paper under them, or a piece of ground glass in the stereoscope. Some operators produce the effect of ground-glass by means of a varnish.

M. C. C.—1. We have rendered available several defective pneumatic plate-holders by attaching to the faulty surface moderately thick sheet india-rubber, by means of the ordinary india-rubber solution. It requires, however, ten days or a fortnight to be allowed to ensure the proper amount of adhesion. We found some little difficulty in procuring a small piece of sheet india-rubber, so made use of one of the common india-rubber (*not* vulcanised) tobacco pouches—cost one shilling.

2. The pyroxyline is doubtless decomposed, and the film powdery, hence your annoyance. Add some collodion of a tenacious quality, freshly made, and you may overcome it. Allowing the film to dry too much before immersion in the sensitising bath sometimes gives rise to the inconvenience named.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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We find in the pages of a German contemporary an article by P. Liesegang, on Positive Printing, which contains some useful suggestions, and which we should have been inclined to have reproduced in full, but for the fact that an *impromptu sel d'or* toning bath is recommended, a movement which we regard as retrograde. We propose, however, to indicate the *modus operandi* advocated as being worthy of attention. It is as follows:—

To produce a fine, clear, and vigorous proof, with bright lights, purple shadows, and rosy half tints, the chief points requisite are: 1st. Paper with a hard smooth surface, upon which the picture may lie without sinking into the substance. 2nd. The presence of acid in the sensitising bath to secure clearness and brilliancy. 3rd. That no more silver salt be contained in the paper than is sufficient to secure a good print. 4th. The employment of the proper light for printing, sunlight only being used for very powerful negatives. 5th. The greatest cleanliness in all the vessels and solutions used. 6th. The sensitising and toning to be performed in the dark. For the preparation of the paper, instead of albumen, arrowroot is recommended, upon which it is asserted that proofs can be obtained equalling those upon albumen in delicacy, but without the objectionable gloss. German paper is preferred (naturally); each sheet is to be fastened, smooth side upwards, upon a flat board, and with a clean damp sponge a thin coating of the arrowroot mixture is to be laid on with a very light touch, so as not to roughen the surface of the paper; the slight lines left by the first sponge to be effaced by a few delicate touches with a second sponge, damp and scrupulously clean.

The arrowroot mixture is composed thus:—In five ounces of distilled water dissolve one hundred grains of chloride of sodium, and one grain of citric acid; filter into a clean vessel, and add eighty grains of pure arrowroot; heat the whole until it boils, stirring all the time with a glass rod; and allow it to cool. Before using the paste thus prepared remove the film formed on the surface when cooling. The sensitising bath consists of sixty grains of nitrate of silver to each ounce of water, with the addition of one drop of nitric acid. For papers sensitised upon this bath a toning bath of *sel d'or* of a strength of about half a grain to each ounce of water is directed; but, for papers sensitised upon a bath of ammonio-nitrate of silver (eighty grains to the ounce), a toning bath analogous to one suggested by Mr. Burnett in a former number of this Journal is to be employed. The toning bath is thus made:—Dissolve 60 grains of hyposulphite of soda in one ounce of distilled water; pour half of the solution into another vessel, and add to it half a grain of double chloride of platinum and sodium; then dissolve ten grains of nitrate of silver in one drachm of water, and add one drop of hydrochloric acid; a white precipitate is formed, which is left to be darkened in the light—this is to be dissolved in the other half of the hyposulphite of soda solution; mix the two portions and allow them to stand for some hours until a grey precipitate has fallen. This bath produces a fine brown tone.

The principal novelty in the preceding is the use of arrowroot as a vehicle for the sensitive chemicals, the paper being merely intended to act as a support. The principle involved is therefore identical with that advocated by us in a paper read before the Photographic Society between three and four years back, entitled, *Observations on Positive Printing*, and which will, on reference to the *Journal of the Photographic Society* for the period specified, be found recorded. Since that time we have found no reason to change the opinion then expressed upon this point, that the great desideratum is to keep the image as much as possible on the surface of the paper; and we therefore cordially coincide with the views held by our German *confrère*. The material of which we availed ourself for the purpose was gum tragacanth: it is by no means improbable that arrowroot may be preferable, and it is certainly easier to prepare properly. The use of a slightly acid sensitising bath is well known to assist in keeping the lights pure upon albumenised paper: analogy would therefore lead us to suppose that the same may apply to arrowroot; and, if memory do not play us a trick, Mr. Mabley found that it was advantageous to employ a small quantity of free acid in the nitrate bath, as it facilitates the subsequent operation of toning.

That no more free nitrate of silver than is quite sufficient for the purpose should be used is a proposition that recommends itself, both on the score of economy and to prevent the image being formed in the fabric of the paper; and the instruction to perform the operation of toning in the dark room is one that we consider deserving the utmost attention. We have no doubt whatever that many a spoilt proof is due to its exposure during this part of the process to ordinary daylight; indeed, we have not unfrequently seen two prints in one toning bath turn out one good and the other useless, in consequence of the under one having been protected from the light by the upper one, which was exposed to it. We are glad to find our own views so completely corroborated by an independent observer.

It is gratifying to record that the expedition to Spain, under the leadership of the Astronomer Royal, for the purpose of observing the eclipse of the sun, which occurred on the 18th ultimo, has proved eminently successful, especially as regards the photographic department; for a telegraphic message in the following words was published in London on the 19th:—"The success was complete: we have two photographs of the red flames, which prove that they belong to the sun, and many photographs of other phases." The camera is thus turned into an astronomical assistant, who does not let fancy run away with him or imagination play fantastic tricks, and one that is also free from any "personal equation." We have learnt that dry plates of various kinds—viz., Taupenot's, Fothergill's, metagelatine, and Dr. Hill Norris's, were taken out, as also some sensitised chloride paper, in one of Marion's preservative cases. It is highly interesting to note how, step by step, photography is pressed into the service of almost every branch of science, commencing generally with an amusing experiment, and ending by becoming an indispensable adjunct.

On perusing M. Claudet's paper *On the Principles of the Solar Camera*, recently read before the Members of the British Association for the Advancement of Science, we should certainly have been tempted to conclude that this celebrated photographer had never looked through a well-constructed microscope, had we not had ocular demonstration of the contrary. We fear, however, that on these occasions he had eyes which saw not, or at any rate did not heed, otherwise he could not possibly have failed to have been struck with the fact that "the principle" which he says "has not yet been explained even by the inventor himself in the specification of his patent," is precisely that which is acted upon in using with the achromatic microscope an ordinary Woollaston's condenser attached to the sub-stage; and that what M. Claudet proposes as an improvement in the solar camera, is simply the adoption of the improvement long since effected in the ordinary Woollaston's condenser by rendering it achromatic. We have before now asserted that for enlarging photographic negatives nothing more perfect could possibly be devised than that which already exists in a first-class microscope, it being simply a question of the size of the instrument. M. Claudet has come to the same conclusion, though by a different route; but, being unfamiliar with microscopical manipulation, he is not aware that, when examining any transparent object by the assistance of the achromatic condenser, all the conditions upon which he insists as essential to the perfect performance of the solar camera are rigidly fulfilled. M. Bertsch, on the contrary, is evidently a practised microscopist, as is evidenced by a communication made by him to the French Photographic Society at its last June meeting—a translation of which will be found in another column, and one to a similar effect in a former number—in which this gentleman points out that rays rendered convergent by a simple homogeneous lens are necessarily dispersed, in consequence of the varying refrangibility of the different coloured rays; and the disturbance is still further aggravated by some of the rays falling more obliquely than others upon the glass of the negative, are refracted with greater force, and, traversing a longer distance through it, the separation between the blue and red end of the spectrum becomes so great that it is hopeless to expect to obtain a sharp image with such defective illumination.

To convince anyone of the importance of this objection it is only necessary to show them any ordinary test object under the microscope, such as the *Pleurosigma angulatum*, or one still less severe, the *Pleurosigma hippocampus*—illuminating first by means of the Woollaston, and subsequently by the achromatic, condenser. In the former case the markings appear blurred and indistinct; in the latter sharp and clear, without any alteration of the optical part of the instrument.

We trust that M. Claudet will put himself in communication with M. Bertsch. The former is too good a photographer to be content with anything but the best results; and in his advocacy of the advisability of turning attention to the production of large pictures, *via* small negatives, we cordially concur: it is a point to which we have been for some time past endeavouring to urge our most energetic operators.

The collodio-albumen process has long been a deservedly favourite one: too many, however, are very apt to complain of the tediousness and the uncertainty of the preparation, which they allege deteriorates sadly from the pleasure they feel in the subsequent development. We are informed that experiments in rather a new direction will tend to remove some of the causes which have given rise to these complaints. We believe that probably before our next we shall be in possession of the particulars; and should it occur to our readers meanwhile to elect a favourite, we would recommend them, in election phraseology, to "reserve their pledges" until they have seen the report we have alluded to.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

In an article which appeared not long since in these pages, from the pen of Mr. Wall, allusion was made to a very beautiful study recently produced by Mr. Rejlander, the subject being *The Head of John the Baptist.* Although we had a copy of this artistic work then in our possession we abstained from more than a casual notice of it, because our attention was then directed more to the question of the legitimacy or illegitimacy of "printing from several negatives" than to the peculiar merits of this one of Mr. Rejlander's compositions, and hitherto the opportunity of again reverting to this production has been wanting. It is, however, at the moment of writing before us, and we have, while noticing with much gratification the satisfactory result obtained, to offer a few remarks *en passant.*

In this composition there are no harsh lines, nor is it possible to detect the junction between the parts of the various negatives employed. There is brilliancy and sharpness of rendering where such qualities are called for both by art and by common sense—as, for instance, in the eyebrows, eyelids, lashes, beard, and other parts upon which the attention of the spectator would naturally be concentrated — yet there are absolutely no "cruel cutting" outlines, which, on the contrary, are all softened and toned down to a most pleasing extent; while the folds of the cloth on which the head lies, and the vacant space above, without being in the slightest degree hazy or indistinct, are charmingly mellowed to a very unobstrusive reality, exhibiting aërial perspective in a pre-eminent extent. There is nothing like spottiness, no "impertinent" high lights, and the shadows are rich and transparent as shadows ought to be.

So much for manipulation: now as regards conception of the subject. In this there is much to commend—there is little, very little to which to object. A hypercritic might say that the features scarcely present the aspect of those of a Jew, though it would be difficult to prove that they were not so. The expression is one of calm placidity, devoid of all suffering, and indicative of a mind at perfect peace, before departure from its earthly tabernacle. The features are noble and intellectual in character, denoting a soul capable of great deeds and strong endurance—one that would regard the executioner with his sword to summon him from this world with as much calmness as if he were the bearer only of a summons to attend in the next room. It is the dignity of martyrdom which rests unsullied on the brow, in spite of the heedless defilement of the fingers of the headsman as he grasped the curls above the forehead to aid him in lifting the head into the vessel, where it now reposes in majestic quietude. It is truly a study for a painter!

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 9.

It will be remembered that, in a paper which we had the honour to read at the April meeting of the Blackheath Photographic Society, there appeared a table of composition of various mixtures of nitrosulphuric acid, of which a reprint is given below:—

COMPOSITION, BY VOLUME, OF NITROSULPHURIC ACID FOR PREPARING PHOTOGRAPHIC PYROXYLINE.

	Oil of Vitriol, 1·845 at 60 F.	Pure Nitric Acid, 1·45 at 60 F.	Water.
No. 1 ...	3 ...	1 ...	$\frac{7}{8}$
No. 2 ...	2 ...	1 ...	$\frac{5}{8}$
No. 3 ...	1 ...	1 ...	$\frac{5}{16}$
No. 4 ...	1 ...	2 ...	$\frac{5}{32}$
No. 5 ...	1 ...	3 ...	0

It was affirmed that each of the five mixtures imparted to immersed cotton nearly the same per centage amount of peroxide of nitrogen, but that nevertheless the properties of the resulting collodions were widely different. Few, perhaps, would have been at the pains of verifying such a table, and it might have remained in the pages of the Journal for a long time unquestioned. Nevertheless, as the theory rests partly upon its correctness, it seemed desirable to place it in the hands of a chemist experienced in the examination of nitrosulphuric acid and of gun cotton. We there-

fore prepared the mixture No. 1 at the top of the scale, and also No. 5 at the bottom, and submitted them to Mr. Hadow, whose researches on this subject are well known. Before giving the results it may be well to mention the course of proceeding which that gentleman adopts in such analyses. The cotton is first dried by enclosing it in a glass tube through which air heated to 212° F. is transmitted: it is then allowed to become cold, and weighed whilst still in the tube, to avoid any absorption of atmospheric moisture. The acid to be examined is placed in a wide-mouthed stoppered bottle, and cooled down to the temperature of the surrounding air; after which the cotton is dropped loosely into it, and air bubbles, if present, are removed. At the expiration of twenty-four hours the pyroxyline is taken out of the acid, and washed upon a filter with distilled water until the washings cease to redden litmus paper; it is then dried, not by hot air as before, but *in vacuo* over sulphuric acid. The exact increase of weight having been ascertained by a delicate balance, there remains still one precaution to be taken. The acid may have acted slightly upon the fibre, and caused a loss from solution; therefore the pyroxyline must be brought back again to the condition of common cotton, and it must be noted whether the weight corresponds to the original weight. This operation is performed by digesting the pyroxyline for a short time in an alcoholic solution of sulphide of potassium, which removes the whole of the peroxide of nitrogen in the form of nitrite of potash, and leaves the fibre of the cotton in its original state.

The numbers obtained by Mr. Hadow, calculated as 100, were as follow:—

In mixture No. 1, 100 grains of cotton became 169·2 grains.
" " No. 5, 100 " " " 159 grains.

The pyroxyline from No. 1 was insoluble in glacial acetic acid, whilst that from No. 5, on the other hand, was easily soluble in the same reagent. Mr. Hadow therefore in his report stated it as his opinion that the mixtures were not of the same strength, but that No. 1 produced the compound which he terms compound B, standing next to gun-cotton, whilst No. 5 produced compound C, two steps removed from gun-cotton.

It thus appeared that a discrepancy existed between our own results and those of Mr. Hadow, for in the former the products were all soluble in glacial acetic acid. The gain in weight had also been different in the previous experiments, viz., about sixty per cent. in the case of No. 1, instead of sixty-nine per cent. This discrepancy, however, had been foreseen. Knowing that the cottons were to be left in the cold mixtures twenty-four hours instead of one hour, we had stated to Mr. Hadow, before he commenced his analysis, that probably he would obtain a higher substitution compound in the mixture No. 1 than in the mixture No. 5.

That the pyroxyline ordinarily made by the formula No. 1, which the Collodion Committee examined, is not the high compound nearly approaching to gun-cotton is certain; for, in testing it on many occasions, it has always been found soluble in glacial acetic acid, and also in boiling alcohol of ·805. The quantity of water also which is contained in the acid mixture No. 1 forbids the supposition of the highest compound being formed, for this water may be very materially reduced without rendering the pyroxyline insoluble in ether and alcohol. The mode in which the pyroxyline burns is another proof of the correctness of the above assertion, since we find that the pyroxyline from mixture No. 1 burns comparatively slowly, and is not at all explosive.

It may therefore be concluded beyond doubt that this first mixture, when employed in the ordinary manner, yields a rather low substitution body; and it remains to be explained how it happened that a higher compound, not acted upon by glacial acetic acid, could be prepared from it.

On taking fifty grains of dry cotton and immersing it at 60° F. in mixture No. 1 for a period of ten minutes, it was found to increase to seventy-five grains, but the product was very imperfectly acted upon by ether and alcohol, leaving behind fibres of unchanged cotton. A second portion of fifty grains, immersed for an hour, weighed afterwards eighty grains, and was dissolved by the ethereal mixture, with the exception of a few floating fibres: this pyroxyline liquified to a gummy mass under the action of acetic acid. In Mr. Hadow's experiment, after twenty-four hours' immersion, fifty grains became nearly eighty-five grains, and the product dissolved absolutely in ether and alcohol, but was unaffected by acetic acid. The foregoing facts seem to confirm the idea previously entertained, that when nitric acid is brought to bear upon cotton it acts by successive stages, forming, first the xyloidine, then the compound next above it, afterwards one still higher, until a point is reached beyond which the dilution of the acid forbids a further rise.

It will, perhaps, occur to the reader that if the observation above made be true it must apply to any mixture of nitrosulphuric acid, and therefore if twenty-four hours' immersion gave a higher compound than one hour's immersion in the case of mixture No. 1, it ought likewise to have produced a higher compound in the case of No. 5. On consideration, however, this argument does not appear to be sound; for, on comparing the two mixtures, we see that the proportion of nitric acid constitutes scarcely more than one-fifth of the whole bulk of the mixture No. 1, whereas in the case of No. 5 three-fourths of the liquid consist of nitric acid. Now, in the ordinary way of preparing pyroxyline the cotton imbibes the liquid like a sponge, and that portion of the nitric acid which comes in contact with the fibre acts upon it and converts it into pyroxyline. The great bulk of the liquid, however, scarcely touches the cotton, unless it be left a long time in the acid and be well stirred about with a rod. The consequence of this imperfect diffusion must be that a short immersion cannot afford a true criterion of the actual strength of the mixture when the proportion of nitric acid is reduced below a certain point, and a weaker substitution compound than theory would indicate is produced in such a mixture, simply because the nitric acid, being small in quantity, is *exhausted* at the point where it touches the fibre. Hence we find practically in working by the formula now under discussion that it is difficult to obtain a product *entirely* soluble in ether and alcohol; and if we reduce the time of immersion from ten minutes to five minutes the amount of undissolved matter becomes greater. With a mixture containing equal bulks of sulphuric acid and nitric acid the pyroxyline is soluble in ether and alcohol without leaving any sediment, even when the amount of water in the acids is carried far enough to produce a partially opaque film of xyloidine.

We are still of opinion that the table of acids before given is correct in all cases when the pyroxyline is made by a short immersion; but the experiments of Mr. Hadow, taken in conjunction with our own, appear to show that two different substitution bodies may be made in the same acid by varying the time of immersion.

ON THE PREPARATION AND MANAGEMENT OF THE NITRATE BATH.

By N. Gordon.

Prepare with fused nitrate of silver, in preference to crystallised, as it gives better density than the other. Saturate with iodide of silver.

In travelling the bath occasionally becomes acid, in which case it is a good plan to have ready collodion iodised with magnesium: use this in preference to neutralising the bath with carbonate of soda, as it would then require filtering. By the course I recommend you avoid this waste of time, as with a bath holding a large quantity it is impossible to draw it off, and filter, without carrying with you a large bottle, syphon, &c., for this purpose.

It is of course the best plan to get the proper density for printing, if possible; but I find that, in so doing, the details are often so overloaded with silver that the negative takes a very long time to print, and the proper contrast between the lights and shadows is lost. My plan is, after I see all the details of the picture are *well* out, to run the developer once over the negative again, then wash and fix.

When I require to print from a negative without the proper density, I put it against a window, leaning it on the edge of the sash, and taking a piece of thin blotting paper, I draw a line with a pencil over the outline of the picture, cut it out, then put the negative into the pressure frame, and the paper with the sky outline *over the outside glass* of the pressure frame. By this means you get clean skies, without any touching or painting the negative itself.

As an iron developer, I use the saccharo-sulphate: it developes more evenly than protosulphate, and, from the organic matter contained, gives greater density; it can also be kept longer on the plate, as the nitrate of silver is decomposed by it much less rapidly than with the protosulphate. As to paper, about which so many complaints are made, I recommend a trial of Mr. Hughes's, of Oxford Street.

ON THE ENLARGEMENT OF NEGATIVES.

By M. Bertsch.

In the enlargement of the negative (for which I am indebted to the kindness of M. Ferrier) I have been limited neither by the want of sharpness in the image nor by the fear of fringes of diffraction, but solely by the dimensions of the glass and by the distance at

my disposal. In the same manner as with my microscopical proofs, I have made use of parallel rays of light, and the apparatus the construction of which I explained at one of our former meetings.

Experience taught me long ago that, with the proper conditions of light which I adopt, the enlargement has no other limits than the appearance of the molecular arrangement of the substance used for the support of the small negative. When the light is quite parallel there is, consequently, no possibility of any refraction by the glass supporting the negative,—we only begin to see the structure of the film on an amplification of 2500 superficial dimensions for collodion, and 6400 dimensions for albumen.

In order to obtain the sharp appearance which is to be discerned in this proof, it is necessary to act in the shortest possible time (the one before us was only exposed a quarter of a second). This is required on account of the shaking occasioned by the traffic in the streets, and particularly on account of the progression of the sun. On the least advance of the latter, the axis of the rays ceases to be perpendicular on the posterior face of the negative, refraction is perceived, and the image on the screen displaced. It is on this account that I have always protested against the mode of illuminating at present in use; for, even without the movement of the sun, it causes unequal refractions from the centre to the circumference, and has, consequently, the effect of spoiling the image by producing multitudinous outlines of the object.

I beg to add that, even with the most favourable circumstances of which we can avail ourselves, it will be impossible, with substances of little sensibility, to obtain a sharp proof without the use of a heliostat, which exactly maintains the rays in the axis of the optical system.

If the proofs presented by M. Delessert (although possessing powerful artistic effect) are not quite sharp, it is neither to the imperfection of the negative nor to the aberration of the lens, and still less to the artist's want of precaution, that this fault must be attributed, but to the length of the time of exposure, and to the incomplete construction of the apparatus of which our clever colleague has made use.

In employing paper, prepared with chloride of silver (which at the end of twenty minutes is not sufficiently affected), it will be absolutely necessary to make use of the heliostat. A cross of platina wires fixed at the principal focus of the lens, and kept, during the time of exposure, in constant superposition on a similar cross placed at the summit of the outer cone, will answer the purpose; but this requires great patience on the part of the operator, and a perfect precision in all his movements.

Damp negative paper, such as is prepared at the present day, possesses sufficient rapidity for giving excellent proofs, and, by gold toning, will produce very harmonious shades.

People are greatly mistaken if they think that the enlargement of photographic negatives is but simple play-work, or a curious experiment of the laboratory. On the contrary, it merits the serious attention of the Society; for, according to my opinion, it will powerfully affect the future of our art, and is destined to greatly extend its practice, as well as to render certain very remarkable results.

If, by applying the processes of enlargement to the study of natural history with the microscope, I have been enabled to reproduce, with considerable dimensions, invisible beings, the infinite details of which would dishearten the most clever engraver—if they have further enabled me to solve some questions of physiology greatly interesting to science, I have not the least doubt that, when transferred to the domain of art, they will become of great assistance and very useful.

I have already addressed you on this subject several times, and have likewise opposed certain errors: my reason for doing so is, that, having had ten years' experience, I am enabled to trace a safer road to beginners than they have hitherto found.

Let us therefore communicate our discoveries and ideas to each other, and we shall not fail to cause the Science of Photography, so useful to every art, to be more generally applied.

The stereoscopic proofs, which one of our colleagues, M. Ferrier, has brought to so high a degree of perfection, have naturally suggested the idea of enlarging them, whilst, at the same time, we preserve their great sharpness.

In carefully studying the effects of the instrument which produces their relief, I have acquired the conviction that the theory of Sir David Brewster, although the only one that is admissible, does not give sufficient reasons for this phenomenon. I therefore beg leave to complete it by a remark which, moreover, greatly concerns the question of enlargement.

Artists particularly find fault with our photographic proofs on account of their being deficient in aërial perspective; and they are right. Several photographers have attributed this fault to the sensitive surfaces which, they say, are proportionally more affected by the light of the foreground than by that of the more distant parts. But, in my opinion, they are wrong; for the remotest part of the landscape sending even to our eye a greater amount of light than the foreground, the glass reproduces only the same scale of the luminous intensities which exists in nature, and can therefore not be made responsible for this want of harmony.

Others have pretended that the great sharpness of the horizon makes us bad judges of depth, when drawing conclusions as to distance; but far-sighted persons see the background of a landscape as clearly as the camera can produce it, and this is in no way injurious to the idea of distance. The reason for this want of harmony must therefore be sought elsewhere. You must have remarked that the larger the proofs are the greater is the defect in the perspective. Well, the chemical processes being the same for the large proofs as for small ones, it is to the optical arrangements that this fault must be attributed. We may remark that the more extended a proof is the more it will fall short in the foreground on account of the exigencies of the optical laws. Consequently, the sensation of extension is determined for us by the dimensions, the details, and the sharpness of the *foreground.* Isolated from it we can form no idea of distance.

The lenses which produce images of seventeen inches in diameter have a focus of at least thirty-nine inches, so that for them infinity, that is to say, the limit of sharpness most attainable, can hardly commence at a less distance than four or five hundred yards. All that is nearer is not strictly in focus, and must almost be entirely suppressed in the proof. *Our* distinct view, on the contrary, beginning at a very small distance from our eye, you will easily understand why there can be no comparison between a landscape as rendered by the camera and the same as we see it in nature. It is this variance which produces the deficient perspective in photographs. When we distinctly perceive objects which are near us, and which stand in the foreground, we can appreciate their real dimensions; and it is only by comparing their dimensions with that of similar or analogous objects, standing in different planes and continually decreasing in size, that we obtain the sensation of depth. This is so true that artists, painting panoramas, will never fail to place some living object on the canvas before the eyes of the spectator, in order that he may feel and understand distance, by instinctively comparing the dimensions of the real object with those of the objects painted.

For example: the angle of vision subtended by a house which, at a distance of about 300 yards, stands in the foreground, and the angle which embraces a house which we may suppose to be nearly similar in size, but which is situated near the horizon, are not sufficiently different to give us a clear idea of depth. The comparison of our best process with a Canaletti, for instance, will be quite sufficient to prove the truth of my statement. You will see, without the necessity of any further remarks, that the marvellous effect of the stereoscope is partly due to the more natural proportion existing between the fore and the background of the proofs, a proportion preserved in the amplification which the instrument causes them to undergo; and you will perceive of what an immense advantage it will be if for landscapes we make use of lenses the distinct view of which, if I may be allowed to make use of the expression, commences very near to our eye, that is to say, with lenses of short focus. You will likewise understand why I say that the effect of the stereoscope is not wholly due to the somewhat different angles under which we perceive the two images, but also to the relatively nearer situation of the foreground, which, when these images are a little enlarged, will produce in our eyes the same sensation as that which they receive from nature itself. In order to heighten the artistic effect and the appearance of truth, it will therefore be necessary to take our negatives with lenses of short focus, and afterwards enlarge them considerably. The greater the difference in size between the negative and the proof, the more we shall perceive the aërial perspective. With a view to solving this interesting problem for as many people as possible, I am at present constructing a camera for the use of travellers, which I will exhibit at our next meeting.

Not wishing to take up your time unnecessarily, I will only state, on the present occasion, that this camera, being regulated by micrometrical arrangements, will, in the hands of the operator, be like a veritable eye, the distinct view of which begins at the distance of a few yards; that the size of it will be about three inches;

that it will produce images mathematically, in the focus for all planes on a surface of two and one-third inches square; and that to make use of it it will not be necessary to possess much knowledge either of optics or of photography. Painters and tourists will thus be enabled to bring back from their travels any object from which they can retire a few steps only, and this without being encumbered by any luggage, without soiling their fingers with our materials, nay, even without looking into the little chamber.

THE SOLAR ECLIPSE.

[THE interest attaching to the total eclipse of the sun on the 18th ult. is still undiminished; and therefore no apology is needed for presenting to our readers, *in extenso*, the following lengthy but important letter, written to *The Times*, by Mr. E. J. Lowe, the eminent astronomer, one of the scientific gentlemen who accompanied the Astronomer Royal to Spain.—ED.]

SIR,—A total eclipse of the sun is a phenomenon which attracts universal attention, and being of rare occurrence, and more especially so in any particular spot, when such an eclipse does take place an excitement is caused so great that it takes precedence in the minds of men over everything else, for that day at least. It will therefore, doubtless, interest your readers to hear something regarding the great eclipse of the 18th of July.

Before describing this particular eclipse, allow me to say a few words on eclipses in general. In the present age, unlike olden times (when a superstitious dread filled the minds of men on such occasions), we all know more or less about eclipses; we have learnt that a solar eclipse is nothing more nor less than the body of the moon passing between us and the sun, and that a lunar eclipse is caused by the earth passing between the sun and the moon, and thus preventing the sun shining upon it, or, in other words, the earth casts a shadow upon the moon, and this shadow is the darkness which we see upon the moon in a lunar eclipse. Perhaps, however, it is not universally known that the same eclipses recur every 18 years and ten and a half days. These eclipses will differ in magnitude, and they will occur more or less irregularly. Seventy eclipses usually take place during the 18 years, those of the sun being 41, and those of the moon 29. Reading this in an astronomical work, the public naturally conclude that solar eclipses are common; but on account of the moon's body being smaller than that of the sun, her shadow is a cone, tapering to a point, and as the distance between the earth and moon slightly varies, it happens that this point of the moon's conical shadow sometimes does, and sometimes does not, reach the earth, and when it does its dimensions are inconsiderable. Consequently, a total eclipse is a rare phenomenon, and, further, being limited in extent, it is even more rare at any one locality. The immortal Halley, in describing the total eclipse of the sun in London of the 3rd of May, 1715, remarked that previously none had been total in London since March 20, 1140, a period of nearly 600 years. To take an example of the recurring period of 18 years, by comparing the year 1842 with the present year 1860, we have the following eclipses recurring:—An annular solar eclipse, 1842, January 11, and 1860, January 22; a partial lunar eclipse, 1842, January 26, and 1860, February 6; a total solar eclipse, 1842, July 7, and 1860, July 18; a partial lunar eclipse, 1842, July 21, and 1860, August 1; an annular solar eclipse, 1842, December 31, and 1861, January 10.

The period of totality of a solar eclipse can never exceed 7m. 58s. under the equator, and not above 6m. in this island, so that even when we are fortunate enough to witness a total eclipse of the sun, its duration is necessarily very short, and consequently phenomena of a wonderful character are so crowded together that before there is time to make a proper record daylight has returned, and shut out these singular appearances. Indeed, the sights to be seen during these brief minutes are of so imposing a nature that it is only the steady astronomer who can look and record what he sees, for on no occasion is the motto of the Royal Astronomical Society (*"Quidquid nitit notandum"*) more difficult to be obeyed than during a total solar eclipse.

Returning to the present eclipse, the line of totality enters North America from the Pacific Ocean at Astoria, in Oregon, passes across North America to Cape Chudleigh, in Labrador, and across the North Atlantic Ocean (the line lying to the south of Greenland), enters Spain about Gijon, Santander, and Bilbao, crosses Reynosa, Arnedo, Calatayud, Daroca, Montalvan, Morella, and Oropesa, enters the Mediterranean, crosses the Island of Ivica, and grazes the south edge of Majorca, passes into Algeria, and ends near the Red Sea. The breadth of the line of totality is great; the southern limit in Spain extends considerably beyond Oviedo and Valencia, while the northern limit extends beyond Tortosa and nearly reaches Pampeluna.

Previous to describing the expedition and the observations made in Spain, it will be necessary to say a few words regarding the instruments. My own department was meteorology, and the making of the whole of the instruments was intrusted to the care of Messrs. Negretti and Zambra, opticians, Hatton Garden; and I must add that my confidence with regard to the skill of this well-known firm was not misplaced. These instruments consist of a standard barometer, patent *maximum* and *minimum* thermometers placed at one, two, three, and four feet above the ground, both in sunshine and shade, self-registering *maximum* and *minimum* wet and dry bulb thermometers, vacuum thermometers, thermometers made expressly for plunging various depths into the ground, and a series of blackened bulb thermometers; a Robinson's anemometer, to show the velocity in miles of the movement of the air, and a Lowe's ozone box—the wind vane being a light silk flag. These instruments were read off, as previously arranged, every five minutes, from twelve o'clock till five o'clock, by myself and the Rev. W. R. Almond, F.R.A.S., and Mr. Samuel Morley, my assistants, accurate time being kept by a most excellent duplex watch, made by Mr. J. Bennett, of Cheapside—a maker whose watches I have used with satisfaction for some years. The thermometers were placed on a Lawson thermometer stand, made portable for this expedition. For photographic observations, salted papers (sensitised before leaving England) were conveyed in the patent preservative case of M. Marion, of Regent Street, and were exposed constantly during the progress of the eclipse. Besides these, the variously-prepared dry plates (*i. e.*, collodio-albumen, metagelatine, Fothergill's, and those of the Birmingham Dry Plate Company) were taken out for exposure in the stereoscopic camera known as Dancer's patent. These dry plates will be interesting in more ways than one, as they will be the means of recording pictorially the place of observation and places of interest passed over by the present expedition.

It will be necessary to add that the observers were distributed in various directions. A large portion which landed at Bilbao, including the Astronomer Royal, have not as yet been heard of since the eclipse. Those observers who landed at Santander took up positions—some at Santander, others at Alar del Rey; Mr. Lassell at Aguilar de Campo; the Swedish astronomers at Escudo Pass; Professor Swann, Mr. Ellis, and myself, at Fuente del Mar; Mr. Heath at Pena Castilla; Mr. J. Mould at Los Corrales; and a staff of observers, under Captain Seccombe, opposite the anchorage of the Himalaya. At Fuente del Mar, the beginning of the eclipse was well seen. Exactly one minute before totality clouds hid the sun, and the celestial phenomena were lost; but, owing to large spaces of clear sky, the terrestrial phenomena were grandly visible, and our whole attention was riveted upon them. Fortunately, a mile from here the observers at the Himalaya had a fine view of totality, stars became visible, together with the red prominences and corona.

The following is a record of the readings of the different instruments, and, as they are taken from above 4000 observations, made by myself and assistants during five hours, they must prove of great value. Commencing with underground temperature, a thermometer placed 6 inches below the surface of the ground ranged between 67·9 deg. and 70·7 deg.—*i.e.*, 2·8 deg.; at this depth the eclipse was not sensibly felt, whereas other thermometers, placed 4 inches, 2 inches, 1 inch, and half an inch below the surface, all exhibited in a very marked manner the effect of the eclipse. On the grass the temperature fell to 64 deg. at 3h. 5m.; at half-an-inch below the surface to 69 deg. at 3h. 15m.; at 1 inch deep to 69·5 deg. at 3h. 15m.; at 2 inches to 71 deg. at 3h. 55m.; and at 4 inches to 70·7 deg. at 4h. 30m. p.m.

The temperature on grass was 77·5 deg. at noon, rising to 91·7 at 1h. 50m., and then falling till 3h. 5m., and again rising to 85 deg. at 4h. 10m., giving a range of 27·7 deg. At half an inch below the surface of the ground the temperature rose till 1h. 55m. p.m., when it was 78.5 deg., and then gradually fell to 69 deg. at 3h. 15m., rising again to 74·7 deg. at 4h. 30m. p.m., the range being 9·5 deg. At 1 inch below the surface, the temperature rose till 1h. 55m. to 76·2 deg., fell till 3h. 25m. to 69·5 deg., and rose till 4h. 55m. to 74·7 deg., the range being 6·7 deg.; at 2 inches below the surface the temperature rose till 2h. 5m.—viz., to 74·4 deg., then fell till 3h. 55m. to 71·0 deg.; and afterwards rose till 4h. 55m. to 73·7 deg., the range being 3·4 deg., and at 4 inches below the surface the temperature rose till 2h. 50m. to 73 deg., then fell till 4h. 30m. to 70·7 deg., and again rose till 6 p.m. to 73·2 deg., the range being 2·5 deg.

The greatest cold on the ground occurred between 3h. and 3h. 5m. p.m.; ditto, half-inch below surface, 3h. 10m. and 3h. 15m. p.m.; ditto, 1 inch, 3h. 20m. and 3h. 25m. p.m.; ditto, 2 inches, 3h. 50m. and 3h. 55m. p.m.; ditto, 4 inches, 4h. 25m. and 4h. 30m. p.m.

Temperature.	Commencement of Eclipse.	Middle of Eclipse.	End of Eclipse.	Range during Eclipse.
	Deg.	Deg.	Deg.	Deg.
Of a blackened ball on grass	104·0	65·5	94·0	38·5
Of a blackened ball in vacuo	131·0	66·0	104·0	65·0
In sunshine at 2 feet	75·5	63·6	70·0	11·9
In sunshine at 2 feet, wet bulb	69·5	59·3	65·5	10·2
Difference between dry and wet bulb at 2 feet	6·0	4·4	4·5	1·6
In shade at 4 feet	70·0	64·7	71·0	6·3
In shade at 4 feet, wet bulb	62·5	59·7	63·5	3·8
In shade at 3 feet	70·2	64·2	70·7	6·5
In shade at 2 feet	68·5	62·5	68·5	6·0
In shade at 1 foot	70·7	64·5	70·2	5·7

The barometer rose from 1h. 40m. till 2h. 10m. 0·002 inch, then fell till 3h. 5m. 0·017 inch, and rose till end of eclipse 0·009 inch.

Intensity of photographic light from salted papers conveyed sensitised in Marion's dark box, exposed for 10 seconds (with a scale of 0 to 5 deg.), at the commencement of the eclipse, $4\frac{1}{4}$ deg., becoming 4 deg. at 2h. 5m., 3 deg. at 2h. 15m., 2 deg. at 2h. 25m., 1 deg. at 2h. 40m., $0\frac{3}{4}$ deg. at 2h. 50m., 1 deg. at 2h. 55m. (clear about sun), $0\frac{1}{4}$ deg. at 3h., 1 deg. at 3h. 5m., 2 deg. at 3h. 25m., $2\frac{1}{2}$ deg. at 3h. 40m., 3 deg. at 3h. 50m., and 4 deg. at 4h. During totality a paper exposed for one minute gave $0\frac{3}{4}$ deg.

The wind was N.W. and N.N.W. till 4h. 20m., then W.S.W., becoming S.W. at 4h. 25m., and S. at 4h. 45m. The wind was brisk at the commencement of the eclipse, quite a calm during totality, and a gentle breeze afterwards. The distant prospect was very clear, except during totality, when the mountains disappeared and only near objects were visible.

The clouds, which were chiefly cumuli, diminished in amount till 1h. 50m., when only four-tenths of the sky was overcast, then increased till 2h. 35m., with much cloud till 3h. 55m., then again diminished to six-tenths at the termination of the eclipse, the range being 5·5 tenths of the whole sky. Towards totality some of the cumuli became scud, which lasted from 2h. 5m. till 3h. 10m., giving the strongest impression that the change was due to the eclipse.

The morning was fine, and from 12h. 45m. p.m. sunshine; at 1h. 25m. much open sky about the zenith, 2h. 15m. a blackness about W. horizon, and slightly so in N. and S., at 2h. 30m. the hills dark, and the blue sky in N. and E. very pale in colour; 2h. 35m., hills dark, with a blue haze among the more distant mountains; 2h. 40m., horizon due W. pink; 2h. 45m., clear sky in N., pink; 2h. 52m., splendid pink on W. horizon, warm purple on summits of mountains in S., clear sky; in N. deep lilac, and in E. very pale blue; 2h. 57m., rapid change, the clear sky in N. deep marine blue with a red tint.

Before totality commenced the colours in the sky and on the hills were magnificent beyond all description; the clear sky in N. assumed a deep indigo colour, while in W. the horizon was pitch-black (like night). In the E. the clear sky was very pale blue, with orange and red like sunrise, and the hills in S. were very red; on the shadow sweeping across, the deep blue in N. changed like magic to pale sunrise tints of orange and red, while the sunrise appearance in E. had changed to indigo. The colours increased in brilliancy near the horizon, overhead the sky was leaden. Some white houses at a little distance were brought nearer, and assumed a warm yellow tint; the darkness was great; thermometers could not be read. The countenances of men were of a livid pink. The Spaniards lay down, and their children screamed with fear; fowls hastened to roost, ducks clustered together, pigeons dashed against the sides of the houses, flowers closed (Hibiscus Africanus as early as 2h. 5m.); at 2h. 52m. cocks began to crow (ceasing at 2h. 57m., and recommencing at 3h. 5m.). As darkness came on many butterflies which were seen about flew as if drunk, and at last disappeared; the air became very humid, so much so that the grass felt to one of the observers as if recently rained upon. So many facts have been noticed and recorded, that it is impossible to do more than give a brief statement of the leading features. At 5h. 55m. a mock sun was formed 22 deg. below the true sun, having the ordinary circular form. From the summit of Pena Castilla, overlooking the Bay of Biscay, Mr. Heath noticed the magnificence of the colouring of the sky reflected in the sea, while the water near us was of a deep leaden hue, owing to clouds overhead.

I am indebted to Mr. Thompson, master of Her Majesty's ship Himalaya, for the following telescopic observations:—

Totality commenced at 2h. 52m. 55s., when prominences were visible, one on the west and two on the east, of a bright lurid lake colour, followed by the corona shooting out on the east of the sun in two forked tongues. The colour of the corona was white darting outwards. Towards the end of totality another prominence was noticed on the west side of the sun, of the same colour as those first seen; and below this a most beautiful collection, as of golden beads closely strung together, shone out, extending to the lowest part of the western limit of the sun. The stars numbered 7 and 8 in Mr. Hind's map were distinctly visible in the telescope. The cusps of the sun were rounded before and after totality, and the prominences were lurid and well defined. A very considerable variation of the compass took place during the eclipse.

Lieutenant N. C. Barton, of the same ship, has kindly communicated a few of the notes made by him during the eclipse Venus appeared shining very brightly in the midst of the totality at 2h. 59m. 56s. Pollux also was seen at 3h. 0m. 24s., but was only in sight four or five seconds, in consequence of a cloud overcasting it. Three red protuberances showed during totality to the left of the sun, the upper one being very bright. Some beads were also observed, of a light, shining character—very like a diamond necklace worn by a negro belle.

At Los Corrales, Mr. J. Mould remarked that the blue sky over Santander appeared a very dark indigo, afterwards changing to a deep amber, and was most beautiful; that his fowls began to march "*a cama*," but, light coming on, they returned to their usual occupation. The temperature in sun ranged on the grass between 109 deg. and 62 deg Before totality the sky became overcast

Before I conclude this letter, written from an arbour in the pleasant grounds of Mr. J. P. Sewell, managing representative of Mr. Mould, overlooking Santander harbour, where rides the magnificent Himalaya, it becomes me, in the name of the party to which I am attached, to return our most grateful thanks, not only to Mr. Sewell for his generous

hospitality, extending over a whole fortnight, and for the facilities which, from his high position, he has been able to afford us in the pursuit of our aims, but also to Lieutenant March, the British Vice-Consul, to the authorities of the port, and to the inhabitants, who have received us with a cordiality and urbanity which has been highly gratifying. It may be recorded, as perhaps a valuable hint to the managers of our own companies, that, immediately on our arrival, free passes were sent by the railway directors, not only to the astronomers, but to all the officers of the ship, enabling us and them to travel wherever we liked upon the Ferro-Carril de Isabel II. between Santander and Alar, with this liberal endorsement, "*Durante su permanencia en Espana*," a boon of which I need scarcely say we have taken every advantage. To all the staff on the line our thanks are due for the unbounded trouble which they have taken in furthering our endeavours to fix upon eligible sites for observation, and in facilitating our general arrangements.

I have the honour to be, sir, your obedient servant,

E. J. LOWE.

Fuente del Mar, near Santander, North Spain, July 19.

MESSRS. SPILLER AND CROOKES' EXPERIMENTS.

MESSRS. SPILLER and CROOKES having determined to co-operate in obtaining photographs of the different phases of the solar eclipse, commenced their arrangements in the grounds of the Royal Arsenal at Woolwich, at an early hour on the morning of Wednesday, the 18th ult. The apparatus employed was the small equatorial belonging to the Military Repository, which has an object glass of four inches diameter, having a focus of six feet, and was mounted on a stand with screw adjustments for altitude and azimuth; the eye-piece was removed and a quarter-plate camera attached to its tube. After various trials, it was found necessary to reduce the aperture, by means of card diaphragms, to one-fourth part of an inch, and to give exposures of only $\frac{1}{1000}$ part of a second before perfect pictures could be obtained. That no delay might arise in the operations, all the apparatus, baths, &c., were arranged in duplicate, in a manipulating room, well lighted by means of yellow glass windows. Mr. Spiller gave his attention to the adjustment of the camera and frame; Mr. Crookes to the exposure of the plate. At the moment of first contact, the phenomenon was obscured by a passing cloud; but in a few minutes it was revealed to view, with decided evidences of the eclipse having commenced, and from this point to its termination plates were exposed about every five minutes. One of the most successful of this series was obtained at 2h. 48m., that being the moment of greatest obscuration, and represents the sun as *a sharp* crescent, the edge presenting a marked contrast with the serrated mountainous edge of the moon then creeping over its surface. About this period these gentlemen noticed a curious phenomenon. Spots of sunshine, falling through the foliage, usually present a circular form in the shade beneath, being in fact minute images of the sun; but they observed that the ground beneath some trees near them was studded with small *crescent-shaped* images of the eclipsed luminary, and surrounding objects were illuminated with an unearthly, ghastly yellow gleam, quite of an unusual character.

OUR EYE-WITNESS AT OXFORD.

As we have been called upon to fix our ideas of the British Association Meeting at Oxford, from a photographic point of view, we suppose it is incumbent upon us to try to fulfil that task; though we must confess that their development has not come out at all strongly; and, as we are sure that we focussed correctly, and exposed no less than the entire time of the meeting, we must lay the fault upon the absence of actinic influence in the matter before the meeting—which, considering the *locale*, seems strange.

We wish we had been in a position to do justice to the *embarras de richesse* which here presents itself to a photographer in search of a subject. He may gratify his taste whether his aspirations lead him in an architectural, archeological, antiquarian, sylvan, or domestic direction. He may fill his plate-box with Guy Faux lanthorns, prescriptions by Old Radcliffe, autographs of Calvin, Luther, or the skeleton of the great tunny fish sent to Dr. Ackland from Madeira, and which stands so conspicuously in the great quad. of the Museum, a natural prototype of the skeleton glass cases around it. The weather was not very propitious during the early part of the meeting, or we know not how many of these subjects we might have taken off; as it is, we have secured, with Dr. Norris's aid, only a few views of the interior of the Museum—that fairy-like structure which was deservedly the cynosure of all its visitants. We spent three or four pleasant evenings there; and you, too, Mr. Editor, will not cavil at our appreciation of the rich treat afforded us by the inspection of some two hundred and fifty microscopes, with the varied objects on their stages. These were not so rare as rich; but it is an interesting sight to watch an assembly of this kind intent upon such an amusement. Young and old, thoughtless and grave, dignitaries and humble, all bend alike to the magic glass which reveals so much of the inner world in and around about us; and even the poor frog, whose circulation is exhibited to the pleasure of hundreds, but to its own pain, becomes quite a curiosity for the nonce. But we prefer Messrs. Smith, Beck, and Beck's preparations, or Mr. Thomas's instruments, under which are shown the circulation in plants, also various *rotiferæ volvoces*, &c. A binocular microscope attracted our attention also, and most of all, some decomposed glass, from Nineveh, &c., exhibiting all the colours usually displayed by polarised light. This was shown by Sir David Brewster, a veteran whom we were delighted to meet once more, apparently in vigorous health;—long may he live to enjoy the honours of a hale old age! Then there were photographs by Hill, of Cornmarket Street, Oxford, of various portions of the interior of the building, principally capitals and spandrils. If Mr. Hill could be induced to publish these at a cheap rate, we should commend them to every mason who desires to raise himself above the level of his craft, and emulate the brothers O'Shea, whose hands have been so active in this really beautiful building. Then there were Mr. Fenton's (we beg his pardon, Captain Fenton's) views of the exterior of the building; and we heard stories of his travelling apparatus, and of his horse, whose immovability must be a special development adapted to the photographic propensities of his master. Professor Hochstetter exhibited some photographs from New Zealand, the names of which we cannot recall to mind at all—chiefly scenery of a not very interesting character, and but indifferent specimens of photography. When we have referred to the electrical experiments by Mr. Ladd, we have exhausted all that need be said of the *soirées* of this meeting, which were brilliant in point of place and company, but rather deficient in regard to scientific attractions.

We attended Professor Walker's Discourse on the Sun, a paper which, of course, opens upon an immense field of controversy; but we gathered from it that, as far as doctors are *agreed* on the subject, there is a long extended future for photographers, and that solar influences will continue to abound with sustained if not increasing actinic power.

Captain Osborn's attractive lecture on Arctic Discovery, and the recital of the Franklin Prize Poem, and the Conferring of the Degrees, did not reveal any photographic mysteries to us, but we rejoiced to assist at the ceremony which dignified the three *literati* whose names are household words—Wrottesley, De La Rive, Sedgwick, form a triumvirate of *savants* long to be held in honourable remembrance. Of course we wandered over the courts and quads. of the University, seeing (with regret that we could not take all of them home with us) many characteristic bits extremely worthy as objects for the camera:—the beautiful gates of St. Mary's—the fine entrance to the Hall at Oriel—the Statue in Brazennose Quad.—the Cathedral—the Tower and Bridge at Magdalen—the magnificent avenue at Christ Church—the University Boat Club Barge, &c., being among these.

Then we followed the Oxford City Rifles to their drill-ground. We wonder if it has occurred to any one to test invisibility by the effect produced by a body of men in the camera: it would be the *experimentum crucis* in this direction. We never yet saw any Volunteers whose dress came up to our idea of indistinctness; certainly the Oxonians have not attained this. The members of their band exhibit the extremes of conspicuosity, with their scarlet peg tops and plumes; but then bands would not be permitted on the field.

We must not omit to mention that we included a trip to Banbury in our photographic ramble. The good people of Caketown have, in their desire to keep up the remembrance of the good old times, erected a cross, to which the Oddfellows made a pilgrimage on the 3rd of July, and the Lady with "rings on her fingers and bells on her toes" was also duly personified.

We also remember our trip to Blenheim, and long for another opportunity of visiting it with our camera. For forest scenery we think this fine place can hardly be exceeded; and as trees are somewhat difficult to manage, we recommend our friends to try their hands there.

We had got thus far with our paper when we received yours of the 15th ult., in which you have really exhausted the photographic business of the Association, which certainly was very meagre, and especially so remembering what Professor Owen said at Leeds, from which we should have hoped better things: as it was, photography was chiefly conspicuous by its absence. Perhaps Mr. Darwin's theory of natural selection had something to do with this. We feel satisfied our Manchester friends will do their best to wipe away the reproach which seems to attach to photographers in general. Their vocation, being essentially peripatetic, should receive due notice in the proceedings of a body so peripatetic as the British Association.

Altogether we shall bear pleasantly in mind our Oxford excursion. If it was not productive of much practical photographic good, it wrought some benefit in making us several new friends, and helping to that reinvigoration of body of which we stand much in need at times. Σ

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.

Report of the Committee, consisting of Messrs. MASKELYNE, HADOW, HARDWICH, *and* LLEWELYN.

(Continued from page 207.)

THE processes which seemed to hold out the greatest prospect of success for the production in the first place of a suboxide, and subsequently of a sub-chloride, by the methods of the laboratory, and independently of the action of the light, were those afforded by the reduction* of the citrate of silver, and by the conversion of arsenite of silver† by the action of a caustic alkali into alkaline arseniate, accompanied by a reduction of the oxide of silver to a mixture of metallic silver and suboxide, thus:—

$$3\ AgO\ AsO_3 + 3NaO\ HO = 3\ Na\ O\ AsO_5 + Ag_2\ O + Ag.\ ‡$$

Of the results yielded by the first of these, none were found that gave any promise at all satisfactory. Hydrogen was passed through citrate of silver suspended in hot water. The products, at first brown, and then black, and finally grey, were examined at various stages of their progress in coloration, citric acid being used as a solvent to remove the citrate and the oxide,§ the residuary product being examined by treatment with dilute chlorhydric acid to convert it into chloride. The citric acid solution was found to contain nothing capable of reducing permanganate of potash, and must therefore have been free from suboxide. The result of treating the residue with chlorhydric acid, and then dissolving the silver by dilute nitric acid, was a rose-tinted chloride of silver.

On the supposition that this residue was a mixture of suboxide, or a salt of it, with metallic silver, we are constrained to the view that the suboxide of silver is not characterised by the property of entirely passing, under the influence of chlorhydric acid, into subchloride. This seems to be confirmed in some degree by the results with the arsenite, to which we now proceed. To that reaction, which Wöhler has described, much attention was devoted; and it was tried under several modifications.‖ By forming a dilute solution of arsenite of silver in nitric acid, and adding this very gradually to a boiling concentrated solution of soda, an extremely black powder was produced. This on being treated with dilute chlorhydric acid becomes grey; and on boiling the washed product with dilute nitric acid, silver is dissolved, and there is left a substance which, if Wöhler be right in calling the black powder suboxide of silver, we should expect to contain subchloride of silver. The colour of this substance is a rich chocolate or maroon, more or less dark, according to the nature of the process: it never reached the deep slate-violet of the chloride of silver exposed to sunlight.

* Wöhler, Ann. Pharm. xxx. 3.

† Wöhler, Ann. Chem. Pharm. cl. 363.

‡ The formula for arsenite of silver usually accepted is 2 AgO AsO_3, but we find Wohler's formula as above given to be the correct one.

§ The brown product became converted into the black one by the treatment with citric acid. Both underwent similar changes under the successive action of chlorhydric and nitric acids, and both previous to this treatment reduced the permanganate of potash powerfully. But it was found that the citric acid alone was capable of reducing the deposit to the grey condition of metallic silver, withdrawing from it at the same time (all the) oxide of silver,—a result which seemed to render almost hopeless the effort to form the suboxide by its means.

Indeed the mere boiling of the citrate blackened it, producing a dark-coloured mixture of silver with some compound of the suboxide, the citrate itself undergoing a transformation which must have lowered its saturating power, as the solution remained neutral. The citrate, however, when thus boiled with water through which a stream of hydrogen was passing, became more darkly coloured, but imparted an acid reaction to the water.

The black body that results from the reactions described, contains organic matter, as it intumesces when heated. It cannot therefore be merely a mixture of metallic silver with the suboxide.

The dry citrate heated in a stream of hydrogen is very slowly affected at 212°, but passes at length into a substance which produces on the one hand a dark-brown solution, and on the other a brown residue which yields a very pale-red body on being transformed by chlorhydric and nitric acids.

‖ It appeared, in trying Wöhler's experiment in several ways, that on the one hand it was extremely difficult to get rid of all the arsenic compound from the residue, and on the other that the tendency of arsenic acid in solution was to further the breaking up of the suboxide into oxide and metal. Lime and baryta-water were therefore substituted for the soda, but still arsenite of silver remained undecomposed. This seemed due to its solid condition. It was to overcome this that the solution in nitric acid was adopted.

It was found, however, that the chocolate-tinted compound of chlorine and silver, by whatever process it had been produced, became, by fresh treatment with chlorhydric acid, again capable of yielding a solution of silver when treated by nitric acid. So utterly unstable are these subcompounds of that metal!

Indeed it would seem that, to secure to them any permanence, they must be formed in combination.

On analysis it was found to contain as large an amount as twenty-four per cent. of chlorine;

The pure chloride Ag Cl contains 24·74 of chlorine;
The subchloride Ag_2Cl requires 14·08 of chlorine.

Other products of less-deep hue than the one first examined gave the numbers 24·3 and 24·2 per cent. of chloride. Assuming that the chocolate hue was imparted to the substance by a subchloride (and no other view seems equally probable), we are constrained to recognise in this subchloride, only present to the amount at the furthest of five per cent., a surprising colorific energy.

From the experiments previously cited, we are disposed to think that our failure in this attempt to produce the pure subchloride of silver arose from the fact of the action of chlorhydric acid upon the suboxide of silver not being so simple as a complete conversion into subchloride would indicate; and we are the more induced to draw this conclusion from the analogy of the suboxide of mercury. Thus, if from a solution of the suboxide of mercury that oxide be precipited, the action of chlorhydric acid on the precipitate is not to form the subchloride, but a grey mixture of chloride and metallic mercury. The same may perhaps apply to suboxide of silver; and, if so, it would be decomposed by chlorhydric acid, either partially or entirely, and would form chloride of silver and metallic silver.

One experiment we tried, in the hope of producing the subchloride of silver by a direct reaction. Chloride of silver is soluble in concentrated and highly alkaline arsenite of soda; and this solution, in the presence of excess of soda, was gently warmed. A brilliant mirror-like deposit, not of subchloride, but of metallic silver, was the result.

But with however little success the efforts to produce a pure subchloride of silver have as yet been crowned, the experiments we have detailed enabled us to institute a few comparative reactions whereby the result of treating a true subchloride (however diluted, so to say, with protochloride) with the ordinary reagents employed by the photographist may be achieved. The results yielded by these reagents were the following:—

Nitric acid, of sufficient strength to dissolve silver by heat, does not alter this dark compound.

Chlorhydric acid does not, when dilute, produce any apparent change in it.

Ammonia breaks it up entirely, dissolving all as chloride, except a minute amount of metallic silver, which remains.

Hyposulphite of Soda dissolves all except a trace of metallic silver like that left by the ammonia.

It will hardly be worth while to go through the reactions exhibited by these several tests with the dark body formed by the photochemical decomposition of the chloride of silver, or of this body mixed with excess of nitrate; for we find that these reactions are in the several cases identical. The light-darkened chloride indeed presents a deeper and bluer colour than that formed artificially; but when it is considered that the light-formed body is a coating of uniformly and completely transformed substance—superficial it is true, but continuous in its surface—while the laboratory product is an intimate mixture of discontinuous particles, the bluer tint of the one and the redder tint of the other will hardly carry much weight in deciding against the identity of the colorific silver-compound in each case. Nor will it perhaps be considered to support the view of the photochemical reduction consisting in the complete severance of the metallic silver, that the product of that reduction can be formed by the light in the presence of nitric acid. The production of an allotropic form of silver in the nascent state, in the presence of nitric acid, seems certainly to make a larger demand on the credulity of the chemist than the assertion that the reduction stops at an intermediate stage, at which a subchloride is the result of it—a subchloride, whose properties we have seen to be identical with those of a substance formed in the laboratory, and to which it is difficult to assign any other composition than that of a subchloride of silver.

(To be continued.)

ON THE PRODUCTION OF COLOUR AND THE THEORY OF LIGHT.*

By JOHN SMITH, M.A.

THE author had come to the belief, by means of experiments, that colour is produced by alternate light and shade in various proportions. To prove this, he caused a white ray to revolve at various speeds on a black surface. His first experiment was to move a slip

* Abstract of papers read before the British Association, 1859, extracted from the official report, just published.

of white cardboard over a black surface. By this motion he obtained a distinct blue; afterwards, in different weather, the same thing produced a purple. He then made a disc with five concentric rings. One ring was painted one-third black, the rest of the ring being white; the next ring was two-thirds black and one-third white; the next was three-fourths black and one-fourth white, and the fifth half black and half white. This disc, when made to revolve, became completely coloured; there were no more blacks or whites visible, but five rings of different colours. On a bright day, with white clouds in the sky, the

1st ring was of a light green: much yellow.
2nd ring purple: very blue.
3rd ring nearly as first.
4th ring purple, darker than the 2nd.
5th ring pink.

By means of eccentric motions a great variety of colours were obtained; amongst others, a pure red, and various shades of purple, pink, yellow, and blue. The number of discs tried were very great, each disc having on it a different proportion of black and white.

The author produced the same results by cutting out spaces in the white card, and causing it to revolve on a black surface. He produced also similar phenomena by causing these figures to revolve when held perpendicularly, and to take the appearance of coloured solids. He also caused these colours to be reflected on a white surface from the revolving disc. These experiments, and the views drawn from them, were used for the purpose of giving a theory of the prism, to be published in detail. It was by such processes that the author was led to believe that he had demonstrated that colour is produced by a mixture of light and shadow at various intervals; and at last he was satisfied that the experiments were original, and not explicable by the present recognised laws.

He concluded in these words nearly:—Remarkable as these experiments are, they are not more remarkable than the results they lead to.

They prove the homogeneity of the ether.

They prove the undulatory hypothesis, but oppose the undulatory theory.

They show the necessity of introducing a negative element into the theory of colour, or that colour is the effect of two co-ordinate sensations—a positive and a negative.

They enable us to dispense with the different refrangibilities of the rays of light, taught by Newton.

They remove the necessity for the supposition of different lengths of waves or of a disposition in matter to produce waves of different lengths.

They help to explain many of the phenomena of what is called the polarisation of light.

They give a new explanation of prismatic refraction, and explain, in a plain and simple manner, many very interesting natural phenomena.

Startling, he said, as these conclusions are, to those who are conversant with the subject of light, he thought he was perfectly warranted in drawing them from his experiments.

PHOTOGRAPHY IN THE FAR SOUTH.

[We have been kindly permitted by the recipient to give the following interesting extract from a letter received from a photographic friend, resident in a populous city, many thousand miles from this country; but, as it was not written for publication, we are precluded from mentioning the precise locality, or the names of the parties referred to in the letter. It is always pleasant to know what our absent photographic brethren are doing with reference to our art. —Ed.]

My dear Friend,

* * * Photography goes on swimmingly. I have just been highly delighted by receiving, from London, a lot of apparatus exactly the reverse of what I had ordered. The camera is not portable, as ordered, and the lens does not cover the field. A novice might receive such a lot of things, and have gone mad over not getting the corners of his pictures clear. Why cannot they test their instruments before sending them out? The lens would cover the glass well enough, only there is such a pile of brass work behind it,—and it won't shoot round the corner. You will recollect Mr. ———'s instrument had the same defect, which we remedied by chipping out a 1000 feet or so of lumber, but the same cannot be done with brass work. I ordered a portable bellows camera, and received for answer that they were very unstable, requiring a complicated arrangement of struts, &c., to keep them firm. Is this a fact? Is there not such a thing made in England as a good portable camera? In France they can make them.

Another very pleasing alteration they made in my order was to send me a camera for pictures seven by nine inches, whereas I had ordered eight and a-half by six and a-half inches, and all my fittings here are for this latter size, and will, in consequence, have to be altered. Pleasant! isn't it? If you have a chance of seeing Messrs. ——— you can tell them that it is always best to execute orders exactly as sent, no matter how absurd they may seem, if they don't answer, the orderer can only blame himself.

Messrs. ——— are rebuilding their establishment on a grand scale. A new glass house is being put up on the top of the old place, and the former gallery is to be turned into a workshop. Picture-taking must be a profitable business. Although Messrs. ——— have not taken many pictures, they can afford over a thousand pounds in alterations already. Mr. ——— is astonishingly successful in getting dirty pictures, which seem to sell, however: you would not believe a Christian would use them for any purpose if you could see some of them. Mr. ———, our Scotch friend, is also doing something; but as he, for economy's sake, uses tin funnels to filter his silver bath, there is not much to be feared in that quarter. Mr. ——— has lately taken to pictures, but gets *an artist* to paint them over, in the style of some of your productions. As he uses plenty of bright colours his pictures are much admired. The new Ross lens you have sent out is a stunner: I have christened it the Whitworth gun, from its neatness and compactness. Your brother has had a small house built for it, in which I am thinking of taking lodgings next time I am burnt out. When are you going to send out some specimens of English landscape photographs? I should like to have a chance of making comparisons, and see whether your establishment here can lick them as completely in paper positives as they do in glass ditto. I received the other day a picture from home, which I felt inclined to trample upon the moment I saw it, it was such a villanous production. Is the sun so scarce with you? If it is, you should offer a premium to Niépce de St. Victor to induce him to perfect his invention of "bottling up" light; you could then advertise "direct importation of sunshine from the South Sea Islands!" and make a good thing of it.—I am, yours, &c. C. L. R.

EXPERIMENTS ON LATENT LIGHT.

By M. Thenard.

M. Thenard has communicated to the Philomathic Society the following experiments:—

1. In perfect darkness a sheet of ordinary paper was desolarised by exposing it for an hour to the action of steam.

2. The sheet of paper thus treated was divided into two parts: one was set aside to serve for comparison; the other was rolled up, and placed in a glass tube, into one end of which ozonised oxygen was passed. In a quarter of an hour the ozonised oxygen was perfectly perceptible at the other extremity. The paper was then withdrawn.

3. This same sheet thus treated was employed after the manner of the solarised papers of M. Niépce de Saint Victor, and in every respect produced the same effects. The other half sheet kept for comparison produced no effect.

4. A nitrate or chloride of silver paper treated with ozone on the contrary gave no perceptible result.

5. Ordinary paper ozonized possessed in every way all the other properties of solarised papers.

6. An ozonized paper kept for some time in a test tube gave out an odour which was not that of ozone but of an essential matter; it was, moreover, transfusible.

What can we conclude from this (asks M. Thenard), but that the phenomena of insolation (solarisation), described by M. Niépce, are chemical phenomena, determined directly by light, which acts only as an intermediate agent?

THE DRY PLATE.*

By Dr. J. Milton Sanders.

Having devoted considerable attention to the production of dry collodion plates, I thought that perhaps my experience might be acceptable. Now there have been volumes written upon the subject of the dry plate, the literature of which is quite as dry as the plates. After an experience of several months, during which time I have made several experiments upon this especial subject, I have at least convinced *myself* that all "preservative fluids" are wholly superfluous. The surface of the plate prepared in the manner I shall indicate is quite as sensitive, if not much more so, than any of those covered with the preservative fluid, so profusely recommended of late, especially by our brethren over the Atlantic. Besides this, at least one half of the trouble is dispensed with. To prepare the proper kind of collodion for the plates, all that is neces-

* Read before the American Photographical Society at the June Session, and extracted from *The American Journal of Photography*.

sary is to observe the following directions:—the pyroxyline should be of the most negative kind, that is, made at the maximum of temperature. The collodion should be the *alcoholic*—that is, containing three parts of alcohol (pure and of 98 per cent.) to one of ether.* And, finally, the collodion should be much thinner than the ordinary kind—say about four grains of cotton to the ounce. The process is simple, and so very like the usual one for real negatives, that any person competent to make the latter will find no difficulty in producing those in question. Pour the collodion on the plate, and sensitise in a forty-grain bath, slightly acidified with acetic acid, in the usual way. As soon as the plate is lifted out of the bath, wash it thoroughly in pure water. I cannot lay too much stress upon this process of washing; for, if not *thoroughly* done, a failure is the inevitable consequence. The plate should now be placed away in the dark to dry, and if the moisture of the place is not unusually great, they will keep thus for any length of time.† At least I have kept them for several weeks, at the termination of which time they were quite as sensitive as when first made. With this article, I send an impression printed from one of these dry plates twenty days after it was prepared and dried. When it is desired to take a picture, expose your plate about the same time your camera required for a wet plate. As soon as you are ready to develop, put your plate for *not over two seconds* in your bath, and then develop with the usual iron developer, as far as the reduction can be pushed. Wash your plate thoroughly, and fix in the hypo. bath. The two conditions necessary to insure success in the manipulation are: first, that the plate showed be washed thoroughly before it is observed to dry; and secondly, that it should have nitrate of silver restored to the surface before development.

These plates are generally sufficiently intense to print fine clear positives, but if not, then I find that they must be intensified by the following:—If the negative requires but little intensifying, it is best done by flowing over it a saturated solution of the sulphide of potassium. If, however, the negative should prove thin and require a considerable deposit of silver, the best plan is to observe the following:—In one drachm of acetic acid, No. 8, dissolve one grain of pyrogallic acid. Then add seven drachms of pure water, and a few drops of the bath solution. This should be flowed on and off the plate repeatedly until the desired intensity is obtained. The reason why I do not develop with pyrogallic acid is because it renders the film so rotten that the utmost nicety of manipulation is necessary to keep it on the plate. In fact, I think that while protosulphate of iron preserves the film hard and tough, it gives a more pleasing and satisfactory picture. The negative may be fixed with the cyanide of potassium, but this is not so good as the hyposulphite of soda. Besides the iron salt develops so speedily that an impatient operator like myself gets through the process without the evolution of any explative which may endanger his immortal soul! Although this process may be pronounced far from being original, still the multitude of preservative fluid processes which encumber the photographic journals suggest the suspicion that, as simple as this process is, it is but little known.

In conclusion, I need only remark that I have carefully repeated all the preservative fluid processes I could gain access to, and that I have found them all inferior to the one I have indicated. In another paper I shall give some important details upon the subject of "raising pictures" by the use of Mr. Seely's megascopic camera.

Mr. Seely remarked that he did not endorse the main conclusion of the doctor, that there was no need of other processes than the one given. The theory of dry collodion is not well understood, indeed, experimenters seemed to have gone on without theory—therefore without chart or guide. At some length he advocated the theory, that the presence of organic matter capable of decomposing silver salts or forming compounds with them was necessary to the production of a photographic image, and that gun-cotton or the dried film was not such a substance; and that therefore such a substance must be added to the bath, collodion, or film. On such a theory this added substance is in no proper sense a preservative. The wet collodion answers the condition required by the theory, but the organic substance contained is volatile, and when the film is washed and quite dry, nothing is left but inert gun-cotton film and the silver salts. Dr. Sanders's means is undoubted, as he sends the society specimens of the work, but did he not use an old collodion or an old bath?

* This collodion should be sensitised, by adding to each ounce, five grains of iodide of ammonium or cadmium, and one grain of the bromide of cadmium; shake till the salts are dissolved.

† The best method of procuring these plates entirely free from hygroscopic moisture, is to place them in a tight box containing chloride of calcian. By this means sensitised paper may be preserved for any length of time without losing its whiteness.

STEREOGRAPHS.

Illustration of East Indian Scenery, by Capt. A. N. Scott, *Madras Artillery.*

Three or four months back we were favoured by Captain Scott with a few specimens of his photographic labour in the form of half-a-dozen stereographs of some of the more remarkable native Indian Tombs: since that period this gentleman has determined to publish a series, and we have recently received through Mr. Bolton, of Holborn Bars, London, whom we are given to understand has been selected to act as agent for their publication, a further instalment.

Every experienced photographer is well aware of the difficulties arising from having to operate in very hot weather—not only from the physical causes entailing an unusual degree of lassitude and fatigue in the artist, but also from the usual unruly behaviour of the chemicals employed, which, under such circumstances, often appear to cast off all control. If we add to these the annoyances arising from materials of doubtful quality, and the necessity, not unfrequently entailed, of having to substitute one substance for another (such as citric for acetic acid, for instance, or even lemon juice for either), in consequence of the ordinary supply having been exhausted with no means of replenishing the stock without a fatal delay, it will be readily understood how an unusual amount of energy and skill is requisite to the production of even mediocre results; and no small credit is due to the perseverance to which we are indebted for the specimens now before us. For the reasons assigned, it would be absurd to criticise results obtained under such circumstances as we have been describing by the same rules that we should apply to ordinary photographs; but we may remark that, even under this aspect, they are as creditable as the general run of those published, while as regards the interest and instructive character of the subjects depicted, they are immeasurably superior. Of these we notice especially a group of three of the native princes, with their attendants, viz., *Nawaub Shumsh-ool-Oomra*, of Hyderabad, an old man, supporting his now listless frame by his arm over the shoulders of his son, the *Nawaub Iktidar-ool-Moolk*, seated on his right hand; the *Nawaub Tegh-Jung*, the grandson, a larger and taller man than either of his progenitors, being seated bolt upright in a constrained and rigid attitude, forming a marked contrast to that of the other two. The oriental costume, with jewels and flowing robes, it must be confessed, gives a very effeminate aspect to the wearers; and this is not a little enhanced by the display of certain gossamer-like muslin under-garments protruding from beneath the robes, and which bear a marvellous resemblance to ladies' petticoats. It is, however, a truly interesting and characteristic group.

Another similar group to the last named, but not quite so well executed, partly owing to a slight movement of the sitters, consists of the *Nawaub Salar Jung*, minister at Hyderabad, with a nephew on his left, and the *Rajah Narrindhur* on his right hand.

A very highly interesting specimen of the series is one representing the *Interior of the Summer Residence* of the Nawaub Shumsh-ool-Oomra, whose portrait we noticed above. This consists of an extensive quadrangle, open above to the sky, and surrounded on all sides by a colonnade, with the peculiar crenated arches prevalent in eastern edifices. A large reservoir of water nearly fills the open part of the quadrangle, and the centre is occupied by an elegantly-constructed fountain, which bears, however, strong evidence of being of European manufacture. The leaves of numerous aquatic plants are seen floating on the surface of the water; and around the reservoir are placed pots containing plants, and the curiously quaint seats, all of China, and with the appearance of which we have of late become pretty familiar. Under the colonnades are dependent numerous small chandeliers; and in front of them are blinds which can be lowered so as to protect any part exposed to the sun, the whole appearance being somewhat similar to that presented by the Alhambra Court in the Crystal Palace.

The *Tomb of a Mahomedan Lady* at Booran Sahib's Durga, near Hyderabad, looks far more like a palatial residence than a tomb, and gives an excellent idea of the style of these extraordinary edifices.

The *Hill Fort of Golconda*, as seen from the tombs through one of the arches, is excellent as a stereoscopic subject.

The *Tomb of Abdoola Shah* presents more the aspect of a temple, while, as a contrast, the *Mahomedan Tomb*, near Hyderabad, is altogether different and simpler, being composed chiefly of a light kind of trellis-work, and is picturesquely overshadowed by a fine specimen of the banian tree.

Although far inferior to the others in a photographic point of view, the *Elephants with Heavy Ordnance* will no doubt attract

much attention, as, to European eyes, the sight of two of these huge animals harnessed, tandem-fashion, to a heavy gun, presents a decided novelty.

We have little doubt that this series will become a highly popular one.

Letters to a Photographic Friend.

No. II.

MY DEAR FRANK,

THE first name I had upon my list was that of Melhuish; for as this well-known photographer has lately entered into partnership with McLean, the print publisher, of the Haymarket, this was the first establishment that presented itself in progressing westward. I found that Mr. Melhuish had as yet found no occasion to alter the plan of his metal camera, a description of which you will recollect was given in the 1st January number of THE BRITISH JOURNAL OF PHOTOGRAPHY; but he had found it impracticable to employ aluminium in its construction, that being, with our present knowledge of its properties, a very unworkable metal. My attention was then given to an examination of "MELHUISH'S UNIVERSAL OBJECTIVE," a lens lately introduced to the notice of photographers. This consists of a front and back lens of ordinary construction (excepting that the back is a little larger than the front combination, so as to include a larger angle and admit an equal amount of illumination over the entire field), together with a small extra achromatic cemented combination placed midway between them. The front and middle lens screw into the same tube, to which also *the shade* is attached. This tube slides into *the outer mounting* that carries the back lens, which again screws into *the flange* attached to the camera. By arranging these three lenses in different ways, each sized "objective" is capable of placing three different portrait combinations and a landscape lens at the disposal of the photographer, and this in the space of an ordinary portrait combination of the same capacity. I need hardly say that this is a great boon to the travelling amateur, especially when I tell you that the performance of the various combinations is very good, and the price of these "objectives" very moderate. I will endeavour to give an idea of their arrangements by describing the half-plate size.

COMBINATION No. 1 consists of the front and the back lenses, with the extra lens between them: this gives a focus of four and three-quarter inches (measuring from the back lens), and pictures four and a-quarter by three and a-quarter, and is then applicable for stereoscopic work. On fitting diaphragms over the back of the middle lens the arrangement is then suited for copying and enlarging.

COMBINATION No. 2 is produced by drawing out the inner tube, unscrewing the diaphragm and extra lens. On replacing the tube, the arrangement consists of the back and front lens: this gives a focus of six inches, and pictures six and a-half by four and three-quarters. This combination in the objective experimented on was very rapid in action.

COMBINATION No. 3 is produced by unscrewing the entire combination from *the flange*, removing *the shade* from the front lens, withdrawing the tube and front lens from *the outer mounting*, and screwing on the extra lens to the end of the tube; the front lens is then reversed in position and screwed into *the flange*, so that it becomes the back combination, and the extra lens the front one. As, however, a shade is necessary, the original back lens is removed from *the outer mounting*, and put aside, *the shade* is then screwed on to the part of the mounting that originally screwed into *the flange*, and in a reversed position, *the outer mounting* is slipped over the tube that carries portrait combination 3. This arrangement gives a long focus of nine or ten inches, and portraits eight and a-half by six and a-half. With a diaphragm it may also be used for landscapes or copying.

COMBINATION No. 4 consists of the front lens *only* screwed into *the flange*, with its tube projecting forward, and a suitable sized diaphragm screwed on to the end of it, over which a small cap slides to exclude light; the other lenses and mounting being put aside. This gives a focus of fourteen inches, and landscapes ten by eight, free from distortion, and possessing great definition.

Combinations 1 and 2 may be finely adjusted by means of a rack and pinion with a double head, so that they may be focussed from either side of the camera.

The diaphragms are readily applied, changed, or removed, as it is only necessary to pull out the inner tube to screw or unscrew them; and, as no slot is introduced into the mounting, it is in no way weakened.

In each of the four combinations the chemical and visual foci are coincident; and after examining four negatives taken respectively by Nos. 1, 2, 3, and 4 combinations of the half-plate objective, I have formed a very favourable opinion of their action, though, as you know, I have hitherto been rather prejudiced against *multum in parvo* combinations, and have preferred being encumbered with separate lenses for special requirements; but I think these new lenses of Mr. Melhuish may fairly be considered cheap and good. Six different sizes have been produced, varying from the quarter-plate up to six inches in diameter, for the back lens.

Mr. Melhuish showed me a first attempt at an extension to cameras of large size of his principle of employing metal. The model was made to a half-plate size, and consisted of a brass frame 10½ wide by 8¼ inches high, and 3⅝ inches deep: into this space, three dark metal slides, the focussing glass, a bellows body, and the base-board are packed. When in use, the metal frame is clamped by nuts on to the base board, which is framed on a telescopic arrangement, and carries a hinged support for the front of the bellows and the flange plate of the lens; this allows a range of focus from two to sixteen inches, the extension being effected by means of an endless screw, which also acts the part of a fine adjustment for the lens. The body is capable of being coarsely adjusted by an arrangement independent of the endless screw. This is a very light, compact, and efficient form of camera.

On leaving Melhuish's, I bent my steps to Thomas's, in Pall Mall; but, finding that he had nothing absolutely novel to introduce to my notice, I made my way to Murray and Heath's, in Piccadilly. [Here I may state, *en passant*, that if, in journeying from west to east, I apparently overlook any well-known photographic house, you may take it for granted that the proprietors have not called my attention to apparatus that comes under the head of *Novelties*, but are satisfied as to the efficiency of their existing models]. My attention was first given to a whole-plate portable bellows camera, of great rigidity. This instrument packs into a thickness of six inches, and when open gives a range from four and three-quarter inches to sixteen inches, for lenses of different focus. The base-board is hinged, and turns up behind the back when packed, but when lowered for use, is secured, with great firmness, by means of a short brass bar, attached by a pin (on which it rotates) to one side of the hinge-plates, fitted on each side of the camera: this bar fits over four pins, two on each side of the hinge, and is then clamped by means of a screw to the opposite side of the hinge-plate, so that it renders the hinge nearly as solid as if it were cast in one piece. This you will better understand by referring to the sketch below.

FIG. 1.

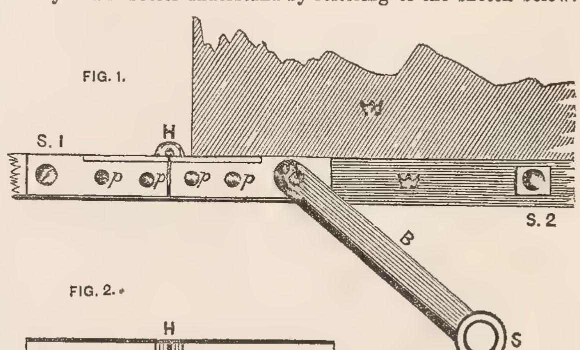


FIG. 2.

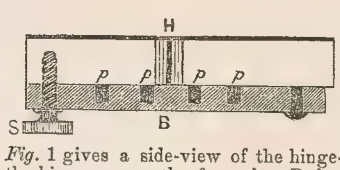


Fig. 1 gives a side-view of the hinge-plate and camera, H being the hinge, *p p p p* the four pins, B the bar that fits over them, S the head of the male screw that clamps into S 1; W W is the woodwork of the base-board and side of the camera. *Fig.* 2 gives a top view of the hinge-plate, with the bar clamped tight over the pins, the reference letters corresponding with those in *fig.* 1.

When the camera is packed the bar B turns back out of the way by being screwed into S 2, *fig.* 1. This screw and all others that are usually loose, in this camera are made so that they cannot be separated from their fittings, their loss on the field being thus prevented. The above contrivance renders the base-board so rigid

that the objection hitherto raised to this kind of folding arrangement is no longer tenable.

When the proper focus is obtained, the back is clamped by a nut placed *within* the camera: this method allows the back to be drawn *quite* to the end of the base-board, and thus saves about two inches in its available length, which would, in the ordinary way, be occupied by the brass clamping piece and the wood beyond the slot. As a rule, Messrs. Murray and Heath make all their cameras *square:* this allows the plate carriers to be placed with their greatest length either in a horizontal or vertical position. I am surprised that a plan so obviously convenient has not been universally adopted; for, although it is not by any means novel, it is an arrangement that has, as far as I have seen, been too much overlooked by camera makers of late years.

The focussing glass fits inside the camera, when packed, and the plate frames, instead of sliding down a groove the entire height of the instrument, as is usual, fit upon beads and grooves, an inch in height, placed at the top and bottom corners of the back, so that the frames have only a play of about an inch before they are in position: the greater the size of the camera, the greater will the convenience of this arrangement be found. The front slides in *a vertical* direction only, for the adjustment of the foreground; but if to this were added a horizontal motion, with a suitable plate-holder, the instrument might be employed for taking stereoscopic views with a single lens, which its short range, when shut close, would admit of (four and three-quarter inches), and the camera would then be of universal applicability on a tour. I likewise saw a camera for plates eighteen by sixteen, constructed on the same principle, which was very little, if any, thicker than the one I have described to you. I also examined a stereoscopic camera constructed on the principle of the one fitted up for Prince Alfred, by Messrs. Murray and Heath, which is an extremely convenient arrangement for amateurs; but as this has been well described in the Leader of number 119 of The British Journal of Photography, you will already have become acquainted with its design, and I will not, therefore, waste time or paper in rediscussing its merits. The double slides for dry plates sold with this and their other forms of twin lens cameras are beautifully made: they open like a book for the insertion of the two glasses, and have a hinged metal plate inside to insulate one from the other during exposure. Messrs. Murray and Heath have given great attention to the perfection of their legs (of course I do not refer to their lower extremities, but to the legs of their tripod stands); and by an ingenious construction of the hinge, and an overlapping of the wood at the point at which the limbs fold, they have secured a portable stand of great solidity, to which it is almost impossible to impart tremor.

For each sized camera they have arranged a very convenient "field box," containing twelve plates, which, with all necessary chemicals and appliances, packs into a small space.

The clamp that they employ for holding glasses during the operation of cleaning is adaptable to plates of any size, by means of an endless screw. They have also an oblong levelling stand, with pins on its upper surface for supporting four stereoscopic plates at one time, when preparing or developing them by any of the dry processes. Their pneumatic plate-holder has also an improvement on the ordinary motion for producing the vacuum; and when employed for glasses of large size, is attached to an arm, so as to give greater freedom of motion to the operator. Their collodion pourer, which is very long in proportion to its length, to allow any sediment to settle, has an inner-lipped funnel-shaped neck, capped like a spirit lamp, so that, being constantly surrounded by an atmosphere of ether and spirit, it is kept free from those hard incrustations that give rise to imperfections in the film common to the ordinary forms of this instrument: it is graduated up the side. Their glass dishes for sensitising paper are very nicely cast, so as to present rounded corners, with a very flat and even bottom; they are one inch deep; the edges are grooved, to allow a sheet of glass being accurately fitted on the top to exclude dust, and are protected by an outer pinewood case, with pads of stout felt at the angles. The last contrivance I gave my attention to at this establishment was a frame for printing transparent positive stereographs from negatives taken in the twin-lens camera. The frame is double the length of a stereoscopic plate; the negative is inserted in a cell in the centre of it; the dry plate to be printed is placed at one end of the frame, so that the right-hand end covers the left-hand picture of the negative; the back is then closed down, and that half of the plate exposed for a few seconds to diffused light; the frame is then taken into the dark room, and the dry plate removed to the other end of the frame, so that the left side of the film covers the right-hand picture of the negative; it is then exposed for the same time as the other half. This arrangement avoids the necessity of cutting the negative in half, for the purpose of reversing the position of the two pictures, and is well adapted for amateurs who may wish to print their own transparent slides; but it would not be suited for professional use, as it occupies too much time in manipulating.

I must not forget to call your attention to Mr. Smartt's tent, which, although invented in the early part of 1858, has only just been brought to its utmost point of perfection. The peculiarity of its construction is, that its framework when put together constitutes a system of triangles disposed so as to strengthen and support each other. The following sketch will convey a better idea of its arrangement than any lengthened description I can give.

Over this framework a carefully contrived covering of a double thickness of black twill is fitted in such a way that the overlapping folds at the entrance readily adjust themselves to each other to the perfect exclusion of light. This tent is both roomy and airy; and by the various contrivances for economising the available table space, affords the greatest comfort in manipulating plates, even of the largest size, the internal dimensions being three feet square by six feet high. Both the table and developing tray are contrived so as to fold up into an exceedingly small space when out of use. The weight of the whole, when packed in the case, is twenty pounds, and the tent is easily erected and taken down by one person. If I say it is decidedly the most practical and convenient tent yet introduced, I think I am borne out in my opinion by the fact that it is not only employed by such well-known photographers as Fenton, Bedford, Raven, and others, but by Negretti and Zambra, (themselves photographic apparatus manufacturers), who have sent two or three of them to their operators in China and Japan. The late Astronomical Expedition to Spain likewise took out one of these tents.

From Piccadilly I turned into New Bond Street, and called at Callaghan's, Voigtlænder's London agent, to examine the orthoscopic lenses made expressly for taking stereographs; but as they had neither negatives, prints, or camera, wherewith to test the capability of the lenses, I was not enabled to form the slightest idea as to their performance. I can only tell you that they consist of two achromatics of $\frac{5}{8}$ and $\frac{11}{12}$ inch, with a combined focus of four and a-half inches, and that they cost three pounds, seven shillings, and sixpence. Voigtlænder now makes his lenses with the visual and

chemical foci coincident. I do not know whether you are aware that the ordinary orthoscopic lenses (small size) are suited for taking stereoscopic portraits; but, when worked in pairs, they answer admirably for that purpose.

At this point I thought it time to bring my first day's jaunt to a close, so I turned my steps hotelwards, and, after refreshing the inner man, I devoted my evening to this letter, that your inquisitive mind might have its ravening satisfied with the scraps of photographic fodder I had been able to pick up.

So believe me,

Yours faithfully,

SIMEON HEADSMAN.

P. S.—I have just seen that you have handed over my first epistle to The British Journal of Photography, but I find that that wretched printer's devil has misinterpreted my MS., and broken the sequence, after the line—"But never a one to keep:" it should read—"if one is to believe the pathological investigations that have lately occupied attention," &c. As the passage stands, it does not render my meaning.—S. H.

New Collodion Process.—*By M. Poitevin.*—Take an ordinary iodised collodion containing an excess of alcohol. Before coating the plate add one part of nitrate of silver to fifty parts of the collodion. Pour on the coated plate a solution of iodide of potassium of the strength of two or three per cent., to which has been added iodide of silver. Wash the plate in plenty of water and leave it to dry. An insensible film of iodide of silver is formed on the surface of the plate. When it is desired to operate, sensitise the plate by pouring over its surface an ordinary bath solution of nitrate of silver, and then expose it in the camera. This process enables the operator to dispense with the dipping bath, a small bottle of bath solution being substituted in field work.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

FIRST OUT-OF-DOOR MEETING.

In the month of July, on its twenty-first day, in this summerless year 1860, the South London Photographic Society held—well, I suppose it *may* be said to have held—its first out-door meeting. Those who recall the leaden sky, steadily persevering rain, and damp, cheerless, wet-blanket-like feelings engendered by the day in question, will not wonder that the attendance was —hem!—*not* very large, although, as is usual with small audiences when they appear in print, it was, of course, "very select."

I promised a report of this meeting because it was a photographic experiment in the success of which many might be interested; but whether it will *now* prove worthy of insertion in our much-valued organ or not is for you, dear Mr. Editor, to decide. Perhaps I had better make it a personal narrative.

As Secretary, then, I was in a position to know that most of our members *intended* to be present; for I had heard of new cameras then first to be tested—of new modifications in existing processes then to be practised—and I had received the names of new members desirous of joining our new Society by being elected in this new manner, for the express purpose of being present at meetings so new in their character. Preparations had been actively made by our most successful operators; and sanguine hopes were entertained by us all of a glorious introduction to the out-door practical and experimental meetings of the South London Photographic Society. But, alas! "who can rule the uncertain chance" of weather? The morning came—so did the rain! The only process likely to be practised was "the wet process," and our "time of exposure" was evidently ill chosen. A new "preservative" medium might, I thought, answer, if composed of a thin waterproof coating and stout shoe leather—but who would try it? As the hour at which the train started drew near, I fancied the mournful-hued-cloud panoply appeared somewhat more transparent: hope whispered it *may* be fine, and conscience said, *you* at anyrate ought to be there. So I started off. On my way to the railway station I called upon a friend and member who had purposed going, but could not induce him to accompany me to what he called "the regions of wet green sponge and watery mud." With him, too, stayed away a party of three; but from him I took one, who, when I enquired if he had taken lunch, replied, "Yes, I have taken two whole-plate negatives, a quarter-plate positive, and———" "What a queer lunch!" interrupted I; upon which he explained that he had taken these *and* lunch in a certain short time. As we were rather late I hailed an omnibus, which in the course of ten minutes conveyed us from King William Street, by jerks, into Gracechurch Street, and there stopped. I looked at my watch. There was not a moment to spare; but what could be done? The omnibus was securely packed in a dense mass of motionless vehicles, and there was "a block in the city." So there, on that miserable "knife-board," sat we twain, listening to sarcastic Jehus, whose taunts and jeers re-echoed far and near. One driver, in an unusually large white hat, intimated, with a grimace, by pulling his waistcoat outward, that there was a vacancy within in consequence of delayed dinner; whereupon another "whip" suggested that his dinner might have got into his hat. The combination of the words "now then!" seemed to possess peculiar power in giving force to a variety of loud exclamations, such as "keep moving!"—"where are you going to?"—"hold hard!"—"don't be in a hurry!" Escaping at length from this din and confusion we reached Shoreditch Station, exactly in time to lose our train. There was, however, another, going to Stratford, and into it we jumped, resolving to walk on to the Eagle, at Snaresbrook, our appointed rendezvous. In the train we fraternised with a worthy old gentleman, eloquent in praise of rifle volunteers; and reaching our destination, found the sky of a still lighter grey, and the clouds on the move. Good signs for hope! A fresh summer breeze saluted us as we got into the free country road, and anon specks of sweet, sweet blue peeped smilingly out from the wide outspread veil of monotonous grey. On we gaily trudged. The sunshine streamed through the breaking clouds at last, and the rain drops, which but now were full of cheerless images, became redolent of suggestive beauty, being no longer the clothes-soaking, mud-making, nasty, wet things they were, but flashing gems, glorious brilliants, diamond drops glittering on the foliage of tree and hedge, like the fabled fruit in Aladin's magic cavern. We had not brought our cameras, thinking the chance of using them too small to warrant (for we patronise the "heavy wet," not the malt process) the trouble of conveying apparatus; but now how we regretted it! The beautiful "bits," the charming effects of light and shade, &c., seemed to assume new beauty, as if to mock our helplessness. Here a group of elegant ferns, looking as if nature, with an artist's touch, had "*composed*" them expressly for a picture, defied us to photograph them; and there a mighty elm tree over-hanging, as if with the graceful beauty of protecting love, a neat little specimen of rustic architecture, coming out from the dark green background in a gleam of sunny light, made us almost think of rushing back to town for our cameras. But for all this, we were *very* jolly, and pitied the friends who were not with us very much indeed. I proposed "leap frog," but my friend had objections. We must have looked as merry as we felt though, for sundry rustic maidens "*couldn't* help" smiling as they passed, and, having smiled, tried, of course, to look unnaturally solemn as soon as they perceived us looking (my friend is married, so pray don't mention this again). Then my companion described a picture he had taken of "the eclipse," which represented a comically earnest youth, watch in hand, staring through a piece of smoked glass, which he had unconciously pressed against his nose, thus securing an unmistakable image of "the point of contact." And so, chatting, joking, and laughing, we reached the "Eagle" aforesaid.

Alas! we found no one there — no, not one! After certain refreshing draughts, we started towards the railway station, and we met "a member." Looking down one of the pretty green lanes—oh! joy!—we saw on its three thin tall legs — *a camera!* Starting at the run towards it, we spied another!

"There's Hannaford!" cried I.

"There's Howard!" cried my friend.

And, truly, there *was* Hannaford, with a few others; but, sadly, there was *not* Howard, but some one whose figure resembled that of our excellent Treasurer's.

Well—for I must not be too long in recording a failure—the afternoon was a glorious one; the sun was fairly out; and the colossal clouds, like mountain masses of sun-illumined snow, melted in their silent majesty from the clear blue zenith. I longed to photograph them, for it was just the sky for the purpose. The "uncultured flowers of the wild," with the tears of heaven in their fragile cups, filled the air with sweet odours; and several bouquets of these wild beauties were gathered for the two ladies, who alone of the many we expected had armed themselves — prudently — with umbrellas, and bravely ventured forth. Of course we met "the gipsy," who was most intensely anxious to enlighten her "merry" gentlemen and "pretty" ladies upon the fortunes the future had in store for them, and by whom I was informed—gratis—that for all I had been "so unsettled" I should "settle down," &c., &c., &c., but who was, nevertheless, strangely bound by some mysterious, and doubtless *very* terrible bond, never to tell an *entire* "fortune" for nothing.

The gipsy was succeeded by a timid, bashful beggar girl — yes, a *real* beggar girl *really* bashful! (there's a novelty for you!) — who stood afar off, and in a quiet little way asked us to give her "a ha-penny." She was a little, chubby, brown-faced child, picturesquely rough about the head—not at all communicative, and prettily bashful, just as an ordinary timid child might be; by no means one of your whining, cunning, hungrily-eager town beggars, but evidently one new to her pitiful trade, and, happily, all unconscious, as yet, of its degrading character and influence. God help her out of it, and that, too, speedily!

A number of dry plates were exposed; but the light changed so rapidly that a scene beautiful when you took the cap from your lens became gloomy and dull not many seconds after, in consequence of the way in which that laughingly mischievous old Sol played "bo-peep" with the passing clouds. Wet collodion would have secured such effects before they could have fled. The great drawback, however, was motion in the

foliage, which really seemed to enjoy a quietly laughing whisper at the way in which it baffled our efforts; and this, perhaps, would have proved even a greater enemy to success with wet than dry plates.

I did hope I should have had to chronicle matters of more importance than the foregoing trivialities, as I fear you may think them; but, have patience, and next month I may do better. Without detaining you much longer I will add that, although this our first out-door meeting has been undoubtedly a failure, purely in consequence of the weather, it certainly goes to prove that no party of what is called "pleasure" can so truly deserve its name as one possessing that community of feeling and purpose rarely to be met with in a promiscuously selected company, got together with very little reference to tastes or pursuits; for, even under the unpromising circumstances described, we contrived to be very much amused, interested, and pleased.

The August meeting will be held *(weather permitting)* on the third Saturday of the month, on Hampstead Heath. Members to meet under the Scotch Firs, at half-past two o'clock, p.m.

A Photographic Pic-nic, to be composed of members and their friends, having been proposed, those who may be desirous of joining the party will please to intimate the same to me at their earliest convenience.

A. H. WALL, HON. SEC.

FRENCH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the Society was held on June 15th, M. Regnault (of the Institute), President, in the chair.

M. Champion was ballotted for, and duly elected a member.

M. THOURET presented to the Society three positive proofs, one being the reproduction of a sketch, the two others of engravings.

M. MAULEZ called particular attention to the remarkable tone of these prints.

M. EDOUARD DELESSERT presented to the Society two positive prints of very considerable dimensions (about thirty-two inches by twenty), produced direct by enlargement from the little negatives taken for the purpose of printing the so-called *carte de visite*. These two proofs excited considerable interest amongst the members present at the meeting, as they presented the remarkable feature that each print was made up from two separate sheets, with the lines in perfect juxtaposition by means of pasting the two edges of the paper together.* M. Edouard Delessert conquered the difficulties presented in the manipulation of proofs of such large dimensions thus:—the three sheets being salted, sensitised, &c., in the same baths, and under exactly the same conditions, do not present any difference under the action of light, or in the fixing and toning baths; consequently the design possesses exactly the same tone and the same tint over its entire surface.

The thanks of the Society were voted to M. E. Delessert for his gift.

M. BERTSCH presented to the Society a proof, twenty-six inches by seventeen inches, obtained by enlargement from a negative two inches by one and one-third of an inch; and on the invitation of M. Regnault, he gave, as *á propos* to this proof, a very perspicuous explanation of his method of procedure in obtaining the same. [See page 217].

At the conclusion of M. Bertsch's communication, the PRESIDENT begged to observe with regard to it, that M. Civiale, jun., had already forestalled him (M. Bertsch) in the construction of a camera of small dimensions. This camera, specially destined for the taking of views for military reconnoiterings, is of such simplicity that it may safely be put into the hands of persons possessing very little knowledge of the photographic art.

With regard to the difficulty in the obtainment of positives by enlargement, mentioned by M. Bertsch, he begged to add that, without doubt, it would be necessary to make use of the heliostat in order to obtain good results; but that if the construction of heliostats of dimensions as large as the enlarging apparatus will require is rather unusual, it may, nevertheless, be simplified, thanks to the particular circumstances in which the operator finds himself. In fact, in this case the rays reflected by the mirror need not be horizontal; and it would, moreover, be easy to place, on the outside of the apparatus, a pendulum, vibrating seconds, so that the construction of the heliostat would be greatly simplified, and we might easily give it large dimensions.

In conclusion, he expatiated on the correctness of the observations made by M. Bertsch, respecting the use of lenses of long focus for landscapes. Photographers, in fact, when making use of the latter, always make a mistake by putting the horizon in focus, whilst, on the contrary, the focussing should be made on the foreground only. He reminded the meeting that he had several times already called their attention to this mistake, which is of the greatest importance in the consideration of the aërial perspective.

The thanks of the Society were given to M. Bertsch for his donation.

MM. DAVANNE and GIRARD laid before the Society a negative obtained on the day of the meeting, on a sheet of dry waxed-paper, sensitised a year previously, and preserved during that period in one of M. Marion's preservative cases. The negative presented some defects, and did not quite possess all the freshness of one obtained on paper recently prepared; but it proved, nevertheless, that within certain limits negative paper so preserved retains its sensibility.

M. HUMBERT DE MOLARD asserted that he had obtained negatives of good quality on dry waxed-paper, preserved for five or six months in the same way.

The Society thanked MM. Davanne and Girard for their communication.

MM. DAVANNE and GIRARD communicated to the Society a continuation of their *General Study of Positive Prints.*

The Society thanked the authors for their communication, and ordered its insertion in the *Bulletin.*

M. GIRARD called the attention of the members to specimens of photozincography, produced in England by Colonel James, and published in an English Journal: one is a reproduction of an engraving, the other is from a photographic reduction of a military plan. M. Girard remarked that great interest was attached to this novel application to topography, which had already attracted the attention of the Society.

The Abbé MOIGNO observed that the process followed by Colonel James appeared to be exactly the same as that which had been published some time since by M. Poitevin, and he regretted that the English operators had not thought fit to give the name of the inventor.

M. PRETSCH forwarded to the Society a certain number of proofs printed typographically, according to the process he had already described. These proofs were handed over to the commission for awarding the prize offered by the Duke de Luynes.

M. WULFF exhibited the apparatus of Mr. Moule for night photography, and, in the presence of the members, obtained some collodion positives in twenty seconds.

M. HUMBERT DE MOLARD experimented with another composition which gave a somewhat whiter flame than that first shown by M. Wulff, but which seemed to give identical results.

The PRESIDENT thanked Mr. Wulff in the name of the Society for the experiments executed before them.

The meeting was then adjourned.

* *From this expression of surprise on the part of the members of the Society, we infer that French photographers are as yet unacquainted with Mr. Rejlander's* "Two Ways of Life," *and the difficulties of manipulation mastered by that gentleman in uniting the lines at the edges of the sheets of paper employed in the production of the large edition of that celebrated composition, a description of which was given in this Journal for 15th April,* 1858, *and about the same time in the* Journal of the Photographic Society.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VII. *(Continued.)*

DRAPERIES.

HAVING forwarded the background, it will be as well, before finishing the face, to do as much for the drapery. Now, here you have your main chance both for effecting a good arrangement of *chiaroscuro* and colour. In the treatment of this portion of your subject a great opportunity exists for the display of judgment and taste. Inelegant folds or breaks may, as I once before said, be lost in shadow, altered, or painted out; and any details which chance to be injurious to the general effect may also be rendered less conspicuous, or altogether removed. Folds which have value for their pictorial or descriptive qualities should be preserved with the most scrupulous care; but others, if of a superfluous character, and having a tendency to destroy the breadth, may be destroyed. (If necessary the printer can assist you in effecting the removal of folds too deeply marked to be readily concealed with your water-colours, but this will not often be the case). The more massive, graceful, and flowing your folds, the better their effect; but their character, as expressive of texture, must never be lost in attempting to secure such qualities.

Now, with regard to the colours of your draperies: these should not be a mere matter of imitation, but rather one of careful selection and thoughtful combination; therefore it is as well to obtain from your patron, where necessary, some latitude for your own taste and skill.

Please to lay down your brush awhile and go back to Chapter III., which was dedicated to the consideration of the principles of colouring, and then let me chat to you upon the subject for a short time longer.

You know what the key-note is to a musical composition, of course, and its importance in the realisation of harmony. Now just as important in regard to the same result, and of exactly the same character, is the key-tone of a composition of colours: that is to say, the tone given by some predominant colour to which all the others have a subordinate relation. Thus, supposing the key tone be orange, any colours you introduce will be duly made to harmonise with it: the purples by becoming warmer or more red, scarlets and yellows more or less orange, greens more yellow, blues of a warm grey tone, and, in short, all colours will be modified by the introduction of orange into the composition, either directly or indirectly, according to the peculiar qualities of the colours and pigments.

The harmonious effect thus obtained is preferable, I think, to the more brilliant result given by greater contrasts, or a more striking diversity and purity of colour. We find this repose and harmony characteristic of nearly all the works of nature, in the most beautiful of which we find the fewest unbroken or positive colours. Of course nature also presents us with harmonies of contrast as well as analogy; but the former are but few, very few, compared with the latter. Take, for instance, the beautiful colours flowing into and from each other in the rainbow, the clouds at sunrise or sunset, &c. In the best pictures of our greatest masters the primary colours are very sparingly employed. But do not mistake my meaning, and neglect the important principle of variety in colour; I merely wish to impress upon your mind the importance of connecting affinities. The harmonies of analogy and of contrast have, however, been touched on in a previous chapter, and therefore need detain us here no longer.

I have seen some charming results from the following colours judiciously combined in their proper proportions:—

White, pale sea green, and rose colour.
Light yellow, purple or violet, and blue.
Pale green or blue, yellowish white, and red.
Orange, purplish violet, and blue.
Pale green, purple, and pink, &c., &c.

In adopting the above arrangements remember that the proportion of cold colour should not be large, but only just sufficient to counterbalance the warm. You should calculate their (the colours') relative degrees of power (see Maxims 8 and 13), and may consult the geometrical rules which have been adduced by various experimentalists for this purpose;* for the present take the following as a guide:—Red is to green as 5 to 11, yellow to purple as 3 to 13 while blue and orange are generally considered as of very nearly, equal power (see the chapter on colours as pigments). You will discover that certain colours must be kept apart, such as purple from red, red or green from yellow, blue from green, purple from blue, and so on; and that too large a proportion of pure colours impart a very gaudy and inelegant appearance to your picture (see Maxim No. 14).

We come next to consider the effect our colours will have upon the flesh, to which they must all be primarily under subjection.

Of course you would never think of bringing pale blue in contact with a sallow skin, pink near a red face, or deep red near a pale one; because the pale blue would make the first more strikingly sallow; the pink cause the red face to appear more fiery than ever; and the deep red, by taking the very faintest tinge of pink from the pale pace, cause it to appear absolutely ghastly. On the contrary, you would keep neutral tints near the sallow face, to give its fresher hues the better chance of discovering themselves; you would bring a deeper red near the too ruddy face, to make it, by contrast, appear the paler; and, to give some delicate, fresh pink to the sickly skin, you would bring near it pale green.

If you place pale orange near a fair colourless face, it will make the poor thing look rather blue, because blue is the complimentary of orange; rose colour will destroy the delicate pink of a fair face; and a brown complexion will appear whiter when contrasted with dark colours. Referring to the excellent work of M. Chevreul, before noticed, I find that he considers the white, or Caucasian portion of our race, under two types:—

"The one with light hair and blue eyes,
The other with black hair and dark eyes."

Light hair he considers as being essentially the result of combined red, yellow, and brown; the two first colours giving it the character of a broken orange. The skin he also considers as representative of a pale orange, and its various hues sufficiently allied to the same to justify his assertion that the harmony of the whole is that of analogy.

Dark hair, associated with dark eyebrows, eyelashes, and eyes, contrasting with the white and rosy hues of the skin, he, on the contrary, considers as illustrative of the harmonies of contrast.

Now, we all know from experience how blue, the complimentary of orange, is always considered to accord well with fair complexions, and how the harmony of analogous hues best associate with the same. We also learn, from the same source, that the more powerful contrasts of colours are always *felt* to be more harmonious in connexion with the dark type.† Modifications of the types will of course suggest corresponding modifications of the associated colours; but the foregoing conclusions may form the basis of all your arrangements in reference to the colours of draperies, head dresses, &c., with reference to complexions.

* No work on the subject equals Chevreul's.

† "Yellow and orange-red, contrasting by colour and brilliancy with black, and their complimentaries, violet and blue green, in mixing with the tint of the hair, are far from producing a bad result."

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

A New Subscriber.—I can only refer you to the back numbers: the repetition of such information would be unfair.

Chromo (No. 2).—Changeable silks are most pleasingly effective when the lights and shadows are not of crudely contrasting colours. They have three colours, two distinct, and a third formed by their combination; but these again are liable to certain modifications from the effect of their polished surface, direct light, reflected lights, and shade.

Foreign Correspondence.

Paris, July 25, 1860.

On Friday, the 20th instant, the monthly meeting of the French Photographic Society was held under the presidency of Mons. Regnault, of the Institute. The meeting was numerous, and the animated conversations before the opening had for their principal topic a regrettable fact which is exciting general discontent. On behalf of Mons. Quinet, a seizure has been made, both at the artist's and at the manufacturer's of Woodward's solar camera, of apparatus with two or several objectives, and of stereoscopic pictures mounted as they usually are—that is, having the image protected on one side by the glass on which it is printed, and on the other by ground glass. Some years ago Mons. Quinet took out a patent, to which he has always been adding new clauses, so that it at present includes nearly everything which can be done in photography. For the most part these additions consist not in processes nor in arrangements of apparatus, but in ideas! And so he attacks, as infringing his patent rights, Woodward's solar camera, and all the instruments of the same kind which have been made, or which can be made, on the ground that he has patented the *idea* of the magnifying of photographic prints! In the same manner, because he has constructed a binocular camera, to which he has given the name of *Quinetoscope*, he opposes the manufacture and employment of any camera containing two or several objectives. I should never finish were I to enumerate all the inventions to which the said Sieur Quinet lays claim, seeing, I repeat, that he has comprised in his voluminous and elastic patent about all that can be done in photography. It is true that no doubt is entertained as to the issue of the affair before the tribunals; but it is not the less true that for several months the commercial interests of operators and makers, and the progress of the art itself, will have to suffer serious injury.

At the commencement of the meeting, Mons. Bertsch, who has incurred seizure, although he produced amplified prints with an apparatus invented by himself long before Mons. Quinet had the *idea* of so doing—Mons. Bretsch, I was saying, made a humorous allusion to the circumstance, and told us that, as he had been prevented from *amplifying*, he had *reduced*. In fact, he exhibited a small camera which he had just put together, and which was intended for the production of almost microscopic pictures. It is a brass box, the length of which from the centre of the objective to the other end is calculated in such a manner that the collodionised or albumenised glass is exactly in the chemical focus for objects placed at a distance greater than twenty paces. There is no ground-glass at the end of the box, since the point is taken beforehand, and is invariable. Upon the upper surface a water level and a quadrant index permit the operator to judge of the picture which will be represented by the photograph; for whatever is comprised within the limits of the quadrant index will be produced with fidelity upon the glass. To operate, it suffices to place the apparatus at twenty-five paces from the foreground which has been chosen. The glasses are about one-sixth the size of the whole plate. It is evident that, especially when albumenised glasses are used, this apparatus is the simplest and the most convenient that can be imagined. These images thus obtained are of the greatest delicacy. Seen with the microscope they present infinite details, for the mathematical exactness of the chemical focus takes away all indecision in the lines. These amplified with an apparatus such as Woodward's, for instance, give images of a beauty that is very near perfection.

At the same meeting, Mons. Bertsch presented two views taken by him during the eclipse of the 18th of July, in one of those rare moments when the clouds did not obscure the sun. The diminution of the solar light was sufficient to render the time of exposure

sensibly greater. With respect to the eclipse, there has been some talk of the results obtained by Mons. Foucault, one of the expedition sent into Spain to observe the phenomenon. It would appear, from what is said, that he was able to reproduce the red protuberances of the sun, but it is not known exactly to what extent his success goes. We hope that Mr. Warren De la Rue did not remain inactive, and we expect some views on the subject from England.

Mons. Lemercier sent to the Society several very satisfactory specimens of lithophotography. Most of the plates are obtained by means of two stones, as for chromolithography. Mons. Lemercier had sent with the specimens the photographic picture which had served as type, so that those present were enabled to judge, by comparison, of the degree of success obtained.

Mons. Colpaert, who forwarded a series of very interesting views of Peruvian edifices, landscapes, and negatives, communicated some useful information relative to the influence of climate upon photographic manipulation. During the summer the heat is so great in that part of the country in which Mons. Colpaert generally operates, that the cameras fall to pieces, the baths evaporate, and the collodion dries immediately. To obviate these inconveniences, the author of the communication applies, in the frame behind the collodionised glass, a piece of cloth, soaked in water. The inside of the apparatus is likewise lined with wet linen. His collodion, mixed with iodide of ammonium, is composed of seven grammes of pyroxyline, 450 of ether, and 500 of alcohol. He develops with protosulphate of iron.

Mons. Poitevin exhibited some vitrified carbon positive prints, from which excellent negatives may be taken by contact. This experiment is somewhat curious, but we do not think that its application has any great importance.

The letter in which Sir David Brewster spoke of the two drawings of Chiamonti existing in the Lille Museum, and presenting, according to the illustrious *savant*, the stereoscopic relief, has been reprinted in the *Lumière* and other special journals. We were all asking each other if the invention which so greatly honours Wheatstone and Brewster really dated from the sixteenth century?

Mr. Bingham, who has just returned from Lille, conceived the happy idea of reproducing the two designs in question to offer them to the Society. We all examined them with care, but no one detected in them the slightest difference. They appeared to all perfectly identical. In the stereoscope they are superposed, but without any effect of relief. For the present, then, we must be permitted to doubt that they were intended for the application Sir David attributes to them.

Lastly, Mr. Graham laid upon the table several cast-glass dishes, which are very convenient, especially for development, and of a very moderate price.

The meeting was enlivened by the perusal of a letter in which an amateur asked for the explanation of a singularity presented by a picture sent in with the request. It was the portrait of an officer, decorated with three crosses: the image, a very clear one, bore six crosses—that is, the three decorations had been produced twice, as if the chest, during the exposure, had made an upward or a downward movement. Yet, as I have already said, the rest of the picture was very clear. Was it an effect of reflection? or had the photographer, in recommencing the portrait upon the same glass, cleaned the latter insufficiently? The singularity caused much laughter, but found no explanation. I offer the case to your readers; may be, some of them will be able to satisfy the writer of the letter, and give him an answer to his riddle.

ERNEST LACAN.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

REPORT OF THE SCOTCH COMMITTEE ON LENSES.

To the Editor.

Sir,—In your remarks at the last meeting of the London Society, you say that when the report on lenses was submitted to the Photographic Society of Scotland, you pointed out that the committee assumed to have discovered something extraordinary, viz., "that the position of the diaphragm in front of the lenses produced a barrel-shaped image of a square original, and the diaphragm behind produced the hour-glass shaped image." I am aware of only one report on lenses which was submitted to that Society; and as I have looked over it in vain for something to warrant, even in the slightest degree, such an extraordinary assertion on your part, I have to request that you will be good enough to point out any passage capable of being so construed.—I am, yours, &c.,

Edinburgh, July 10, 1860. J. T. TAYLOR.

[The preceding note reached us so shortly before the time of our "going to press" that we were unable to include it in our last.

We have to apologise for a statement made *in error* at the last meeting of the Photographic Society in our private capacity relative to the Report of the Lens Committee of the Photographic Society of Scotland, which Mr. Taylor correctly asserts contains, as we find on reference thereto, no such claim as that attributed to it, viz., the supposed *discovery* of the fact that the position of the diaphragm with reference to the lens affects the direction of the distortion, though an impression to that effect certainly existed in our mind. It is, however, true that we pointed out the fact above indicated as one well known at the time of the issuing of the said report, that being the object of our allusion to it. It is also quite true that we styled it a "droll" report—an epithet which, though not intended to convey offence, we should probably have abstained from employing had we had time for reflection. It must be evident to every one that in an impromptu discussion it is not possible for a speaker to weigh every word that he utters; and we can only regret having said that which has been regarded as obnoxious. Under these circumstances it is, perhaps, better not to enter into the reasons *why* the report appeared to us of the character designated, as we may be misunderstood as desiring to cast ridicule upon it—a desire which we certainly do not at all entertain. Suffice it to say that we objected rather to sins of omission than to sins of commission.—Ed.]

DE OMNIBUS REBUS.

To the Editor.

Sir,—1. The other day, when taking a photograph of a plan, I found I could not get the negative sufficiently intense to obtain a white ground in the print. Could you inform me of some method of remedying this?

2. Also, when a lens of a certain focus (say eight inches) is spoken of, what is meant? I have three lenses, and should like to be able to ascertain their focus, for the sake of calculation, &c.

3. Is there an alkaline gold toning bath that will keep any length of time?

4. What is the best book on chemistry to explain about photographic chemicals, &c.?

5. Some little time back, I had a box made, about three feet long and one foot square, and reversed my camera (a half-plate one), putting the negative in the place of the focussing screen, in imitation of the solar camera. I gave the paper (prepared by the calotype process) an exposure of twenty seconds, developed with gallic acid, and succeeded in getting a pretty good enlarged positive. This was in the ordinary diffused light, without a condenser or anything else. I am an amateur in the fascinating art, and should feel much obliged if you could give me any information on the above subjects.—I am, yours, &c., PHOTO.

Kensington, July 18, 1860.

[1. A collodion that has been some time iodised will generally give density enough, though the exposure required may be somewhat longer. Also, when developing, the addition of a small quantity of dilute albumen materially assists in obtaining a dense deposit.

2. A lens of eight inches focus means one that would have a distance of eight inches between it and the sharp image of the sun formed by refraction through it. This definition, however, only holds good for a thin single lens, say a spectacle glass. With a compound lens, the form and construction has much to do with the focus, under any given circumstances. (See the papers by Mr. Grubb, recently published in this Journal.) With a compound lens, its *equivalent* focus can be ascertained by comparing the size of an image of any given object formed by it with the image of the *same* object formed by a spectacle lens (the focus of which you can measure) at the same distance.

3. No.

4. Hardwich's *Manual of Photographic Chemistry*.

5. See an article by M. Bertsch, in the present number.—Ed.]

DRY PROCESS WANTED.

To the Editor.

Sir,—Lately I have been preparing my photographic plates by the collodio-albumen process; but I find that I cannot spare time enough to continue preparing and developing them in that laborious manner, and, consequently, I should feel much obliged by your informing me whether there is no process by which, firstly, I should lose less time in developing and preparing? and, secondly, whether I should have plates as sensitive, or more so, than by the collodio-albumen process, and which would keep undeteriorated during about a week?

Would the malt process, described in your last Journal, not be likely to suit me? If so, will malt, which cannot be got everywhere, keep good during any lengthened period of time?—I am, yours, &c.

C. A. G.

[We think you will do well to try a modification of Fothergill's process, employing about two grains of an alkaline citrate or phosphate in each ounce of dilute albumen, say one part white of egg to three parts water.

The malt process has been very successful in some operators' hands; but others have not done well with it. We prefer Fothergill's.—Ed.]

LOST IN FOG!

To the EDITOR.

SIR,—I beg to trouble you again for a little advice. I am terribly bothered with "fogging" of my plates. The Photographic Guide Books say it may proceed from alkalinity of the bath; but on testing mine it always gives a pink tinge with litmus. Again, they say it may proceed from super-saturation with iodide of silver; but it cannot be that in my case, as I have added six ounces distilled water to sixteen ounces bath, and made up the deficiency with nitrate of silver. I was completely put to a stand the other day by the plates being all fogged and *streaked* from top to bottom in the direction of the dip, and no image at all could I get, although I tried all sorts of exposure and all sizes of stops. Can you explain this? Sometimes I have got my bath right, but cannot get my negatives intense enough.

Ought a good negative to require more doses of pyrogallic developer than one? I use half an ounce of pyrogallic developer (three grains pyrogallic to one ounce) and twenty drops of a thirty-grain solution of nitrate of silver for a stereoscopic plate.

I had a most provoking mishap the other day. I went down to the ruins of an abbey, about three miles distant, and carried all the apparatus, tent, &c., for the wet process. When I commenced I found the plates all blackened in developing. A photographic friend had been kind enough to dose the bath with ammonia and make it quicken. However, having some acetic acid, I neutralised or acidified it, and managed to get about four clear positives on glass for my day's work.—I am, yours, &c.,

OLD FOGEY!

[You should bear in mind that excess of nitric acid in the bath is a cause of fogging quite as much as excess of oxide of silver, when you work with a collodion not containing bromide. With reference to super-saturation with iodide of silver, we do not quite understand how it can happen; but of this we are sure, viz., that you have added too much of the uniodised solution in applying the remedy.

Unless your collodion contains a bromide, the developer is made with three times more pyrogallic acid than is necessary. The negative on a stereoscopic plate is often of the right density without any addition of nitrate of silver, unless the collodion is of bad quality, or is bromo-iodised.

Your friend acted unadvisedly in dropping ammonia into the bath at random. A grain or two of carbonate of soda would have been safer in the hands of a beginner.—ED.]

CLEANING GLASS—PROTRACTED EXPOSURE.

To the EDITOR.

SIR,—I am quite at a loss for a plan for cleaning glasses. I have tried Tripoli powder, which is too expensive; gilder's whiting, which causes too much dust in my glass house.

I have been thinking of a strong solution of potash, soda pearl ash, or nitric or sulphuric acid, intending to leave plates in this until wanted, then wash well in clean water, and carefully dry with two clean cloths, finishing them with chamois leather. Would this be a good plan? Which of the above would be best and cheapest to make solution with? and what strength would be required?

I have latterly found my time of exposure for positive portraits thirty, forty, and fifty seconds, which is much too long in a glass house with good light. My lens is Derogy's half-plate, and has worked in eight and ten seconds. Do you think I may have put in the glasses of lens wrong after cleaning them? If so, how can I set them right?

My bath is in good order, thirty grains, and by test paper correct. I use Keith's developer, pro. nit. iron, made with nitrate of baryta, fresh made; Cammack's collodion, sometimes Keith's.

I would like to work much quicker, for taking dogs, horses, &c., but cannot attempt it in my present difficulty.

By favouring me with your advice on these points you will much oblige.—I am, yours, &c.,

Liverpool, July 12, 1860. MINNEHAHA.

[It is possible that your annoyance may arise from the kind of glass which you use: the colourless sheet glass is very apt to cause failures. Again, your cloths should be washed in soda and water only (no soap should be allowed on any account to be used), and then well rinsed in plenty of water. We think you will find the following a good plan for cleaning your plates:—Mix one part of nitric acid with three parts of rain water, and put your plates therein. If requisite rub the surface with a smooth cork, then hold under the tap and rinse copiously; place the plates on end to dry. Just before use pour on your plate a little *waste collodion*, and while still in a liquid state rub it all over the plate with a clean cloth, and continue this, occasionally breathing on the plate, until the whole of the collodion has been removed. We know of no better or quicker method than the above of obtaining a beautifully clean surface. If the plates have been previously used, and albumen or gelatine employed, they must first be cleansed in soda and water.

We do not think it probable that your lens is in fault with regard to the lengthened exposure; possibly the addition of a little bromide of cadmium to your collodion (say half a grain to the ounce), and a small excess of protosulphate of iron in the developer may assist you. Some operators find that a forty-grain nitrate bath works quicker than the ordinary thirty-grain one.—ED.]

ADDITION OF OLD COLLODION TO BATH.

To the EDITOR.

SIR,—My old bath having got out of order I made up a new one, the nitrate for which, along with the collodion for negatives, I purchased from one of the first houses in London, in the hope of being more successful than I had been for some time back; but I am much disappointed and dismayed to find myself in a worse position than before.

I iodised the new bath by pouring in about three ounces of old collodion to about sixty-five ounces of bath, thirty grains to the ounce. It is quite neutral, but it does not run freely from the plate, which, when taken out, has a greasy appearance, not like that which it has before being fully sensitised, but as if the bath had been thickened. There is also a sort of streak or cloudy appearance round the top and right-hand side of the plate, at about half-an-inch from the edge, a great part of which breaks off during the development and floats over the plate; moreover, the negatives are weak at all exposures.

As the bath smells strongly of ether, I have supposed that the old collodion has something to do with this state of things, which I have tried to get rid of without effect.—If you will kindly suggest a remedy you will confer a great favour on, yours, &c., HUNTS.

[We do not agree with the plan of adding so much old collodion to the bath, as the ether invariably makes the plates greasy. Remedy the defect as far as you can by pouring out the bath into a flat dish and leaving it exposed all night in a dark room, filling up with distilled water to the proper bulk on the following morning. The streak of which you complain is from allowing the plate to become too dry before dipping, and will disappear if you immerse more quickly.—ED.]

MANIPULATORY DETAILS.

To the EDITOR.

SIR,—I shall feel obliged by your informing me of the causes of the undermentioned imperfections in my negatives by the wet collodion process:—

1. Streaks on the plates, commencing from the bottom upwards.
2. The negatives have a black transparent appearance in the high lights, and, in consequence, print the pictures either very light without detail, or, if exposed to the sun for a longer time, the print is nearly black all over.
3. By adding the drops of silver solution to the developer, and pouring it on the plate, the solution goes muddy *directly*.
4. I thought of trying Keene's negative collodion. Would you advise me to do so?

With thanks for past favours, I am, yours, &c.,

July 12, 1860. AN AMATEUR IN A FIX.

[1. Clean your slide, and do not use dirty blotting-paper for draining on.—2. Probably bad collodion, or under exposure. See that your bath is not too acid.—3. This suggests the idea of the bath being in fault. Try intensifying with a developer containing half a grain *citric acid* to the ounce, in addition to the acetic acid. This will often keep the developer clear.—4. We have found Mr. Keene's collodion to be good.—ED.]

ANSWERS TO CORRESPONDENTS.

S. B.—Not till November next.

J. WINGRAVE (Coventry).—Bagnerre de Bigorre, Hautes Pyrenées.

JANE.—You can procure it at any operative chemist's—not at a *druggist's*.

R. A. C.—You print a little too darkly for the alkaline gold toning process.

R. A. L.—You will find the whole subject fully discussed in our last volume.

JAMES TURK.—Use a stronger solution of nitrate of silver: that you now employ gets too soon exhausted.

ALFRED.—We do not at all agree with the policy pursued in the publication you name, and certainly will not follow so shortsighted an example.

ONE IN A HOBBLE.—It is the collodion which is in fault: procure another sample from a different maker.

PRINTER.—We regret that we are unable to help you; we have constant enquiries for albumenised paper that can be relied on with certainty.

TOMASO.—Mr. Fothergill has worked in Italy with the process which bears his name. We believe he is now in that country.

F. A.—You must excuse us—we cannot comply with your request: we take our own course, quite irrespective of that pursued by the conductors of any other periodical.

ONE IN DOUBT.—You need not doubt: we can answer for the perfect good faith and excellent judgment of the gentleman you name. We know him personally and intimately.

The letters from Mr. JOHN L. DAVIS are "in type," but as we have further correspondence only just to hand relative to the same subject, we shall give the whole in our next.

JOHN A. STENNETT.—Hennah on the Collodion Process can be procured of Messrs. Knight & Son, Foster Lane, Cheapside, London. The A B C of Photography, of the London Stereoscopic Company, Cheapside.

POSITIVE PRINTING.—The continuation of MM. Davanne and Girard's report was presented at the last meeting of the French Photographic Society. A translation will appear in this Journal, commencing with the next number.

SAMUEL CROLY.—We quite agree with you: cameras are, as a rule, far too costly—that is to say, too luxuriously got up. Why not try your own hand at making what you cannot afford to buy. We have an intimate friend who made his own camera of milled-board, and dark slides, with a wood frame and sliding zinc shutters.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this* Journal *should be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 124, Vol. VII.—AUGUST 15, 1860.

In our last we threw out a hint to those intending to select a dry process upon glass to wait until after the publication of this number of the Journal before finally adopting one. We did so on account of certain rumours which reached us, to the effect that an improvement of some importance had been introduced into the collodio-albumen process by some gentlemen belonging to the Manchester Society; and though at the time we were not acquainted with its nature, we had sufficient faith in the skill of the Manchester photographers, and in the discrimination of our informant, not to feel any hesitation in making the announcement. Our readers will perceive, on reference to a paper by Messrs. Petschler and Mann which we this day publish, that our confidence was by no means misplaced, and that another very important step in advance has been accomplished by the gentlemen we have named, especially as regards the comfort and convenience of operating upon collodio-albumenised plates. Unless we are very much mistaken, the discovery will also materially assist in furthering another project which we have just now at heart; but the discussion of its bearing upon this point we must reserve to a future opportunity.

Our readers will also find in the report of the proceedings at the last meeting of the Manchester Society, at which meeting the paper adverted to was read, some very valuable practical hints relative to the details of manipulation and application of the novel discovery that plates can be prepared in such a way as to be quite uninjured by exposure to strong ordinary daylight, and yet rendered sensitive by merely being washed in a little filtered water in the dark, or in non-actinic light, and subsequently dried previously to being exposed in the ordinary way in the camera. What renders it of still higher value is the fact that the preparation differs very little from the method ordinarily pursued, the difference being a simplification instead of a complication of the process.

With regard to its efficiency we have been favoured with an opportunity of judging—a proof from a negative ten inches by eight, executed by Mr. Petschler, being before us. It is a counterpart of one laid before the Manchester Society, and quite bears out the statements made with respect to the efficacy of this method of manipulation—foreground and distance being both properly exposed and rendered. The subject consists of a house on the right of the spectator, with farm-buildings on the left; a hedge, loose stone wall, and broken gate, in the foreground; a mass of trees surround the house, and an expansive view of open country, bounded by low hills, forms the background. The foliage is somewhat deficient from *movement*, not from any fault in the process; and from the tone of the paper we are convinced that the negative is capable of producing a better result than that before us.

We have a few observations to make, as well in reference to the paper itself as to some points in the discussion which ensued. It will be found recorded that, in reply to a question by a member of the Manchester Society, as to how the discovery was made, Mr. Petschler stated that *it arose* in consequence of his having attempted to render sensitive a collodio-albumenised plate in a bath of aceto-nitrate of silver containing too small a quantity of liquid to cover the whole of the plate — that the part of the film unacted upon by the silver solution was only moistened by water in the subsequent washing — and that, on development, this part was affected more energetically by the developer than the remainder: whereupon the questioner observed, "It was an accident, then." Every discovery is, of course, more or less accidental in one sense; but the merit of the discovery does not rest in this, but in the faculty of *turning an accident to useful account*, and from which the fortuitous circumstance which gave rise to the opportunity does not detract in the smallest degree. A phenomenon, previously unknown to photographers, occurs, and this only to a very limited extent: it is noted, reasoned upon, the cause suspected, tested, found to be correct, and immediately utilised for further operations. Surely this is a discovery in the strictest sense of the term.

Regarding the assumed *rationale* we are not quite so well satisfied, or rather we think that further examination is required before adopting it as a settled affair. We do not feel certain that it may not turn out to be that immersion in water and subsequent drying of a *sensitive* plate upon which the light has been allowed to act removes the impression and restores the sensitiveness: it is at any rate an experiment worth a careful trial. There are two or three facts which lead us to this conjecture. It was noticed by Mr. Osborne, of the Birmingham Society, that Dr. Norris's dry plates which had been exposed had their sensitive condition restored by being exposed to the vapour of acetic acid. The fact was verified by our *collaborateur*, Mr. Hardwich; but the cause of such an effect neither of us could satisfactorily solve. Three years or more ago we discovered that plates preserved in various ways could have their sensitiveness restored after exposure by immersion in water containing a few drops of tincture of iodine — a circumstance which we published at the time, and which we considered to be explained by a combination of the iodine with the presumed reduced silver. Thirdly, when making experiments about two years back with the proto-iodide of mercury, for the purpose of applying it to the production of positive proofs upon paper, we found that the scarlet image formed by the action of light gradually faded out if the paper were exposed to the air in the dark room — sometimes more rapidly than at others; but in either case, the paper, having resumed its normal yellow colour, proved to be just as sensitive to the light as when first prepared. But further: after washing some of these papers that had been exposed under a negative, with a view to a removal of the surplus free proto-*nitrate* of mercury that we had purposely left in the paper prior to exposure, with the idea of assisting, by its removal, to fix the red image, we were not a little astonished on drying the paper in the dark room to find the image fade out as perfectly as before, but with enormously increased rapidity, the paper being again restored to its original sensitive condition. Indeed, on one sheet of paper we must have produced at least a dozen different impressions in succession, so that we can be under no possible mistake as to the restoration of the sensitive-

ness after simple immersion in common water and drying. It has been remarked that Dr. Hill Norris's plates should not be left too long between exposure and development, as otherwise the image fades out; and lastly, a similar effect is produced on papers prepared with nitrate of uranium.

The drift of our argument, then, is as follows:—It is proved that in various ways the impression produced by light upon *sensitive* films of several kinds can be removed and the sensibility restored; that in some cases it takes place by simple exposure to the air (in which more or less moisture may be presumed to be present); and that in a portion at least of these cases, and in some others, immersion in water or some aqueous solution, with after-exposure to the air, produces a similar effect still more rapidly. We therefore come to the conclusion that it is highly probable that moisture may be the chief agent in effecting the restoration of the sensitive collodion, and that the iodine in one case, and the acetic acid in another, may have had little or nothing to do with the matter. We do no wish it to be understood that we deem this proved, but we think that enough has been stated to show that the experiment proposed deserves a trial.

We shall probably advert to this subject upon a future occasion, as there are many more highly interesting speculations that may be opened up. In the meantime we sincerely congratulate our numerous photographic brethren upon what we think bids fairly to be of considerable utility to all engaged in landscape photography, especially those unfortunates who have to submit their sensitive plates to the ordeal of a scrutiny by custom-house officers.

It will, doubtless, be in the recollection of our readers that lately an intimation was thrown out by Sir David Brewster relative to the supposed antiquity of the knowledge of stereoscopic principles, the supposition arising from the fact that an artist, named Jacopo Chimenti, who lived in the sixteenth century, had executed a pair of pictures, which are at present preserved in the museum at Lille, and which it was alleged, on being viewed in such a manner as to allow each eye to see only one of the designs, presented a stereoscopic effect. It is very unfortunate that when an announcement of any supposed fact is once made and subsequently proved to be erroneous, it is almost impossible to correct the false impression as thoroughly as is desirable; because there must always exist many persons who read the assertion but not the contradiction, while those who see the contradiction without the previous erroneous statement, can play but a very unimportant part in its rectification. Under these circumstances we conceive it to be advisable to draw special attention to a paragraph in the letter of our Paris correspondent, M. Ernest Lacan, which was published in our last number, and from which we learn that, in order to settle the question satisfactorily, our countryman, Mr. Bingham, who is a resident in Paris, took photographic copies of the alleged pair of stereographs, and laid them before the members of the French Photographic Society at the July meeting.

When placed in the stereoscope the two pictures united perfectly, but did not present the smallest effect of relief.

We think it is fair therefore to presume that, whatever may have been the object proposed by the artist in executing the two similar pictures, it was certainly not from any knowledge of the stereoscopic phenomenon, and that Sir David Brewster was in this instance wrong in his conjecture. It is but right to add that Sir David had not had ocular demonstration of the alleged fact when he threw out the suggestion.

ON A HITHERTO UNKNOWN PRINCIPLE IN SENSITISING DRY PLATES.

By Messrs. Petschler and E. Mann.

[Read by Mr. Mann at a Meeting of the Manchester Photographic Society, August 1, 1860.]

Mr. Petschler and myself having lately made several experiments on some modifications of the collodio-albumen process, we have now thought it desirable to lay the particulars of them before this Society; and we have great pleasure in doing so, as we believe we have some new chemical facts connected with the iodides and chlorides of silver to communicate.

The collodio-albumen process is an excellent one when the plates are used soon after preparation; but blistering of the film, and a deposit on the surface of the plates during development, are troubles known to all followers of this valuable dry process. The modification which we have the pleasure of bringing before your notice this evening has the following advantages:—the plates develop very quickly, and are remarkably clear and bright, and, most important of all, no second or aceto-nitrate of silver bath is required. As there cannot possibly be any free nitrate of silver left, the plates, upon theory, ought to keep as long, if not longer, than any known process.

The method we have adopted is as follows:—the plates are prepared as they would be for collodio-albumen, with this exception, that instead of coating the plates with iodised albumen they are covered with albumen containing about one or two grains of chloride of sodium to the ounce; the plate is then insensitive to light, and may be, after being allowed to drain and become surface-dry, either baked in the oven or dried before a hot fire.

Now comes the peculiarity which Mr. Petschler has the credit of having discovered, and which, though apparently trivial in itself, produces a most wonderful effect: instead of dipping the plates in an aceto-nitrate of silver bath, *they are simply washed thoroughly under a stream of water*, and this renders the film *again sensitive to light*, and after being dried are ready for exposure in the camera.

I will now endeavour to explain what we suppose to be the reason of this return of sensitiveness produced by the washing, and the real change which takes place.

It appears to us to be simply that the excess of chloride in the film makes the plate insensitive to light, and the washing dissolves out all the free chloride of sodium, and leaves nothing but the pure and insoluble silver salts behind. To satisfy ourselves that this was correct, and that some ascertainable change was effected, we took a stereoscopic prepared plate, and placed it in a dish, with just sufficient water to cover the surface, and after allowing it to soak for a few minutes, and shaking the water backwards and forwards over the plate, we placed some of the water in a glass measure, and tested it with a few drops of nitrate of silver solution, when immediately a very dense milky substance formed in the water, which was chloride of silver.

To make sure there were no chlorides in the water previously we dropped some silver into it beforehand, but no perceptible milky effect was produced: this test convinced us that a very important change was effected by the washing. We have also found that the ordinary iodised albumen plates, prepared for collodio-albumen, may be rendered sensitive in the same way, namely, simply washing away the free iodide of potassium, and leaving only the pure and insoluble iodide of silver behind. I will now describe a very peculiar difference in the effect of putting the plates prepared with iodised albumen and chlorided albumen in the second or aceto-nitrate bath. A plate with iodised albumen developed better on the part which had been dipped in the second silver bath; but here is a plate prepared with chlorided albumen and you will observe the very reverse, for the part which has been plunged in the silver has developed less than the part which was left out and only simply washed. There is also this very curious distinction between the chloride and the iodide: the former develops quicker and better when not put in a second silver bath, but the latter develops slowly, and comes out faintly when not so sensitised a second time.

We do not assert the process to be perfect, or better than collodio-albumen in its results, but leave the subject to your judgment, and to the test of further experiments.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 10.

M. Poitevin lately described a process for producing transmitted positives by a single operation. This process appeared simple, and more correct in theory than some which preceded it; and we were induced to give it a careful trial, especially so as it was stated that pictures had been obtained equal to the transparencies of M. Ferrier. A certain mode of producing such positives would be welcomed not only by many who wish to duplicate their negatives, but also by practitioners of the photogalvanographic and carbon-printing processes. We therefore commenced our experiments in earnest, and were determined to report success, if possible.

The principle upon which M. Poitevin's process is founded appears to be this:—that an actinically-impressed layer of iodide of silver upon collodion loses its latent image and returns to the normal state when iodide of potassium acts upon it in presence of white light. Without the assistance of light, however, the iodide of potassium does not discharge the image; and, therefore, we have only to expose a sensitive collodion plate, in the first instance, to full daylight, and afterwards to replace the free nitrate of silver upon its surface by free iodide of potassium. Then, if the camera image be projected upon the plate so prepared, the lights will obliterate the previous impression, but the shadows will leave it unaffected; consequently, on developing with a mixture of nitrate of silver and pyrogallic acid a transmitted positive will be obtained.

In commencing our critical examination of this process we thought it better to inquire, at the outset, whether the destruction of the latent image by iodide of potassium in conjunction with light, but not by the same iodide acting in the dark, was an established fact. On this point we have made many experiments, and the conclusion at length adopted is, that the effect of iodide of potassium in destroying an invisible image is greatly exalted by the co-operation of light, but that it takes place to a certain extent even without light. Very much seems to depend upon the vigour of the original actinic impression, since we found, on placing a wet collodion plate in the camera, and pointing the instrument at a landscape view for the proper period of time, that a solution of iodide of potassium applied in the yellow room instantly destroyed the *half-shadows*, but did not immediately destroy the sky; hence, on washing the plate with water, and treating it with mixed pyrogallic acid and nitrate of silver, a precipitate of reduced silver took place upon the sky. It was observable, however, that the sky, although not destroyed in the above experiment, was very considerably lowered in intensity, so that it developed of a violet-blue instead of a pure black or red. Therefore it may be concluded that the iodide of potassium produces an effect even in the dark; and, if our memory serves us, M. Poitevin indicated as much in his paper, and stated that the plates would suffer if kept too long after the iodide of potassium had been applied: our confidence in the process as theoretically sound is thus somewhat lessened.

Allowing that iodide of potassium discharges the latent image slowly, even in the dark, the inquiry next arises—what effect is produced by *free iodine?* We found that free iodine *instantly* removes the most vigorous image under any circumstances; so that it is possible that the effect of light in assisting the action of the iodide of potassium may depend upon a separation of the iodine from the base of the salt.

In our first attempts to carry out M. Poitevin's process practically we met with little or no success; but this, it afterwards appeared, was partly due to our having taken the wrong sort of collodion. The difficulty was to obtain dense blacks in the shadows of the transmitted positive. With a simply iodised collodion, the deposit was so excessively thin and blue that it became impossible to strengthen it by prolonged development. When, however, a bromo-iodised collodion was substituted, a better result was obtained, and a certain amount of the red tone could be detected; on seeing which we felt that there would be no difficulty in securing a more or less perfect black by carefully pushing the action. In explaining why a bromo-iodised collodion gave a more intense picture than one simply iodised, two circumstances must be borne in mind. We must remember, in the first place, that the plate had been exposed to the full rays of the sun; and, in the second, that it had been subsequently treated with iodide of potassium. Now it is found that bromo-iodide, although it gives a very weak picture in a dull light, takes a stronger impression than simple iodide in a powerful light; and, further, that the image upon a simply iodised collodion is much more easily discharged (to borrow an expression of Dr. Norris's) than the image upon a bromo-iodised collodion. For these reasons we recommend, with confidence, that those who try M. Poitevin's process should use a bromo-iodised collodion.

The mode of developing in this process seems also of consequence. At first we were satisfied by washing away the free iodide of potassium after it had done its work, and applying to the film a mixture of pyrogallic acid and nitrate of silver. This plan produced a picture, but it was not at all equal to what we afterwards obtained by following the original directions implicitly, and dipping the plate in a solution of nitrate of silver immediately before development.

The result of two or three days' experience of the working of M. Poitevin's process has left us greatly pleased with it as an illustration of the theory of photography, but far from being satisfied that presentable pictures can be obtained with certainty by its means. The exposure in the camera is longer than we anticipated, although it must be confessed that our experiments were made when both light and temperature were unfavourable. The pictures also were not sufficiently vigorous or well defined: there was an appearance of "halation" or fringing about the lines of the image which we fancied at the time would be removed if we could succeed in imparting a little more energy to the development. Evidently the iodide of potassium weakens the *attraction* which the iodide of silver actinically impressed ought to exert towards the reduced silver, and consequently the particles fall in an undecided and irregular manner, and there is a constant danger of spots and stains. Theoretically this state of things ought to be remedied by the proper kind of organic matter introduced with certain precautions. Our own experiments, however, with the organic matter were not successful; for in one instance the iodide of potassium did not properly discharge the image when the supporting basis contained organic matter, whilst in another, although a reversed image appeared, there was more or less evidence of fogging. Still we are of opinion that something may yet be done in this direction, and that the employment of an organic substance, in conjunction with a bromide or a chloride, offers the best chance of producing pictures with warm and velvety shadows, without which the transparent positives cannot be esteemed presentable as works of art.

THE RECENT SOLAR ECLIPSE.

THE BRITISH ASTRONOMICAL EXPEDITION: A PERSONAL NARRATIVE OF THE PHENOMENA OBSERVED.

By Walter Beck.

I venture, as one who had the honour of accompanying the recent astronomical expedition to the north of Spain, to intrude upon your columns, in the anticipation that a slight sketch of our proceedings and of the phenomena we observed may not be wholly uninteresting to your readers. Unfortunately I am necessitated to confine myself almost entirely to the movements of the party of which I was a member, since the observers were scattered over an extensive range of country, and means of intercommunication were limited. For the photographic phase of the observations I must refer your readers to Mr. De la Rue's letter in *The Times* of the 9th inst., and for the strictly scientific portion to the volume which it is intended shortly to publish.

Probably not even the express train on the morning of March 15th, 1858, conveyed so many astronomers to Swindon as did the 9h. 15m. from Paddington to Plymouth on July 6th, 1860. The luggage denoted the character of the passengers. Long boxes, evidently containing telescopes, barometer cases, &c., &c., marked with the words "Instruments for observation of the eclipse," abounded on the platform, and were piled in the luggage van.

It was late in the evening when we reached the magnificent troop ship *Himalaya*, which had been placed at the disposal of the Astronomer Royal by the Government. Glad enough were we after eight hours' rail to turn into our berths.

It was arranged that we should sail at ten o'clock next morning (Saturday), but before that hour arrived a boat came alongside from the *Hero*, inviting those who chose to visit that vessel—the one selected to convey the Prince of Wales on his transatlantic voyage. A considerable number availed themselves of this polite offer, and barely returned before the *Himalaya* slipped from the buoy and stood out to sea round the eastern end of the celebrated Plymouth Breakwater.

It was a lovely day, with a cloudless sky, and just sufficient wind to keep the heat from being oppressive. We passed about half a mile from the Eddystone, and not many hours elapsed before the land had sunk below the horizon.

The fact of our having left Plymouth had been communicated to Bilbao by telegaph, and lest we should arrive too early the engines were ordered to go at only half speed. Owing to the calmness of the sea the motion of the vessel was so slight as to interfere but little with photography, and several groups were taken by Mr. Downes with reasonable success.

Towards the afternoon the Astronomer Royal called a meeting of the members forming the expedition, received from the principals an account of what they and their assistants proposed to do, and delivered an able speech, commenting upon the information given, and pointing out the particularly interesting features which might be expected during the eclipse. Through the kindness of Mr. Vignolles every observer on board was furnished with a copy of

his valuable work on the subject, accompanied by a beautifully executed map of the north of Spain, showing, by means of lines, the track of the shadow, with the calculated duration of totality at various places.

After dinner, as we approached the dreaded Bay of Biscay, many were the speculations as to what sort of weather we should encounter; some affirming that the tempestuous character ascribed to that part of the Atlantic was a myth, whilst others held the contrary. The evening wore pleasantly on, being beguiled by the excellent vocal and instrumental performances of the ladies who accompanied us; and when, after sighting Ushant Light, we were told that we were fairly in the Bay, and when we found ourselves sailing on a placid moonlit sea with but little motion, we retired to rest in a comfortable state of mind as regarded the future.

On awaking in the early dawn, however, it was evident that the ocean still maintained its character for "faithlessness." The bulkheads were creaking loudly, all swinging lamps, &c., in oscillation, and to us landsmen it was difficult to stand still in the cabin. Fortunately, on going above, we found it was an *easterly* breeze that had raised this commotion, otherwise if it had been from the west the matter would have been far worse. It was not long ere the effects of the sea became apparent. The breakfast table was but thinly attended, many were in their berths, and others were to be seen in various stages, from that of utter despair to semi-joviality. The day passed by, and towards afternoon it became much calmer, and "with the sun the gale died down." Dinner was more patronised, and the indisposed took heart and refreshment. On the vessel went, "gliding through liquid leagues, sliding from horizon to horizon;" and when we came on deck on Monday morning we found ourselves in full view of the Spanish coast, with its bold cliffs and distant mountains. Along this we steamed, the signal for a pilot at the fore, and were not long ere we took one on board. An hour had not elapsed before another boat came alongside which had been waiting for us all night, and in a short time we dropped anchor in the roads of Portugalete, the entrance to the river Nervion, on which the city of Bilbao is situated. An excursion steamer crowded with people came out, which sailed round us several times with the hope that they would be admitted on board. This was felt to be impossible, owing to the necessity which existed for getting the instruments and luggage safely on shore.

Not long after Mr. Vignolles, and a number of English gentlemen employed on the railway, arrived in a steamer which he had kindly chartered to take us up the river to Bilbao, and bidding a temporary farewell to the *Himalaya*, and those of the expedition who were going with her to Santander, we found ourselves on the way to the city. We could not but admire the beauty of the scenery on either side of the Nervion—fine lofty hills interspersed with vineyards and corn-fields. Many were the anxious enquiries as to customs, and other ordeals through which we expected to pass; but we were agreeably disappointed, for the Government, true to its promise of affording us every facility, admitted us without even requiring our passports.

We now separated considerably, some accepting the hospitality of Mr. Vignolles and the members of the staff, others putting up at different hotels. We found ourselves amongst friends whom we seemed to have known for years, who did everything that lay in their power to make us comfortable, and laid us under obligations that I am sure none will ever forget. Conducted by these gentlemen we "did" the town in parties. In fact, we could almost fancy ourselves in a new England, and, as if to render the illusion complete, a cricket match came off at Portugalete next day, at which the astronomers were represented.

On the same morning Professor Airey held a meeting to decide on the different stations to be taken by the observers. The party to which I belonged consisted of Mr. Joseph Beck, Mr. Joseph Bonomi, and myself; and it was arranged that we should start the same evening by diligence with Mr. De la Rue's party for Miranda de Ebro. Night travelling is never the most agreeable thing in the world, even in a first-class carriage, but in a diligence it borders on the disagreeable. We were not sorry, therefore, when, after ten hours' intolerably dusty ride, we reached our destination, Mr. De la Rue having left us about two miles from Miranda in order to proceed to his station of Rivabellosa.

Here we again met with a most cordial reception from the staff of the Ebro line, and the engineers of the adjacent sections of the Bilbao and Tudela railway, and were quickly comfortably "located" in the *parador* of Don Cirilo Guinea.

It being Wednesday we had a week to pass before the eclipse, and this flew by rapidly, being employed in choosing our station and in walking about the country, whilst Mr. Bonomi made a series of valuable sketches, embracing all the objects of interest in the immediate vicinity, the curiosities of the place, &c. Occasionally also we saw gentlemen from the stations nearest Miranda, who came to the inn as a halting-place on the way to Rivabellosa or elsewhere. Being a sort of half-way house between Burgos and Vitoria, and on the high road to Madrid, there was also a constant bustle and continual arrivals and departures.

The weather was very ominous, and on the morning of the eventful day we mounted the little hill which formed our observatory with heavy masses of cloud rolling over our heads and but faint glimpses of blue sky. We were accompanied by Messrs. Preston, Weedon, and Roberts, of the staff, the others having proceeded to a lofty mountain near Haro, in order to make sure of a good view.

Mr. Joseph Beck was provided with a 5″ telescope, by Cook, to which an extremely ingenious apparatus had been applied, by the use of which he hoped to be enabled to detect the smallest symptom of polarisation in the corona. As his assistant he had appointed me to observe the polarisation of the atmosphere during the passage of the shadow—an intention which circumstances forced him to relinquish, and to direct me to observe the general effects. I therefore viewed the eclipse through an opera-glass, furnished with a slide in the eye-pieces containing three different shades of glass. Mr. Preston used a small telescope, mounted on a temporary stand, which afforded great facilities for looking at the sun at its high elevation. Messrs. Weedon and Roberts brought their theodolites, and by a few simple contrivances managed to make good use of them. Mr. Bonomi had been engaged for some days in preparing a panoramic view of the surrounding country, and had also kindly provided us with circles, divided by intersecting lines for facility in marking down the positions of the prominences; and had placed a series of tints at the side in order that their colour might be easily noted down at the time. We also possessed a chart showing what would be the positions of the principal planets and stars during totality. This was affixed to a board for easy reference. Greenwich time was brought up from Rivabellosa, but being destitute of chronometers we were unable to take any reliable time observations: this must be borne in mind. A cock, hen, and chickens, had been procured from Miranda, in order that we might observe the effects of the darkness upon them.

The eminence upon which we had taken our station was about 150 feet above the plain, and therefore about 1600 feet above mean sea level. It was clad with vines to the summit on the south side, and commanded a fine prospect, bounded on all sides by spurs from the Cantabrian Pyrenees; whilst, at our feet, the Ebro, with its poplar-lined banks, wound past the town of Miranda. We could plainly see Mr. De la Rue's observatory, and the people flocking near it; whilst the old Castle of Miranda was crowded—a circumstance which sadly annoyed the two French astronomers who had chosen that as their position.

About an hour before the commencement of the eclipse, the clouds broke in the direction of Pancorbo, where Professor Chevallier and Messrs. Wilson and Hammond had taken their station. The proportion of blue rapidly increased, and at the beginning of obscuration, on looking to windward, we appeared to be situated beneath a vast semicircle of clear sky, which augured well for a favourable result. Beautiful masses of cloud skirted the horizon, and, though some very considerable ones passed near the sun during the eclipse, not one interfered in the least with our uninterrupted view; and the few fleecy vapours that did cross his disc before totality served only as shades to the eye.

After first contact, we watched the moon slowly creeping over the sun's face, on which we had noticed a large spot. Within about thirteen minutes of totality Venus shone very distinctly, and was easily found by covering the sun with the hand.

A feeling of solemnity and quiet gathered over all things: we felt that an indefinable something was brooding around, and this was, doubtless, owing to the strange and unnatural effects produced by the peculiar amber-coloured light shed down by the rapidly decreasing sun. We seemed instinctively to wait for the approaching storm. The mountains were slightly veiled in misty blue, and in those on which the waning daylight fell we could apparently see every rift. The vines and patches of upland among the hills assumed a yellowish-green hue; the corn-fields appeared brighter in tone; the blue of the sky diminished in intensity, until it shaded down to the same tint as the distant country seen through a ravine. Nor did the smart wind which was blowing interfere with the weird and aerie effect upon the mind. Everything seemed hushed, sombre, and gloomy. Steadily the darkness in-

creased: the minuteness of detail in the distant landscape was lost. All at once the clouds and sky to the N.W. grew very black, as if stored with wind and rain: the gloom swept on, the last bright spot of sun went out, and the total phase had commenced.

I had been inclined to regard the accounts of former eclipses as rather enthusiastic, but I now found how far they fell short of reality. Description must always fail in such matters, and the effects so continually varied that it is impossible to embrace more than the leading features.

The dark body of the moon appeared as a puce-coloured space surrounded by the corona, whose streams of light, varying in intensity, and thus giving it a radiating appearance, stretched away for a distance which I shall not attempt to estimate, since we were unprovided with apparatus for making accurate measurements. Beyond its general limit extended different remarkable beams, one of which was conspicuous from its curved and filamentary appearance. The light was far greater than we had anticipated, but the wind rendered it very difficult to form any estimation of its brilliancy by comparison with the light of a candle. We observed no flickering motion, and almost the whole phenomenon came into view some seconds before totality, that portion being first visible which was farthest from the disappearing sun. Around the body of the moon there was a faint reddish tinge, and I remarked a peculiarly bright prominence on the S.W. edge, which shone with a pale red, resembling in colour a piece of phosphorus. It possessed a cap of white light of far greater intensity than the corona.

Intending more especially to devote my time to the general effect upon the landscape, I did not particularly seek for prominences. Others of our party noted four, and marked down their positions; and Mr. De la Rue's photoheliographic pictures have indelibly fixed the places, and perpetuated the forms of many others.

We observed but three planets, which were doubtless Venus, Jupiter, and Mercury, the clouds hiding the principal stars of the first magnitude which were expected to be visible. I was, however, informed that Professor Mädler at his station perceived stars of even the third magnitude. The gentlemen at Pancorbo were also favoured with glimpses of Sirius, Procyon, Castor, &c.

After gazing about half a minute at the glorious spectacle which the sun and heavens presented, I looked around on the earth. In the N.W. and S.E., the direction of the shadow's length, the distant mountains and horizon were shrouded in the deepest gloom, nor could I perceive the faintest traces of their outline. To the N.E. and S.W., where we looked almost at right angles to the path of the shadow, the sky was of a brassy, lurid red, owing to the refraction of the light from places exterior to the line of totality. This shaded rapidly off into the deepest indigo, which was the colour of the zenith. Against the fiery glow the serrated mountain ridges stood up in intense blackness, whilst dark clouds sailed across, or rather up, from the horizon.

For some short time after totality the light clouds overhead assumed an orange tint, whilst in the S. they floated across a sky of the most wonderful blue—a blue which gave the idea that the observer was gazing upon it through a transparent yellow medium. The beauty of the southern sky was vastly increased by the depth of colour in the zenith, and by contrast with the orange of the clouds. This, however, quickly faded, and the heavens in that direction became similar in hue to those in the N., N.E., E., and S.W., only that the mountains, being much nearer to us, the glow over their summits was the more striking. Below, the valley and town were enveloped in a sickly gloom, save where, at the foot of a little hill, similar to the one on which we were stationed, the Ebro sent up a very remarkable reflexion. The vines, and indeed every thing green, were peculiarly brilliant, and we could faintly hear the shouts from the people in the plain.

Throughout the whole time of totality the few persons who had climbed the hill to watch us observed a dead silence, and we were not subjected to the least annoyance.

The *tout ensemble* at this moment will never be forgotten—the grand yet dreary prospect, the impression of awe and quiet, will never be effaced from the memory. The larks, which had been singing as in the falling evening, had ceased a little before the total phase, and as the last spark of solar light died out the hen covered her chickens and the cock composed himself to sleep.

Suddenly the N.W. became illuminated: on the daylight came, with its blue light: it shot across the heavens: a bright spot on the moon's dark edge told that totality was over, and the shadow flew with inconceivable rapidity across the mountains. In a moment the distant country lighted up, and, forgetting to take any time observations, we ran together to congratulate each other on our success. Mr. Joseph Beck had observed polarisation in the corona, and we, who had not devoted ourselves to any special object, were anxious to compare notes, and know what had been seen. The transition from darkness to light was very rapid; but we quite forgot to make any observations on change in colours, or anything else.

After doing justice to a collation, spread in a rude tent which had been erected by the men who accompanied us, some of our party went down to Rivabellosa, and were delighted to find how successful Mr. De la Rue had been.

Next morning, news kept coming in of the favourable views which seemed to have been almost universally obtained. We were, however, sorry to find that Mr. Vignolles had been disappointed at the station he had chosen—the more so as we felt that his exertions had most materially contributed to our success. The party of the staff who had been to Haro returned after a capital time for observations.

The observers now began to turn their thoughts homeward, and to return to the sea-coast. A division of our party started on Saturday, and spent the Sunday at Vitoria, proceeding on the Monday to Bilbao. The road is remarkable for beautiful scenery, and one pass beyond Villareal is magnificent. Portions of our way reminded me of the New Forest, but the hills were grander and the country wilder.

At Bilbao the expedition reunited, and awaited the arrival of the *Himalaya* from Santander. On Thursday morning she came into Portugalete Roads, and lay there till the afternoon in order to afford the inhabitants of Bilbao an opportunity of going over her.

In the latter part of the day we bade farewell to our hospitable friends, steamed down the Nervion, and by half-past six were under weigh for England. Before nightfall we had sunk the high land of Spain. Next day the Astronomer Royal called a meeting, in which various resolutions were carried, the report of which has already appeared in *The Times*. It was the birthday of Professor Airey—a pleasing circumstance, to which due honour was done at dinner.

We experienced but little annoyance from the sea, as the whole passage home was very calm; and on Saturday morning we sighted Start Point, the landmark of homeward-bound vessels. The bows were occupied with members of the expedition, anxious to catch each feature of the coast. Portland Bill was passed, St. Alban's Head left behind, the Isle of Wight rose above the horizon, and we ran by the Needles and Hurst Castle. As we entered the Solent, Her Majesty the Queen steamed by in the *Victoria and Albert*, with the *Fairy* in company, and at four o'clock we dropped anchor in Spithead. The Astronomer Royal, accompanied by the expedition, met Capt. Seccombe on deck, and communicated to him their united thanks for his extremely polite attentions, and those of the officers, during the passage out and in. To this Capt. Seccombe responded in an appropriate speech, and the astronomers then gave three hearty cheers, and every one shook him by the hand.

The time now came for parting. Some went on shore in boats, while others landed in the *Pigmy*, which the Admiral had despatched to the *Himalaya*. Our delight at once more treading on English ground was modified by regret at the conclusion of an expedition so fraught with pleasure and important scientific results. Ineffaceable records of the "*Himalaya* expedition" have been left on every mind—remembrances which will endure to the last.

Such is a brief sketch of our travels. Doubtless the more perfect knowledge of many will correct me in different points, but I must ask their indulgence.

HAVING given above the personal and original narrative of a gentleman who took part in the astronomical observations, we now append Mr. Warren De la Rue's very interesting account of the proceedings of the Expedition, which, as embodying a report on the photographic phases of the Eclipse, will have a special interest for our readers.

IN the belief that an account of the proceedings of the several parties composing the Himalaya Expedition to Spain may have some interest for the general reader, I venture to address to you the following summary of the observations made at Rivabellosa, a village near Miranda del Ebro.

The station selected was a threshing-floor, situated in latitude 42 deg. 42 min. north, and longitude 11 min. 38 secs. west, at the height of 1,572 feet above the mean level of the sea. The magnetic variation was found to be 20 deg. 20 min. west. The locality, being bounded by a beautiful panorama formed by the distant Pyrenean range, was well situated for observing the effect of the eclipse on the landscape.

My party consisted, besides myself, of Mr. R. Beckley, the mechanical assistant of Kew, Mr. Downes, Mr. E. Beck, and Mr. Reynolds. Mr. Clark, who, at Mr. Vignolles's suggestion, had acted as our interpreter, also volunteered his services, which proved most valuable during the eclipse. Each of my assistants had allotted to him a separate

duty, and to their cheerful concurrence in carrying out my wishes must be attributed the successful result obtained.

My more important object was to endeavour to obtain photographs of the various phases of the eclipse by means of the Kew photoheliograph, an instrument I designed, at the suggestion of Sir John Herschel, for the special object of delineating the sun's image by means of photography. Although this was the primary object, I had also provided myself with ample means of observing the eclipse optically.

Our instruments and portable observatory, weighing very little short of two tons, were by previous arrangement conveyed in two days to my station by the kindness of Mr. Vignolles, to whom my thanks are especially due, and that of Mr. Bartlett, of the firm of Messrs. Brassey & Co., contractors of the Bilboa and Tudela Railway.

By the 12th of July we had erected the observatory, and by the 14th had obtained the first solar photograph in Spain. During these preliminary observations photographs were made of the surrounding panorama by Mr. Downes, and the geographical position of the station ascertained by myself.

The climate proved to be most uncertain, and much serious interruption was experienced by the clouds, which frequently completely obscured the sun for the whole day. Much inconvenience was also experienced from the dust, which rendered it necessary to obtain large supplies of water, in addition to that required for actual use, in order to keep the station moistened; otherwise this enemy to photography would have prevented any good result from being obtained.

The Kew photoheliograph consists of a tube having the form of a truncated pyramid, at the smaller (upper) end of which is fixed the object-glass, 3 4-10 inches in diameter, and 50 inches focal length. The focal image of the sun formed by the object-glass is 47-100ths of an inch in diameter, but, before it is allowed to fall on the sensitive plate, it is enlarged, by means of a secondary combination of lenses, to four inches in diameter.

The sensitive plates, six inches square, are placed at the large end of the pyramidal tube of the telescope. The tube is what is termed equatorially mounted, and is made to follow the diurnal motion of the sun by means of clockwork.

In taking pictures of the sun the aperture of the object-glass is usually reduced by means of stops to two inches.

Even with this small aperture the duration of the exposure of the sensitive plate to the action of the sun is a very small fraction of a second of time. The exposure of the plate to the sun's action is effected by means of a sliding plate, having a very narrow slit in it. The plate, which moves in the plane of the primary focus of the telescope, is drawn downwards by means of an opening, and previous to taking photographs is held up by a loop of thread fastened to a hook.

When a picture is required to be taken the thread is set on fire, and the plate flashes instantly across the axis of the telescope, and allows the image of the sun to pass momentarily through the slit on to the sensitive plate.

The clockwork driving apparatus, although convenient, might actually be dispensed with in taking sun pictures under ordinary circumstances, but at the period of totality in a solar eclipse it is necessary to expose the sensitive plate for some time to the more feeble light of the luminous prominences and corona, and then a clockwork driving apparatus becomes essential; and it is also necessary to employ the full aperture of the telescope.

The photoheliograph is provided with position wires, which may be removed at will; when left in the tube they become depicted as dark lines crossing the sun's disc whenever a sun picture is taken, and serve to determine with great accuracy the position of any markings on the sun or of the cusps with reference to a normal line, for instance, with a circle of declination.

The day previous to the eclipse was completely overcast, and the barometer was steadily falling. Nevertheless four dozen plates were cleaned, so as to be in readiness for the morrow; but the 18th proved in the morning to be as cloudy as its predecessor, and it was with very faint hopes that we went to our station. At twelve o'clock the sky began to clear, and we obtained a faint picture of the sun through the clouds; about half past twelve the clouds melted away as if by magic, and we had a clear blue sky (without a cloud visible), except on the distant mountains.

About 200 persons, who seemed to think that the eclipse was only to be seen from our station, rather interfered with our operations by their conversation, which completely prevented our hearing the beats of the chronometer; but the majority were persuaded, after a little while, to go on a neighbouring height, and the Alcalde Cirilo Guinea, to whom I wish publicly to tender my thanks, and the Civic Guards induced the remainder to speak in a lower tone.

Just before and after the eclipse sun pictures were made, and during the progress of the eclipse thirty-one photographs were obtained, the times of which are carefully registered.

These will serve hereafter to determine the path of the moon across the sun's disc and other data with considerable accuracy.

The serrated edge of the moon is perfectly depicted in all the photographs, and in some of them one cusp of the sun may be seen blunted by the projections of a lunar mountain, while the other remains perfectly sharp. I continued during the eclipse to observe the sun by means of a telescope of three inches' aperture, by Dallmeyer, and I am enabled to confirm the results obtained photographically. As I observed the progress of the eclipse, I gave the signal from time to time for the taking of a photograph, so that some have been procured just as the moon passed across any conspicuous solar spot.

When the sun was reduced to a small crescent, the shadows of all objects were depicted with wonderful sharpness and blackness, and as I cast my eyes on the now silent crowd they and the landscape appeared as if illuminated by the electric light, so brilliant were the lights, so sharp and black were the shadows.

The sky began to assume an indigo tint, and the landscape to be tinged with a bronze hue. But a few moments, however, could be spared for these observations, and when I placed my eye again to the telescope, and removed the dark glass, some minutes before the totality, I distinctly saw the whole of the lunar disc, and perceived a luminous prominence on the east of the zenith. This was quite visible, while the sun's image was reflected by a glass surface fixed at an angle of 45 deg., in the eye-piece, and its intensity therefore much diminished. The upper surface of the glass diagonal reflector I had, however, silvered to the extent of one-half, and as I brought into action the silvered half just previous to totality, I perceived a large sheet of prominences on the east. A little to the east of the zenith a brilliant cloud, quite detached from the sun, and at some distance from the moon, came into view. A few degrees to the west of the zenith a minute point was perceived at the commencement of the totality. South of the vertical only one small prominence was perceived.

The brilliancy of these prominences far exceeded that of the corona. Much detail was visible in the protuberances both of light and shadow and configuration. No appearance of Baily's beads was seen.

Casting the eye for a few seconds away from the telescope to behold the corona and the surrounding landscape, I was much surprised to find that the darkness was not so intense as I had anticipated.

The deep indigo of the upper part of the sky shading through a sepia tint into red and orange as it approached the horizon, the deep blue of the mountains as contrasted with the orange sky, and the peculiar light cast on the spectator, impressed me with a feeling of solemnity never to be effaced, and which was enhanced by the ear catching the sound of the village bells, which it appears had been tolled during the eclipse. I saw two stars to the east of the sun, which I believe to have been Jupiter and Venus, and observed that the corona did not extend generally more than about eight-tenths of the diameter of the moon beyond her limb, but that there were outlying rays of greater extent. A thought of my other duties recalled me, after a few seconds' gaze, from this enchanting scene, and I did not attempt any exact observations of the corona.

To return to photography, when the disc of the sun had diminished to a small crescent I gave the signal to discontinue the ordinary pictures, and to take away the stop of the object-glass in order to have the full aperture ready for the totality; and the instantaneous apparatus was also disconnected. The signal to prepare plates for the totality was also made, and three plates, by a preconcerted arrangement, were coated and then sensitised in an extremely sensitive neutral bath, which I had prepared expressly for the purpose. As I could collect no reliable data as to the intensity of the light of the luminous prominences and corona previous to the expedition, I was working under great disadvantages, and I confess from all that I could learn previously I had very faint hopes of depicting the corona at all, and I was led to think, from the colour of the prominences, that if I did get a picture of the corona, my only hope was to get the prominences as dark markings on the supposed more brilliant corona. Although my own observations during the totality gave me greater hopes of success, it was with a thrill of pleasure that, in answer to my questions, I learnt from Mr. Reynolds that the picture was coming out under the influence of the developing fluid.

This first plate had been exposed by previous arrangement just one minute, and only time enough remained for a second plate to be placed in the telescope.

Just at this period the wind rose and shook the observatory and telescope violently. Had it been possible for me to have known beforehand how intense the light of the prominences really was, there would have been no difficulty in obtaining the photographs in much less time, and I do not doubt that four might have been procured with an exposure of from 20 to 30 seconds each.

Previously to leaving London, trials had been made to obtain photographs of the moon with the Kew instrument, merely, however, for the purpose of judging of the time that might be necessary for the pictures of the corona, supposing it to be as bright as the moon, but not the slightest impression could be obtained by an exposure of one minute, whereas the pictures we have obtained of the luminous protuberances are all over-exposed, and the corona has clearly shown itself, so that the latter must be brighter than the light of the full moon.

The plates being only 6 inches square, while the sun's image is 4 inches in diameter, it will be seen that only a small extent of the corona could be depicted. I mention this in order that there may be no misconception on this point; had I desired to make photographs of the whole of the corona, I should have adopted a totally different arrangement.

My hand drawings were made by the aid of a series of lines ruled on glass, and placed in the focus of the eye-piece. This could be rotated through an arc of 90 deg., and I had two diagrams with similar lines set out on my drawing paper. With these aids I was able rapidly to make some measurements of position and extent of the prominences, and to complete two drawings. On comparing my sketches with the photographs, I was pleased to find that each completely confirmed the accuracy of the other.

My drawings were made in reference to the vertex, but it will be better to describe the markings as they were shown in the photographs in relation to a circle of declination. If the reader will suppose a circle to be divided into four quadrants by drawing two diameters across its centre at right angles, and that one of these diameters is made to coincide with a line drawn through the centre of the sun and the pole, calling the quadrants north-east, south-east, south-west, and north-west respectively, then the edge of the moon, both in the north-east and south-east quadrants, was at the commencement of totality nearly covered with the luminous prominences which extended over an arc of 130 deg. beyond her dark limb. These prominences were extremely brilliant, and far more so than the corona; they were not uniform in tint, and, with few exceptions, they did not present any colour approaching to red or rose; two had, however, a decided but faint rose tint. The surface of the luminous prominences next to the moon was, when first seen, very irregular, and far more so than was attributable to mountains as seen in profile on the moon's edge. This irregular outline may, however, be explained by supposing the prominences to have been first seen floating like clouds in a transparent atmosphere at some distance from the sun's surface, and consequently from the moon's edge—a supposition which is supported by the fact that one such prominence or luminous cloud was seen distinctly detached, and at some distance from the dark moon.

At the commencement of the eclipse only one small mountain-like peak was to be seen in the north-west quadrant, and a curved one in the south-west quadrant. As the moon glided over the sun's disc, the inner outline of the prominences in the eastern hemisphere became less and less indented, and at last they were bounded by the nearly even outline of the moon's limb. As the eastern prominences became gradually covered, the mountain-like peak, seen at first as a mere point in the north-west quadrant, gradually grew in dimensions, then presented several points, and at last resembled somewhat a colossal ship in full sail; and extending from this through an arc of 60 deg., there came into view, in the north-west quadrant, a long streak of luminous prominences, varying in breadth and with a few points projecting outwards. This streak became very jagged in its inner outline as the moon glided off from it, just previous to the sun's reappearance—these luminous prominences presenting the same phenomena as those on the eastern edge; that is, appearing like clouds floating in a transparent atmosphere, a little distance from the sun.

It will render the detailed description I now propose to give of the several luminous protuberances, as measured in the photographs, more clear if the reader will provide himself with a circle divided into 360 deg., and number the degrees in the reverse order of the figures on a watch—namely, from right to left.

Placing 360, which represents the north point (not the vertex) uppermost, the east point, or 90 deg., will be at the left; 180 deg., or the south point, at the bottom; and 270 deg., the west point, at the right hand. Eastward from the north point there was conspicuously visible a brilliant prominence, the summit of which, as the moon glided along, was seen to curve in two opposite directions from a radial line, the curved portions being far less brilliant than the stem, which touched the moon's limb throughout the totality. The centre of the stem was 28 deg. from the north point, and it was about 1 minute of arc broad (28,000 miles nearly). It extended fully 1½ minute, or 42,000 miles, beyond the moon's limb. This protuberance was so brilliant that I perceived it several minutes before the totality, and it must, without doubt, have been seen by all observers provided with good telescopes. It may, therefore, be conveniently made a starting-point to which all protuberances of which I shall speak may be referred by those astronomers who observed the prominences in regard to the vertex, by taking into account the angular distances of the several prominences from this one.

At 57 deg. was situated the northern extremity of a remarkable detached curved cloud, which, when first seen, was about half a minute (14,000 miles) beyond the position occupied by the moon's dark limb. It presented a double curvature on its northern side, both curvatures being convex towards the north. It inclined in a curved direction at about an angle of 60 deg. from a radius towards the east, and was a minute and a half (42,000 miles) long. As the moon glided onwards in her course she approached it gradually, and at last touched the extreme point of this floating cloud, which glowed with all the brilliancy of one of our own terrestrial clouds at sunset. It presented a decided rose tint.

At 72 deg. from the north a protuberance, in shape reminding one of a boomerang, imprinted itself on the sensitive plate, although it was not visible to me in the telescope. The stem was 2 min. long (56,000 miles), the point was bent towards the north, inclining downwards over towards the extremity of the detached cloud. Midway down the stem was a branch curving upwards, so that, on close scrutiny, the boomerang protuberance was not unlike the capital letter G in ordinary writing. It is a very curious circumstance that this protuberance imprinted itself distinctly, although it did not attract the eye directed especially to that locality. This may be accounted for on the supposition that it emitted a feeble purple light.

Between the last-named protuberances (the floating cloud and the boomerang) there was a low and long luminous streak, not more than a quarter of a minute broad, and extending in length about 8 deg. along the moon's limb.

From the stem of the boomerang, extending from 72 to 135 deg., there was a long streak of luminous cloud, commencing with the thinnest possible streak near the boomerang, and then becoming broader, but in no part exceeding a quarter of a minute in breadth, until it reached the position of 111 deg., when a skittle-like thickening took place, half a minute broad in the broadest part. Projecting from the commencement of this skittle were some faint projections, which imprinted themselves on the sensitive

plate, but I did not see them in the telescope. From 129 deg. to 135 deg. there was a considerable enlargement of the streak, which widened out to fully one minute in breadth (28,000 miles). This was bounded by curved lines, and was extremely brilliant. Just in the neighbourhood of this thickening—namely, between 115 deg. and 140 deg.—the corona was very bright, and one of the long streamers was to be seen curving towards the north.

At 154 deg. a protuberance, curving northwards, and not unlike a bishop's mitre, existed, which extended from the moon's limb a distance of 1·5 min. (42,000 miles); it was very much fainter towards the point than near the stem. A very faint streak of light connected the mitre-like protuberance with the long streak.

The long streak and nearly all the mitre-shaped protuberance were covered by the moon before the totality ended, but the floating cloud and the first-named northern protuberance were visible during the whole time.

At the commencement of the totality only two protuberances were visible in the western half of the moon's disc—namely, following the order of the preceding description, one, the centre of which was situated at 194 deg., consisted of a thin streak less than a quarter of a minute broad, and extended over an arc of 5½ deg. on the moon's limb at 197 deg., a point curving towards the south, projected about ⅓ min. This projection was completely covered as the moon advanced. The other projection was the mountain-like peak, the centre of which was situated at 348 deg. This peak, at first not more than ½ min. high, grew to considerable dimensions as the moon glided away from it, and assumed, as was before said, the appearance of a ship in full sail, the summit, or mainmast, extending more than 1½ min., and the case or hull of the vessel measuring 10 deg. on the moon's limb.

As the moon glided on there came into view a long streak extending from 280 deg. to 340 deg., where it just touched the hull of the ship. This streak was in some parts a mere line, and bounded by curved lines both on the under and upper side. It thickened to about ½ min. between 300 deg. and 310 deg., at both of which places two short horn-like projections were to be seen.

At 263 deg. and 278 deg. there came into view two small projections, one extending ½ min., and the second ½ min., from the moon's disc.

I am, Sir, your obedient servant,

The Observatory, Cranford, Middlesex. WARREN DE LA RUE.

THE AUTOMATIC CAMERA OF M. BERTSCH.

M. Bertsch has named the little instrument to which he called the attention of the members of the French Photographic Society at its last meeting the *automatic camera*, as it acts, to a certain extent, *per se*. It may be used either for wet or dry processes; and, if dry collodion or albumenised plates are employed, it may be placed in the hands of a person quite unacquainted with photographic manipulations. It is the camera to which M. Bertsch referred in his paper *On the Enlargement of Negatives*, given at page 217 of the present volume, as specially adapted for obtaining the small and very sharp negatives necessary for producing artistic and well-defined positive prints by enlargement.

The camera, constructed of metal, is about 3½ inches square, and carries a plate 2½ inches square, sufficiently large for a single stereoscopic view; but it has neither plate-frame nor focussing-glass, as the position of the plate is previously determined, on the construction of the instrument, to occupy a plane that is mathematically in focus for every object or plane that is twenty paces distant from the lens. In place of the focussing-glass, however, on the top of the camera a small quadrant is placed, adjustible by a circular guide and having a square opening crossed by threads, which, together with a spirit-level, permit the verticality of the camera and the position of the picture it is wished to obtain on the plate to be seen at a glance. When the objects are comprised within the frame of the quadrant, it is certain that they will be equally projected upon the sensitive plate. These arrangements are, of course, primarily dependent upon the optical construction of the lens employed; but of this essential part M. Bertsch gives few particulars or data from which its peculiarities may be deduced. He simply states that the single combination lens he has constructed is achromatised by dense flint of great dispersive power; that, notwithstanding the shortness of its focus, it is aplanatic over a field 2½ inches square, with an angle of aperture of 33°; and that as the pencils constituting the image are very acute, and on account of the exactness of the focus the impression is rapid, admits of people in motion being taken, as the pictures he exhibited proved. Neither the principal focal length of the lens or the diameter of the diaphragm are given.

As the front and back walls of the camera are made perfectly parallel to each other, and from the whole being constructed in metal, they cannot be warped; and as all slides and frames are dispensed with after the focus has been once adjusted, every source of error that can arise in the position of the plate in relation to the lens is avoided.

The camera is placed on a stand that folds up so as to form a walking stick, the height of which is calculated for the field of vision at twenty paces to form with the line of the horizon an angle of 15°.

The negatives obtained by this camera yield images of the greatest perfection up to thirty inches in diameter. One negative, examined by a microscope, showed clearly the hour on a public clock situated at a distance of 1600 yards; also the bars on the sails of a windmill in the extreme distance, as well as the minutest details in objects at a distance of only twenty paces.

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.

Report of the Committee, consisting of Messrs. Maskelyne, Hadow, Hardwich, *and* Llewelyn.

(Continued from page 221.)

In the photographic processes in which the chloride of silver is employed, it is to be borne in mind that the chloride of silver is not used by itself—nay, by itself is quite inadequate to the production of the deep colour requisite for photographic effects. It is used in fact always in conjunction with nitrate of silver, and also, it must be added, with organic substances, among which the cellulose of the paper and the glue-like size are prominent. The action of the nitrate of silver needs little explanation; it supplies continually a fresh surface of chloride of silver, formed by part of the chlorine given off from the surface of the original chloride, which unites at once with the silver of the nitrates, and simultaneously becomes blackened by the action of the light. It is singular, however, that it has escaped the observation of the chemists who have experimented on this point that an oxide of chlorine is also formed at the same time, as may be shown by the renewed deposit of chloride of silver which is produced in the supernatant nitrate by the addition to it of sulphurous acid. That the darker compound produced by the presence of nitrate of silver is in no respect different, save that it is a more abundant deposit, from that formed from the chloride alone, is evidenced by the identity of its reactions with those of the latter. For here, again, dilute nitric acid of sufficient strength to dissolve silver at 112°, is inert in its action on this bluish-black compound. Chlorhydric acid, if not sufficiently dilute, renders it somewhat paler, and gives a brownish hue to its slaty violet, but otherwise does not alter it. Hyposulphite of soda dissolves nearly the whole if sufficiently strong, leaving but a trace of metallic silver; and ammonia acts in a similar manner, while cyanide of potassium appears entirely to dissolve it.

In order to be satisfied that the bluish slate-coloured substance formed in the presence of nitrate of silver by the action of light on the chloride was not an oxychloride, an attempt was made to form such an oxychloride by operating on the chocolate-coloured substance so often alluded to. Boiled with caustic potash, this became dark brown; but nitric acid restored to it its chocolate tint. The substance operated on in this experiment was formed from the citrate by the action of hydrogen (in this case in the presence of nitrate of silver), and treatment of the products as before, by chlorhydric and nitric acids in succession.

We consider that we are justified in drawing the following conclusions:—

1. That the action of the light on chloride of silver is to reduce it, in so far as it is able to penetrate its substance, to the state of a subchloride.

2. That in the presence of nitrate of silver this deposit of subchloride is necessarily more plentiful, while some part of the liberated chlorine passes into an oxide, which prevents a portion of the chlorine set free from conducing to the formation of fresh subchloride.

From this point we may proceed to the discussion of the photographic image in more complex, but, for the photographist, more available forms. And in doing so, we must at the outset bear in mind that the image varies in its character in different stages of the photographic process. The first result obtained by the light, even if it be the same in all stages of the solarisation, is not the result which is in many cases left after the fixing solution has performed its work; but it is perhaps more interesting, as indicating the nature of the change effected by the light, independent of the chemical reagents which are afterwards applied.

In endeavouring to reduce into orderly arrangement the great number of photographic results which this inquiry involves, it seemed best to sever at the outset two series of them which bear but little relation to each other—namely, the images obtained by development, and those which are formed visibly by the light. Commencing with the latter of these, the attention is at once arrested by the processes involving the use of chloride of silver in conjunction with the nitrate of that metal.

The rationale of the union of these two compounds for the production of an effect far greater than that upon the chloride alone has been shown; but, practically, in photographic processes there are other agents present in the paper, or purposely introduced into it, which play a part in the photochemical change hardly less important than that of the silver salts themselves.

We may fairly inquire, in the first instance, whether the presence of the fibre of the paper itself may not assist in effecting decom-

positions under the influence of light. To determine this point, Swedish filtering paper, as the type of the most uniform and pure fibre of paper that could be procured, was treated with nitrate of silver alone: on being exposed for some hours, it exhibited a pale-reddish stain, which after several days' insolation reached no deeper tone than a brown. The substitution of ammonio-nitrate of silver for the nitrate gave a rapidity to the change, and ultimately a depth of opacity to the result, by affording an antagonism, as we suppose, to the influence of the nitric acid. The reactions of the darkened ammonio-nitrate paper are as follow:—Ammonia does not otherwise affect it, than that treatment therewith (probably by action on the tissue of the paper) makes it slightly more readily acted on by other reagents. Nitric acid, though exceedingly dilute, rapidly dissolves it. Indeed an acid so far diluted that it took many hours to destroy the substance left by treating with ammonia Swedish paper that had been prepared with chloride of silver and subsequently darkened in the sun, was able to destroy this bronzed image formed by the ammonio-nitrate in a few minutes. Cyanide of potassium in presence of air rapidly destroys it, but not so rapidly as it does the image on chloride of silver just alluded to.

It would be difficult, from the above reactions, to come to any positive opinion on the nature of the photochemically changed substance left by the ammonio-nitrate of silver on pure tissue of paper. But that this tissue is not without a part to play in the changes which the oxide of silver undergoes, perhaps even a more important one than that of an absorber of oxygen, seems indicated by one curious experiment. Swedish filtering paper treated with nitrate of silver, and while still moist touched with a solution of protosulphate of iron, gives a grey stain easily recognised as metallic silver. When, however, it is suffered to dry (of course in the dark), the stain thus formed, instead of grey, exhibits a dense black tone, which immediately afterwards passes on into a brown. The former of these is probably suboxide.

(To be continued.)

DRY COLLODION.

By Chas. A. Seely.

The desirableness of a good dry collodion process is well appreciated, and it is as well understood that we have no process which completely satisfies the wants of the devotees of photography. We cannot and should not be content till we are able to prepare dry plates with as much certainty as we do the wet.

It was found at an early day that the wet plate simply washed and dried, although sometimes giving a good result, could not be depended on. The virtue of the wet plate was attributed to the moisture, and the first attempts to prepare plates so that they should preserve their good qualities for a long time, consisted in methods of retaining the moisture. These methods were, 1st, Enclosing the plate in a damp box, or covering it with a sheet of glass, so that evaporation could not take place; 2nd, The use of substances like honey, syrup, nitrate of magnesia, &c., which had the property of retaining moisture. Then came the Taupenot process which was a kind of combination of the albumen and collodion, and finally the Fothergill process which is perhaps the ultimate simplification of the Taupenot process. Also, instead of albumen, gelatine, dextrine, gum arabic, &c., have been used, and in turn have been favourites.

Most of the attempts at solution of the dry collodion problem have been altogether empirical. Experiments have been made at random in the vain hope that something might by chance turn up. It is best to work after theory—a wrong one is better than none.

I have seen no theory distinctly laid down of the dry collodion, except that of M. Robiquet, which supposes that on drying the particles of iodide of silver in the collodion film they become separated from each other, and from that cause the forces which are active in bringing about reduction in development cannot have effect, and that it is therefore necessary to add such a substance as will keep up a connexion or continuity of the particles. The substance he prefers is some gum resin like copal or rosin to be dissolved in the collodion. The theory is evidently an attempt to account for the fact that rosin is of great utility; and in my opinion it is not worthy of a serious argument.

The theory of dry collodion which seems to harmonise with the known facts, is as follows:—Salts of silver are decomposed under the action of light only in the presence of organic matter. But the rapidity and kind of decomposition materially depends upon the kind of organic matter. And there is organic matter which is quite powerless to effect any decomposition—such is gun cotton. Pure gun cotton is remarkably stable in the presence of reagents, which rapidly destroy almost all other organic substances. Pure gun cotton moistened with nitrate of silver is unchanged in the light. Hence a surface of gun cotton imbued with silver salts is not all that is required for the photographic result. Now, in the ordinary collodion process an abundance of the most suitable organic matter (ether, alcohol, &c., or substances generated by their reaction) is present, and we find the process rapid and certain. How are the circumstances changed when the sensitised plate is washed and dried? The water used in washing carries away whatever is soluble, and on drying whatever is volatile is also removed, so that, with the washing and drying, the matter which is necessary for the photogenic reaction is not present.

If this theory be the truth the problem is much simplified. The most suitable organic matter must be selected, and then we may determine how it shall be introduced into the film, whether by the bath, collodion, or subsequent to the sensitising. Of course this matter must not be volatile, or soluble in water at the final washing. The bath does not seem to be the proper vehicle, for the reason that they would probably react on each other, and it is likely that a suitable substance dissolving in the bath would not be carried away in the final washing. The introduction of the substance during or after the washing seems also objectionable, on account of the difficulty of securing an uniform penetration. The solution in the collodion, therefore, appears to be our most reasonable alternative; and when the suitable matter is found, soluble in collodion and not in water, the dry collodion process will be reduced to its simplest form.—*American Journal of Photography.*

CELESTIAL AND INSTANTANEOUS PHOTOGRAPHY.

By Warren De la Rue, Esq., F.R.S., F.R.A.S., &c.

It will be in the recollection of our readers that, in the month of October of last year, we gave a copious abstract of Mr. De la Rue's Report on *Celestial Photography in England*, read at the Aberdeen meeting of the British Association for the Advancement of Science. But in an abstract which is intended to embrace a general view of the ideas propounded by the author, it is impossible to include any of the minute details so requisite to those who wish to apply photography to astronomical purposes; and as this application is daily increasing in interest we purpose extracting largely from the practical parts of the "Report," especially as the instructions given are also available for those wishing to follow out the production of Instantaneous Photography. We therefore commence with—

Actual Process employed at the Cranford Observatory.

With the view of facilitating the labours of others desirous of entering the field of photography, I will now describe, with all necessary minuteness, the process finally adopted after many trials and failures; I would remark at the same time that it is quite impossible to give such directions as will enable another operator to ensure perfect results, as this can only be attained by perseverance, long practice, and a strong determination to overcome obstacle after obstacle as it arises,—therefore, no one need hope for even moderate success if he dabbles in celestial photography in a desultory manner, as with an amusement to be taken up and laid aside.

In order to prosecute celestial photography successfully there must be, in close contiguity with the telescope, a photographic room, abundantly supplied with both common and rain water. The water-taps should project over a sink, so as to reach about a foot from the wall. The rain water is conveniently kept in and filtered by an ordinary stone-ware filter. The photographic room may be lighted generally by means of an ordinary Argand reading lamp, over the shade of which hangs a lantern-like curtain made of two thicknesses of deep-yellow calico; but the plate, during the development of the picture, must be illuminated locally by a night-light before which a yellow screen is placed. The photographic room should be furnished with a stove, burning wood or charcoal, which will keep alight for a long time, in order that its temperature may never fall much below 50° F. during the winter.

In my earlier experiments, the positive process was invariably employed on account of its greater rapidity; but so many details, visible by transmitted light in a positive, are lost when it is afterwards viewed by reflected light, that endeavours were made to render the negative process equally rapid. After many trials, I succeeded in this; and I now never have recourse to the positive process, except for some special object.

Glass used.—It is of course necessary to have the plate somewhat larger than the object to be taken; the size used when the telescope is employed as a Newtonian is 2⅝ inches by 3⅛ inches. When the pictures are taken by the direct method, the plates are circular, and 2⅝ inches in diameter. The outside diameter of the slide to contain the circular plate is 3¼ inches, the exact size of the cell of the diagonal mirror, so that no more light is stopped out by the plate-holder than by the small mirror.

The glass used is the "extra white patent plate," and I have it selected as free from specks and bubbles as possible, but nevertheless I have frequently to reject about one-third of those discs which are supplied to me.

Mode of Cleaning the Plate.—The glass is cleaned in the ordinary way by means of tripoli powder, mixed up with three parts of spirit of wine and one of liquid ammonia, to the consistence of cream. For drying the plates I am provided with *two** cloths, which, in the first instance, have been carefully washed with soda (avoiding the use of soap), and repeatedly rinsed in water. Each time after being used, these cloths are thoroughly dried, but they need not be washed for months together. For the final wiping of the plate a piece of wash-leather is employed, also carefully dried before being used.

A piece of grit-stone, such as is used by mowers to sharpen scythes, must be at hand, for the purpose of grinding the edges of the glass plate and making scratches on the margin of the two surfaces, in order to cause the more perfect adherence of the collodion.

The plate to be cleaned is placed on a sheet of cartridge paper, and rubbed thoroughly, first on one side, then on the other, with a piece of *new* cotton-wool moistened with the tripoli mixture, above described. It is then washed in a stream of water, the fingers being used, if necessary, to aid in removing the adhering tripoli. Holding the plate while still wet, and without touching the surface, one edge after the other is rubbed on the grit-stone; the glass imbeds itself in the friable stone, and thus the borders of the two surfaces get scratched, and the edge is ground at the same time. After the four edges have been so ground, or, if the plate be circular, the whole periphery has been rubbed, the hands and plate are well washed, to remove all grit, and the plate placed edgewise for a few seconds on a marble slab. With dry hands, I take up the plate by the edge, being now very careful not to touch the surface with the hand, and wipe it, first with one cloth, then thoroughly dry with the second, and lastly, rub both surfaces at the same time with the dry wash-leather. I afterwards breathe on each side of the plate, to ascertain whether it is clean, wipe off the condensed moisture and place the plate in a grooved box, with the bust surface turned to face a marked end of the box, so as to know on which side to pour the collodion. Proceeding in the above-described manner, I have never any failure attributable to a dirty plate, and can feel certain of obtaining four or five good pictures of the moon out of about seven plates generally used. I am usually, however, provided with one or two dozen clean plates, for it is desirable to have a sufficient reserve, and experience has proved that plates so cleaned may be used even after a week, if the box containing them be kept in a dry room.

The Bath.—It is of the utmost importance that the nitrate of silver bath should be in the most sensitive condition; the rapidity of the process appears to depend in a great measure on its not being in the slightest degree acid, but as nearly neutral as possible. It is almost needless to add that, for such a refined application of photography as that under consideration, the solution should be kept in glass in preference to gutta-percha. The vessel must be carefully covered, to exclude dust, and, from time to time, the solution should be filtered through pure filtering paper (Swedish paper). The nitrate of silver used in the preparation of the bath is invariably fused in my own laboratory, in quantities never exceeding a drachm at one time, the requisite heat being gradually applied, and care being taken not to raise the temperature higher than is necessary to effect the fusion.

The solution I employ is the ordinary one of thirty grains of nitrate of silver to the ounce of water, with a quarter of a grain of iodide of potassium. In the preparation of a bath, after the mixing of the nitrate of silver, dissolved in a small portion of the water, with the solution of iodide of potassium, it is customary to add the remaining chief bulk of water, which causes an immediate precipitation of iodide of silver, and then to filter the liquid after the lapse of half an hour. It is, however, advisable to agitate the solution from time to time, during several hours before it is filtered; for unless this is done, the bath does not become thoroughly saturated with iodide of silver, and has a tendency for some time to dissolve a portion of the iodide of silver which first forms in collodion immersed in it.

* It is disadvantageous to employ more cloths than are absolutely necessary

I avoid adding alcohol or acetic acid to the bath, for these substances impair its sensitiveness. As, after use for a certain time, the bath becomes charged with more or less alcohol and ether, and their products of oxidation, its properties become changed, and a picture cannot be taken with it with sufficient rapidity; when I find this to occur, I discard the bath and make a fresh one. The bath, in its most sensitive state, usually exhibits a very feeble alkaline reaction with reddened litmus paper, and if it be found to have a tendency to fog, it is corrected in this way:—A single drop of pure nitric acid is taken on the point of a glass rod, and mixed with a drachm of distilled water; with this diluted acid (1 to 60) I moisten the point of the glass rod and stir it about well in the bath, which contains about fourteen fluid ounces of solution, and make a trial. If it still fogs, the acidification is repeated; and thus, after several trials, the fault is corrected. It is better to proceed in this manner than to rely on litmus papers as a test for neutrality; the object being to retain the bath in as sensitive a state as possible, the test by light is the only one to be ultimately depended on.

Moist hydrated oxide of silver may be used to bring back a bath which has become acid by use to a neutral state, and by the subsequent careful addition of dilute nitric acid it may be made to work; but all additions of acetate of soda, carbonate of soda, or acetic acid, are quite inefficacious for correcting a bath that does not work satisfactorily. In order to obtain the extreme point of sensitiveness, the best plan on the whole is to make a new bath; the silver being, as is well known, easily recoverable from its solutions and in part, by evaporation and crystallisation, as nitrate.

(*To be continued.*)

ON FIXING POSITIVE PROOFS.*

By MM. Davanne and Girard.

The study of positive proofs presents so much complexity that the chemist cannot hope to include in one view the different peculiarities of that important operation. Besides, he is in fear that some accessory phenomena may disguise reactions of the greatest importance, and lead to erroneous conclusions. Influenced by this kind of experience, based upon certain experiments, we introduced into our last memoir some conclusions which it is necessary to modify.

Whilst preoccupied with the rapid decomposition which affects the hyposulphite bath, we fixed the limit of saturation at too low a point. This conclusion, derived from experiments erroneously interpreted, must be immediately modified; and if the limit of saturation of hyposulphite could cause the fading of proofs, other causes arise at the same time, the examination of which, though as yet overlooked, demand our greatest attention.

In fact, we may say that, besides the substances which we have already pointed out, we also meet with a certain quantity of free nitric acid, of which it is as easy to prove its origin as to demonstrate its presence. We know that chloride of silver, reduced by light, sets free chlorine, which, reacting on an equivalent quantity of free nitrate, again forms chloride of silver, whilst at the same time it sets free the nitric acid which the silver was combined with. It is to the successive reactions thus produced that the depth of the photographic image is due. Besides, it is easy to show evidence of the existence of this free acid. It is sufficient for this purpose to take a sheet of positive paper, prepared in the ordinary manner, divide it, expose one half to the full action of the sun, and keep the other half in darkness, and examine the nature of the soluble products which pertain to each piece. If each be immersed in a small quantity of water, and tincture of litmus be added to each of the filtered liquids, we may easily recognise, by the red colour which the reagent assumes, that the solarised sheet contains free nitric acid; whilst the portion protected from light shows, by the same experiment, that the paper contained no acid before it was exposed to the action of the sun. Doubtless washing the proofs in water removes the greater part; but the decomposing energy of this agent upon one of the commonest fixing solutions —viz., hyposulphite of soda—is such, that it appears more prudent, as will soon be shown, to employ in all cases a weak alkali to saturate the minute quantity of acid that resists the action of water.

We will now refer to the fixing itself, and give especial attention to the hyposulphite of soda, as the action of ammonia, as well as that of cyanide of potassium, is well known through our previous researches.

* Continued from page 162 of the present volume.

On fixing a proof by means of a fresh bath of hyposulphite of soda, experience demonstrates that the fixing is perfect, and analysis shows that *the fixing solution has not imparted to the proof any substance that can change it, either immediately or hereafter.* But this result, so clear and precise, is modified in a troublesome manner in a certain number of cases, which may all be referred to four distinct causes:—

1. The presence of free nitric acid in the darkened proof.
2. The limit of saturation of hyposulphite of soda by the salts of silver.
3. The action of light.
4. The employment of baths charged intentionally with acids, such as acetic acid.

PRESENCE OF NITRIC ACID.—As already established, the exposed sheet, on being removed from the frame, contains a certain quantity of nitric acid. It is easy to foresee the influence which would be exercised on the solution of hyposulphite of soda on contact with the acid. The reaction is thus indicated—

$$S^2 O^2, Na O + N O^5 = N O^5 Na O + S O^2 + S.$$

The nitric acid decomposed, the hyposulphite saturates the soda, and sets free hyposulphurous acid; but the latter, whose instability is well known, is immediately resolved into sulphurous acid and sulphur. The first of these bodies is without influence, but it is not so with the second; precipitated within the interstices of the paper, it carries with it an element of destruction, which, if it does not act immediately, nevertheless combines before long with the silver to form that yellow compound, that golden sulphide, whereof our former experiments have established the part it plays in the destruction of proofs.

The presence of free nitric acid in the darkened sheet, the energetic action which it exercises on the hyposulphite, demands from the photographer fresh precautions. Habituated hitherto to wash his proofs on their removal from the frame, to remove the excess of nitrate of silver that it may be recovered (of which excellent proceeding we shall soon show the efficacy), it is also necessary that he should submit them to the action of a substance capable of saturating the free acid which the water has not entirely removed. Bicarbonate of soda offers itself as the best reagent to effect this result. It is to this, in fact, that photographers will have recourse to avoid the new danger that we have pointed out. After having washed their proofs in water, so as to remove all free nitrate, it will suffice to let them rest some minutes in an aqueous solution of bicarbonate of soda of two or three per cent., or this may be more simply effected by adding the alkali in this proportion to the hyposulphite bath. Saturated in this manner, at the same moment the liquid penetrates the sheet the nitric acid can no longer exercise a destructive action upon the image.

LIMIT OF SATURATION OF THE HYPOSULPHITE.—We now attack the most complex and delicate part of the question that occupies our attention. Every photographer knows that when with precaution we throw a certain quantity of solution of nitrate of silver in a solution of hyposulphite of soda a white precipitate appears, which is immediately dissolved. This precipitate is hyposulphite of silver, $Ag\,O, S^2O^2$. It is a very unstable body, insoluble in water, and immediately it presents itself in the solid state is decomposed into sulphide of silver and sulphuric acid, according to the formula—

$$(a) \qquad Ag\,O, S^2O^2 + HO = Ag\,S + SO^3, HO.$$

This body can combine with hyposulphite of soda (as occurs when it is dissolved in it), and gives rise to two salts having very different properties. The one that first forms is when the hyposulphite is in excess, and corresponds to the formula—

$$(Ag\,O, S^2O^2) \quad (Na\,O, S^2O^2)\,2.$$

It is a white salt, very soluble in water, unalterable by the action of light, and can only be obtained in the crystalline state by precipitation from its aqueous solution by alcohol.

The second is formed when the hyposulphite of soda is in a relatively less quantity than the nitrate of silver, and corresponds to the formula—

$$Ag\,O, S^2O_2, \; Na\,O, S^2O^2.$$

It is a white salt, crystallising in magnificent prisms possessing the greatest brilliancy: it is nearly insoluble in water, undecomposable by light when in the dry state, but decomposing with extreme facility under its influence when in contact with water, and then giving rise to sulphide of silver, corresponding to the reaction *(a)*. The same compounds may be obtained by shaking recently precipitated chloride of silver in a solution of hyposulphite of soda.

(To be continued.)

NEW FORMULA FOR TONING BATH.

By M. l'Abbé LABORDE.

I HAVE tried nearly all the formulæ proposed for fixing and toning positive proofs by chloride of gold. Without attempting to discuss their merits or demerits, I shall content myself with making known a process to which I give the preference, because I have always found it the simplest and surest.

Dissolve in	Water	35 ounces.
	Acetate of soda	$7\frac{1}{2}$ drachms.
	Chloride of gold	15 grains.

The solution becomes colourless by degrees, and at the expiration of twenty-four hours it is ready for use. On removing the positive from the printing-frame it is washed in two or three waters, to remove the free nitrate of silver; it is then immersed in the gold bath, where it must be allowed to remain not more than twenty-five to thirty seconds, when the bath is first used. The action of this bath is stopped by putting the proof in water and rinsing it, then fix it as usual in hyposulphite of soda.

If the gold bath has been used before, its action is slower. Experience will enable the operator to see by the successive changes in tone the proof assumes when he should remove it from the bath. If it be removed too soon, the proof assumes a disagreeable red hue after it is fixed with the hypo.; on the other hand, if it be allowed to remain too long in the gold bath the proof assumes a cold blue tint. Between these two extremes there are a variety of tones of sepia and of violet, which can be secured by removing the proof at the proper moment. In proportion to the length of time the gold bath has been used so we must prolong the toning, until the required tint appears. The strength of the gold bath can be restored by adding fresh chloride of gold; but before making the addition we must take care that the solution is nearly colourless, for if the chloride of gold is not in combination it will, like other chlorides, weaken the proof.

STEREOGRAPHS.

Reminiscences of Scottish Scenes, by W. WOODWARD, *of Nottingham.*

IT is not long back that, in criticising a series of stereographs by Mr. Rodger, we remarked upon the irresistible desire evinced by every photographer to whom the occasion might offer of possessing himself of a record of the local features presented by the residence of the far-famed novelist, Sir Walter Scott. In this respect Mr. Woodward forms no exception; and first among the series now before us we notice—

ABBOTSFORD (No. 151), *from the South-East*—of which, by the way, there are two slides, and both bearing the same name and number. Mr. Rodger presented us with the front of the edifice, as seen from across the Tweed; Mr. Woodward treats us to a peep "behind the scenes," so that from an elevated terrace of mossy turf we overlook the grounds and inspect the beauties through the spring-clad branches of a few tastefully-disposed trees which half conceal them like the veil on the head of a blushing bride. As a background to the edifice itself (which is somewhat of a castellated structure), the undulating outline of a ridge of hills beyond the opposite bank of the river forms an appropriate contrast to the geometrical lines of the building, while in the immediate foreground in one of the slides the graceful form of a fine silver birch-tree is particularly noticeable, a feature that of itself will render this slide a favourite. But as an illustration of the aspect of Abbotsford itself we prefer the other specimen, taken from a somewhat different point of view—that one in which the scaly stem of a Scotch fir-tree is seen on the right hand, and a sapling sycamore in the centre. In this one the spectator overlooks the garden and outbuilding, and, being a trifle more distant, obtains a better general view of the whole place. It is a particularly pleasing and well-executed specimen of the artist's skill.

From his residence while living to his resting-place in the tomb is a natural transition; and in the Dryburgh Abbey series we find THE TOMB OF SIR WALTER SCOTT (No. 152), which, beyond the association, has no feature of special interest; for, though perfectly executed, it would be next to impossible to invest a very plain angular tomb, seen through a pair of ordinary iron gates, with any approach to the picturesque. In No. 153, however (ST. MARY'S AISLE, DRYBURGH ABBEY), the angle of the building in which the tomb is located, the case is somewhat different; and the contrast of the deep shadows under the arches with the dilapidated stonework of the pillars illuminated by the blaze of bright sunshine, relieved by the half-tones produced by the various mouldings, is very effective.

For picturesqueness and stereoscopic excellence, however, No. 157 far surpasses the preceding. It is the same subject (St. Mary's Aisle seen through the Door of the Cloister Court), the doorway being a mere ruin, partly overgrown with ivy, and choked with thistles, foxgloves, and other vegetable "vagabonds." This would form an admirable study for a large painting.

No. 154, East End (Interior), seems to be labelled rather jocosely. It is a low wall, on which a couple of monumental inscriptions can be discerned, and a mere fragment of some elaborate piece of sculpture. Rank grass forms the flooring, and trees and shrubs more than half of the background of this *interior!*

An avenue of trees looking towards the nave would have been better if the exposure had been more prolonged; and No. 158 (The Refectory Window, Dryburgh Abbey), an admirable subject, has been to some extent spoilt by over-development, the foliage of the trees in the foreground being spotty and snowy. This is a great pity, for in other respects the slide is an excellent and pleasing one.

Kelso Abbey, from the east, is another of the time-honoured ruins of which there are so many of the class in Scotland. The point of view from which the specimen before us is taken is a happy one, and the circumstances under which the exposure took place must have been favourable, for the perfect definition of the foliage of some trees in the foreground indicates a state of repose only possible under a total absence of that enemy of the landscape photographer—a breeze.

Melrose Abbey, like Abbotsford, finds much favour amongst the whole band of photographers; and deservedly so, for a more picturesque ruin it would be difficult to meet with. We consequently find it under many different aspects, from several points of the compass, interiors and exteriors. Perhaps, by the way, this is one reason why we find it so frequently taken; it affords so many different pictures, and all more or less good. In the slide now before us, taken from the south-east, a good general view of the whole edifice is included, and in which the south window and east window (both favourite subjects for interiors) are well seen.

No. 144 (South Aisle and West Window of Melrose Abbey) appears to us named upon the *lucus a non lucendo* principle, for there is neither an aisle or a window, properly so called, to be seen. The mere extremity of a window is rather indicated than seen in the distance, and the extreme corner of the aisle is all that represents it; but the slide is a very nice one for all that, and likely to be a favourite. *(To be continued.)*

Letters to a Photographic Friend.

No. III.

My dear Frank,

On resuming my photographic pilgrimage, on the second day, I turned my steps towards Mr. Skaife's Pistolgraph Depôt, at 47, Baker Street, where he has opened classes for instruction in Instantaneous Photography, and an operating-room for taking instantaneous portraits. His method is particularly applicable for taking portraits of children, aged persons, and animals, as, by means of his spring shutters, the time of exposure is *completely* under control, which is not the case with any other instantaneous arrangement I am acquainted with: all others are *entirely dependent* upon the action of springs, released by a trigger, and the shutters carrying the apertures must pass through a certain regular course of mechanical motion of greater or less rapidity, governed in amount by the strength of the spring employed, and *the amount of exposure* given *must*, in these instruments, *be preconcerted.* This is not the case with Mr. Skaife's invention; for, though he can employ a mechanical trigger to act upon the arrangements that open and close the shutters, the tip of the finger can be substituted, and any amount of exposure given, instantaneous or prolonged, according to the judgment of the operator: thus, in taking the photograph of a child or animal, on the slightest indication of motion being about to affect the subject, the tip of the finger is raised, and the plate is *simultaneously* protected from the action of light. In this case *the will* of the operator governs the amount of exposure, and not simply a mechanical power.

This invention is quite independent of the instrument which Mr. Skaife calls a pistolgraph, for which it was originally contrived, and may be arranged for a single or twin lens camera for taking instantaneous or other stereographs. If you wish to refresh your memory as to the construction of these shutters, you will find a description of them, given by Mr. Shadbolt, in the number for October 1st, 1858, of *The Liverpool and Manchester Photographic Journal.* What Mr. Skaife calls his chromo-crystal portraits are positive collodion photographs, taken by his Lilliputian Camera, and then backed up with deep blue or ruby-coloured glass. As the collodion film is cemented or fused between these glasses, they may be regarded as indestructible as far as the action of the air or rubbing is concerned. They vary in size from one and a-half inches to three-eighths of an inch in diameter after they are trimmed by the lapidary. They are the neatest and best-executed portraits I have seen suitable for mounting in bracelets, brooches, pins, or rings. An instantaneous view, taken on the day of my visit, delineated a vista of houses down Baker Street, a Hansom cab progressing onwards, with a boy and man in the act of running out of its way. The uplifted legs of these figures were sharply defined, without *the slightest trace* of any blur, so common in such subjects.

I spent some time in examining Mr. Skaife's interesting collection of portraits of well-known persons, equestrian groups in the Parks, boating scenes on the Thames, animals, &c., together with some enlarged views on paper produced from some of these.

From Baker Street to Duke Street, Manchester Square, is but a step, and here Mr. Hockin's warehouse naturally fell within my route. Mr. Hockin introduced to my notice a handy little camera for dry plates, fitted with twin lenses, *in situ*, and six double slides in the belly of the instrument. Hinged doors shut in both ends under lock and key, and thus the framework forms the packing case for all things necessary on a tour; in fact, it is just the kind of thing one could send down to any intelligent country friend unacquainted with the mysteries of photography, and with a few simple instructions he might bag some of the tit-bits of his district, and send them up by rail for you to develop at your leisure. In this way many an otherwise unattainable view might be secured for the stereographic scrap book; and, as with some collodions and dry processes over-exposure is hardly attainable — at any rate within the limits of reasonable attention to instructions— failures in this way need hardly be anticipated. Mr. Hockin's travelling cases are very compact in their arrangement, and contain cameras, slides, legs, printing frames, and all the materials an amateur is likely to require, whether *en route* or resident in country or town. To accompany these cases a dark tent has been recently perfected, to be used at home or abroad. It consists of a tray into which the bath packs; in front of it a portion is divisioned off for a series of square bottles that contain all chemicals required in the field; an aperture at the left hand side, with a pocket attached, receives the nitrate bath when at work; to the two sides are hinged open-railed frames both of *the same size* as the bottom tray; and on the third side, facing the operator, is hinged a solid board containing a yellow glass window, guarded by a shutter and a light-tight door which can be opened either to admit light or air, as occasion may require: these three slides mutually support each other when in use, as well as the black cloth that forms the tent. This frame-work is fixed on a tripod stand. When done with, first one frame is shut down, then the opposite one over it, and lastly the solid back closes down on all and protects everything. The tent then occupies the space of a moderate-sized carpet-bag.—An ingenious invention next claimed my attention, in the shape of a slide for instantaneous exposures, and applicable to single or twin lens cameras. For stereoscopic cameras two oblong brass plates, with two diamond-shaped apertures in each, overlap each other in such a manner that when in a state of rest both apertures in each plate are closed. The two plates glide over each other in a groove common to both, and lie on a base-board, pierced at one end with two circular openings, corresponding with two caps that fit over the lenses. At the other end of the base-board a small wheel works on a pinion; three spokes divide it into three parts. On rotating the wheel, by means of a projecting handle, two pins, placed diagonally at the circumference, begin to act upon slots in the end of each shutter, so that as the wheel is rotated the pins force the shutters apart in opposite directions, till at a certain point the apertures in each shutter coincide; but on continuing the rotation of the wheel till the handle has passed over one-third of the circumference, the two apertures are again closed, and a trigger falling into a notch retains the wheel in position till the operator is ready to expose the plate. To the left-hand side of the base-board one end of a vulcanised india-rubber spring band is fixed in a clamp screw or small vice; the other end is just drawn tight and fixed in another minature vice attached to the circumference of the wheel when at rest. On rotating the wheel the spring cord is extended, carried round with the wheel, and then lies in a groove in its circumference. On the operator wishing to expose the plate he releases the

trigger, the india-rubber spring re-acts and pulls the wheel back to its original position; of course the action of the shutters are then reversed, and at a certain point the two diamond-shaped apertures again correspond, and admit the rays of light emanating from the object to the two halves of the stereographic plate; but instantaneously passing over each other the light is cut off and the exposure completed. By clamping the spring cord at various points of tension a greater or less amount of rapidity of action is obtained. I obtained a copy of Mr. Hockin's recently-published *Practical Hints on Photography;* and from subsequent examination of its contents I can safely say it is worthy of its title, in face of the *ex-cathedra* (Dissenting !) objection of the "WEEKLY ANNIHILATOR" to its opening passage, and the attempt *(literally)* to "shut up" this useful little volume, wherein the reviewer might have opened up *untold* treasures if he had been photographer enough to recognise them when they came under his eye. But the *critique* looks very like a modern edition of the fox turning up his nose at grapes that were not within his power to digest.

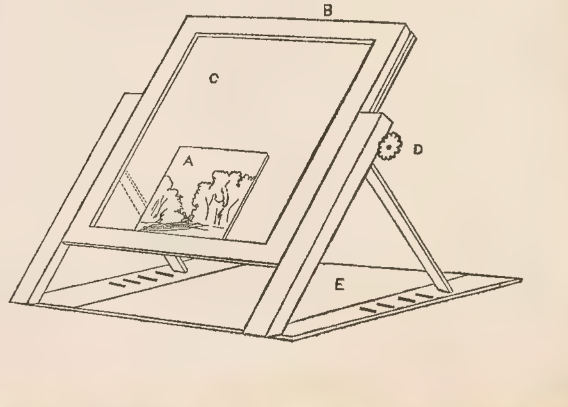
After leaving Hockin's I called at Messrs. Hopkin & Williams's, the manufacturing chemists, of New Cavendish Street, to obtain a supply of some pure chemicals I required, but I certainly did not expect to come across any photographic novelties; however I stumbled upon *a fact* which, "as found," according to Captain Cuttle's advice, I "make a note on." On expressing my surprise that they, as wholesale dealers, were charging a higher price for re-crystallised nitrate of silver than that at which this article had been offered to me by a retail house, it called forth the following explanation:—Whilst there was only an unimportant demand for the re-crystallised article they obtained their supply from other quarters; but lately they had reason for re-crystallising this salt in their own laboratory, and they were rather astonished at the result of their first and subsequent experiments, for, on re-crystallising 200 ounces of commercial nitrate of silver, they could only obtain 150 ounces suitable for photographic purposes, and the remaining fifty ounces, when obtained from the mother liquor, proved to be an almost unsaleable article. The mode of procedure and the results were as follows:—200 ounces of ordinary crystallised nitrate of silver, white and pure in aspect, were fused in a porcelain vessel at the lowest possible temperature, to avoid decomposition of the salt; the fused mass was then dissolved in distilled water, filtered, and two drachms of pure nitric acid added; for the solution, as first obtained, is alkaline, and would yield crystals quite dark in colour when dry, which, from their aspect, would be perfectly unsaleable. The amount of acid stated is the smallest quantity that will correct this defect. The solution is then gently evaporated, and, on cooling, yields crystals *rather small in size, very white*, but both *in tint* and *pearliness* of aspect *decidedly different in character* from the re-crystallised nitrate of silver we ordinarily obtain, as I can testify to from personal examination. After about 150 ounces of these pure crystals have been obtained a change occurs, the mother liquor begins to assume a greenish aspect, and to yield crystals of a tawny colour when dry; if it be then evaporated down to dryness the residue is distinctly green, and in parts impregnated with brown patches, and presents such an appearance that no photographer and few chemists or manufacturers would feel disposed to purchase it. On making a solution of this residue in distilled water, and adding excess of ammonia, the oxide was not precipitated and then re-dissolved, leaving a colourless solution (as would be the case with pure nitrate of silver), but the solution remained permanently dark coloured. It is thus evident that the commercial crystallised nitrate of silver is anything but the pure article it has been asserted to be; and the impurities it contains (though difficult to detect when testing on the small scale) are sufficient to account for many of the imperfections that have assailed the sensitised collodion film in the shape of marbling, fogging, &c.

If, in preparing re-crystallised nitrate of silver, it is necessary to sacrifice one-fourth of the ordinary crystallised salt employed in the operation, one can readily understand why it should be rather a costly product; but considering the moderate price at which it *has been* offered to the public, and the great difference in aspect between the assumed and *the known* genuine article, a strong suspicion arises that much of the "re-crystallised" salt sent into the market has been obtained by the simple operation of picking out the whiter, larger, and better-formed crystals from ordinary nitrate of silver. I am inclined to agree with a statement made one evening at the Society of Arts by a lecturer *On the Microscope*, that "there are few manufacturers who are not guilty of *adultery*," although the speaker immediately modified this assertion. I question whether the class thus stigmatised have modified their improper practices since that evening.

At Shew's, in Oxford Street, I was amused with the ingenuity displayed in the "getting-up" of some French stereographs, entitled "Satanic Slides," which represent ideal scenes of "high life below stairs;" such, for instance, as the arrival of a railway train from the realms above, filled with skeletons, who, from the expression of their fleshless visages, are evidently taking (shall I say) a *lively* interest in the *point de vue* of their destination, whilst a demon, of huge stature, in a green uniform of hair, acts as guard, *un diable rouge* as stoker, and *un gamin* perambulates the platform with *La Gazette d'Enfer* under his arm, and cries the latest news of these tropical regions. Then, again, there are such scenes as "*Les Vendages en Enfer*," "*Bal chez Satan*"—with a ghastly band in skeleton-suits playing an accompaniment to the dancers, but where the wind necessary for the proper performance of their instruments comes from is a question as difficult to solve as is that whether cherubims, as figured on ancient gravestones, are accustomed to sit on their heads or their tails—"*Marriage de Satan*," &c. In contrast with such agreeable views of this subject, there are renderings of "*Enfer*," "*Purgatoire*," together with *The Temptation of Saint Anthony*, &c. This series of stereographs is thoroughly French in conception, and will amuse those who delight in the *diablerie* of such scenes as are delineated by Retsch, of *The Witches Meeting on the Brocken*, *The Place of Execution*, &c., in his outline illustrations to "Faust." Their peculiarity, apart from the subjects selected, is the vigour and perfect ease that pervades the figures, and the expression thrown into the features of such unyielding models; whilst the composition of most of the groups is thoroughly artistic, and contrasts wonderfully with the namby-pamby figure-subjects that occupy too much space in our shop windows, and that carry on their face painful evidence of the models being thoroughly aware that they were going to be executed—stereographically.

Burke and Carter, the photographic mounters, Oxford Street, near Dean Street, have brought out a very neat form of passe-partout, made up with shagreen paper of various tints, and covered in with a very white glass that is supplied to them by Messrs. Chance, of Birmingham. If you want any of your photographs mounted in this style, I can recommend this pattern to your consideration, as I can also the portfolios constructed especially for photographs by Mr. Harvey, of 16, Rathbone Place. These have the flaps so made that they not only effectually keep out dust, but also completely protect the corners of the mounting boards from injury. Any photograph within may be placed under the guardianship of a good lock, the tongue of which forms a rest when the portfolio is open, so that the collection may be placed before the inspector as if inclined upon an easel, and the flaps are then folded back quite out of the way. This is not only a useful but an elegant contrivance, and durable withal, and is deserving of being more thoroughly known amongst photographers and artists.

Whilst in Rathbone Place I ordered an inclinable rack of Messrs. Winsor and Newton, which they brought out as a rest whereon to support glasses whilst being painted for magic-lantern views. *I* intend, however, to use mine as an easel for negatives that require "*touching*;" so I have had it made to take a plate twelve by ten. As the instrument takes less time to figure than describe, I give you a sketch of it, from which you will readily understand its construction, if I state that the frame B is filled up with a sheet of glass C, on which the negative A rests, and may be viewed as a transparency, whilst pin holes, &c., are being touched out; that the frame is adjusted higher or lower by means of a rack and pinion D; and that the instrument folds up flat when out of use.



As I cannot find time to tell you what came under my notice at the other houses I visited on this day, I must wait till I next write to you. I can only say that, on concluding my second day's voyage of discovery, I wended my way wearily towards the heart of the metropolis, determined to take "mine ease in mine inn," and that night I slept soundly, in spite of rumbling market carts assembling at early morning in the square below my window—in spite of the hubbub that characterises a London market meeting "in the morning early," so that, suddenly waking, one does not know whether a fire or a row is raging—in spite of a fellow-*inn*-mate, who came up with the early hot water, insisting on claiming my room door as his own till taken in tow by "boots"—and last, not least, in spite of endless dreams of binocular cameras on legs of inconceivable length, firing pistolgraphs at chromo-crystallised cats, flying at small boys just running under the wheels of a perambulating Hansom's tent, driven by a shabby man, who threatened to drink my health out of a patent collodion pourer, if I did'nt have my likeness taken for fourpence, on a plate prepared in a bath of recrystallised nitrate of silver, which in my helplessness I submitted to, when all his ghastly positive specimen portraits suddenly changed into "Satanic" skulls, who to my horror hooted the demon's chorus in *Roberto il Diavalo* at me during the whole operation, which was conducted by a very red devil, with a pig's head and a Cobra di capella tail, with a Harvey's patent portfolio under his arm, in which he evidently intended to lock up my shadow after the manner of Peter Schlemmel's—through all this I slept the sleep of the weary, and blessed my stars for the same, and cursed the chamber-maid *(horribile dictu)* when she called me at nine on the following morning. So, after a well appreciated breakfast, and doing my duty to my neighbour—that is to say, keeping my promise in writing to you,

I remain, Yours sincerely,

SIMEON HEADSMAN.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A meeting of the above Society was held on the 1st instant, at the Rooms of the Literary and Philosophical Society, 36, George Street, Manchester,—Joseph Sidebotham, Esq., presiding.

Mr. Michael Noton was unanimously elected a member of the Society.

Mr. Samuel Cottam presented to the Society's portfolio six stereoscopic views in Oxford, mounted on one sheet, taken by himself on Dr. Hill Norris's dry collodion plates. He said he thought it might be interesting to the members to know that two of the plates had been in his possession about twelve months, and the results were equal to the others, which had only been recently purchased. He could not say the same of all the lot which were a year old; but that was probably owing to faults in exposure and development on his part. He was glad, then, to bear testimony to the keeping qualities of these plates.

Mr. A. Brothers exhibited a portrait on ivory, printed without nitrate of silver, and fixed without hypo. He said the process was at present a secret, and would remain so for three years, excepting to those who would pay £10.

Mr. Rogerson exhibited several very large pictures—23 by 18 in.—taken by the turpentine waxed-paper process, which were very much admired, being remarkably sharp, and full of half-tone and force.

Mr. Hooper presented four very beautiful waxed-paper pictures to the Society's portfolio, which were also greatly admired.

The Chairman said that the attention of the members would now be called to a correspondence which had taken place in reference to the alleged interference of Mr. J. L. Davies with the exhibition pictures in Peel Park. The Secretary would read that correspondence, and would also lay before the meeting a report on the subject, drawn up by a committee appointed by the council. He much regretted that so unpleasant a business should have occupied the attention of the members; but the question was really so important, and the charge it involved against one of their body so serious, that it was impossible to avoid the discussion. He trusted, however, that that evening would end it.

The Secretary then read the correspondence, which was very lengthy.

[Mr. Davies's letters, in which he denies the charge, appear in another column, as communicated by him, and do not, therefore, require insertion in this place.]

A communication from Mr. Plant, the Curator of the Museum, stated that Mr. Davies applied to him to have certain pictures removed and his own substituted; and that, in deference to his father's position, he had agreed to it, not thinking it a matter of any importance.

The following is an abstract of the report presented by the committee:—

That Mr. J. L. Davies used undue influence, in the first instance, to enter his pictures for exhibition without submitting them to the committee appointed by this Society, under whose sole responsibility and control the Exhibition room was placed by Mr. Plant.

That the committee having hung the pictures, Mr. Davies caused several of them to be taken down and replaced by his own.

That Mr. Davies has, in the hearing of members of this Society, boasted that he did so. Upon such conduct this committee would have advised the severest censure; but as Mr. Davies has tendered his resignation, its acceptance is recommended.

The report was then put and carried unanimously, and the Secretary instructed to strike Mr. Davies's name from the list of members.

The Chairman then called upon Mr. Mann to read the paper which he had promised. [See page 232.]

Numerous negatives and prints, by the process, were shown to the members, and were much admired.

The Chairman: The paper which we have just heard read is one that must not only have taken us by surprise, but must have afforded us a field for thought and for experiment of a most interesting and profitable character. We have heard a statement of facts, and have seen them corroborated by results which are entirely new to us. The gentlemen who have pursued these experiments have most modestly declined putting forward a claim to a completed process. They state that what they have done must be taken only as something from which more may arise; but I think that no one can look at the negatives on the table without being persuaded that the new method is capable of producing most beautiful results, even in its present state, and that we may reasonably hope for uniformity of action. If there were no other advantage attendant upon this process over the ordinary collodio-albumen, the banishment of the aceto-nitrate bath would effect a most important improvement. The ever uncertain condition of that agent is a great evil, besides the additional expense and trouble it involves. Having been favoured with a description of this process some days since, I prepared two plates, and here are the negatives taken upon them. One of these, before the washing (or as it must now be called sensitising), was placed against a window, in full sunshine, for two or three hours—a test that proves most decidedly the assertion of the discoverers, that in the first stage the prepared surface is quite insensitive to light, and that the washing in water imparts that quality. I notice, however, one remarkable fact, that the picture appears to pass through the albumen, for it may be rubbed off, as you see, without disturbing the film.

A Member: Is not the albumen removed by the washing?

The Chairman: No, it can be seen that it is not so, the reason being that the albumen is coagulated, but perhaps not perfectly, by the heat with which it is dried.

Mr. Mann: The Chairman has observed that the image may be removed by rubbing without disturbing the film: I have not found it to be so on the plates that I have used, and I submit that the effect is due to a certain description of collodion.

Mr. Cottam: Here are two negatives taken by this process; the plates were prepared under difficulties, but it will be seen that the defects do not belong to the process.

Mr. Mabley: I have seen the progress of the experiments which have been described to us this evening, and I must own that I was at first sceptical as to the results, but my doubts are in great part removed, and I think, as we must all hope, that a great improvement in the dry processes is in store for us. The facts, for such they are, which have been laid before us, even those in reference to the use of a chloride in the albumen, involve something perfectly new to us. It has been known for some time now that a plate was not destroyed in sensitiveness by the application of a chloride; but we did not know, and this it is which gives the process one great value, that the plate was insensitive while the chloride remained upon it, but might be rendered sensitive simply by washing in water. That is a most important and novel fact, but the treatment of a plate with an iodide in a similar manner is more surprising still; and I wish particularly to call attention to the fact that *paper* treated in this manner possesses quite an opposite quality. Paper prepared for the calotype is furnished, with the exception of the collodion and albumen, with just the same film of iodide of silver, for it has first of all an excess of the potassium salt which is removed by washing: if it obeyed the same law as these plates, it should by that washing be made sensitive, but it is well known that it may be submitted to any amount of light without injury.

Mr. Wardley: Papers so prepared are improved by the action of light, and I think we must assume that, in the process now brought before us, the albumen plays an important part; but that is a matter which must remain for investigation. There is one feature in the process we are now considering which deserves particular attention: it is the facility with which plates may be sensitised upon a journey. It is probable that this may not be of importance on keeping considerations; but there will be this advantage, that a sensitive surface, free from intrusive impurities, will be obtained, and those who are in the habit of travelling with photographic plates will appreciate this. I must differ from Mr. Mann in his statement that blisters may not be expected. I think that the film will be quite as likely to blister by treatment with water as with nitrate of silver.

Mr. Petschler: Mr. Mann's plates have been free from blisters, but I cannot say that of some of mine. They have assumed, however, a different character to those upon collodio-albumen plates; they have entirely disappeared when the film is dry, and do not again rise under development.

A Member: Will Mr. Petschler be kind enough to inform us how he was led to this discovery?

Mr. Petschler: It was in this manner:—I had for some time been experimenting with chlorides in the collodio-albumen process, and on one occasion dipped a plate into the bath of aceto-nitrate, which did not contain sufficient solution to cover it. On developing this picture I found that the portion which had not been covered by nitrate of silver developed much more quickly, and with greater intensity, than that which had been covered.

A Member: It was an accident, then.

Mr. Mabley: But followed out with much ingenuity.

Mr. Petschler: This led me to consider that as the part uncovered with silver solution should have been insensitive, according to received opinions, the acquisition of sensitiveness must have arisen from the removal of the salts from the albumen by the ordinary washing which the plate was subsequently submitted to; and that proved to be the case. After that it was necessary to discover which was the better salt, the iodide or the chloride, when used as Mr. Mann has described, and the latter, after repeated experiments, we adopted. Our time, however, having been insufficient for full experiments, we do not say that the iodide may not be found equally efficient.

The Chairman: There is an advantage in developing these plates which is very striking: you cannot discolour them by the solution. One of these I purposely attempted to stain by using pyrogallic acid completely black; but it is fully as clear and bright as the other, which was carefully developed with a clear solution.

A Member: Will Mr. Mann say what amount of washing is required to remove the salts from the albumen?

Mr. Mann: The plan I have adopted is to wash the plates under a tap for two or three minutes, but I do not say that washing to that extent is required.

The Chairman: My stereoscopic plates were merely washed in a dish containing a small quantity of water.

Mr. Mabley: Our attention has been called to a negative, one-half of which was submitted to a second sensitising, as in the Taupenot process, and the other half simply washed in water, and it is remarked that the latter is more fully developed. I submit that this is not of necessity due to inferior sensitiveness in the former, but may arise from the fact that the albumen on the portion treated with nitrate of silver is completely coagulated, and is therefore less pervious to the developing solution. I think it would be found that both portions could be equally brought out by prolonged development, although, perhaps, not without that muddy deposit which we frequently get in collodio-albumen: and therein lies a great advantage of this process.

A Member: Will Mr. Petschler be good enough to give the particulars of exposure of one of the negatives on the table?

Mr. Petschler: This negative, a mixed landscape, which it is agreed is fully exposed, was taken at half-past five in the evening in a good light. The lens was seventeen inches focus, with half-inch stop; the exposure twenty minutes.

The Chairman: Gentlemen, I think a vote of thanks is due to Messrs. Petschler and Mann for the paper given us this evening. I am sure we are greatly indebted to them for the matter they have brought before us, and I would suggest that during the next month all those who have the opportunity should follow up this process, and that the subject should be resumed at our next meeting.

Mr. Mabley: The facts which have been brought before us this evening add materially, I believe, to our photographic store. I am not acquainted with anything which has been given to our art for a long period which equals them in novelty and in prospect of useful application; and we may now hope that the editor of a certain photographic publication may discover that the Manchester Photographic Society is still in existence.

A vote of thanks was then passed by acclamation to Messrs. Mann and Petschler, and also to the Chairman.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

[In consequence of the large amount of space devoted to the reports on the Solar Eclipse, we are compelled to postpone the publication of the continuation of this article, and also some "Answers to Correspondents," till our next number.]

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

E. M. Tyrrell, Williamsburgh, L. I., New York.—There is much promise in your colouring: it is clean, bright, and natural; and your touch is of the right kind, but the drapery and hair are *very* badly executed. Hair is always transparent where it nears the flesh, partaking in its hues of the flesh-shadow colours, broken and softened with greys: it is *never* of one uniform tone of black, but owing to its glossy surface displays all the various modifications of colour arising therefrom. Now your hair comes to the flesh as opaque and black as the pure pigment can make it, instead of graduating from fleshy greys into the local colour softly and insensibly. Take a guide, and study to preserve in your coloured *fac-simile* all the softness of the photograph, remembering that the edges of the hair and flesh must so partake of each other's colour as to indicate the former's natural character. The drapery in your picture is one flat, opaque mass of black pigment, conveying no idea of anything but paint. Where the lights fall and where the shadows rest are of the same colour; the folds are all concealed; texture is completely destroyed, and such parts of the picture as are tolerably well done quite destroyed. I am gratified to know that I have pupils in the young country so closely connected with dear old England, but so very far away.

J. B., Rosalind, and one other pupil, are informed that their productions will be noticed in our next—the author, in consequence of absence from home, not having seen their specimens.

Foreign Correspondence.

Paris, August 11, 1860.

The photographic results obtained by the members of the French commission sent into Spain to observe the eclipse of the 18th of June are unfortunately very small. I will give you what MM. Le Verier and Léon Foucault say in the official report transmitted by those gentlemen to the Minister of Public Instruction.

"We set up equatorically an ordinary camera, provided with a double objective, with a wide opening and a short focus, and throwing upon the ground glass a solar image of great brilliancy. The apparatus was furnished with a finder, and was moved with the hand by means of a screw, so that, by keeping the sun upon the point where the threads of the eye-glass cross, we were enabled to maintain the image nearly motionless upon the screen of the camera. It was then merely necessary to substitute, for the ground glass, collodionised glass plates recently rendered sensitive, and to leave them exposed for a longer or shorter time to the action of the real image of the eclipsed luminary.

"Immediately after the disappearance of the last ray of direct light, the first plate was put into the focus, and exposed during ten seconds. It was then succeeded by another plate, which remained twenty seconds, and by a third sixty seconds. On leaving the bath, the three plates were treated with sulphate of iron and cyanide of potassium, in order to obtain *direct positives.* In the hurry of the manœuvres, the frame containing the first plate was displaced when the objective was already uncovered; several images were thus accidentally produced after a very short exposure, thereby bringing into the discussion valuable and unexpected elements. In some, on the three plates, six distinct images were obtained, of which three were formed after the exposure, which could not have exceeded a quarter of a second, while the three others are the results of an exposure of ten, twenty, and sixty seconds respectively.

"The three images formed in the fraction of a second, the moment after the sun's disappearance, do not offer a complete representation of the halo: they are reduced to the circumference of a circle surrounding the dark disc, and present variations of intensity which, three times repeated, cannot be attributed to the accident of manipulation. On the side on which interior contact had just taken place this circular outline shows increased intensity; besides, on the three images may be observed similarly situated irregularities, which seem to be an exaggerated representation of the irregularities of the lunar outline. When the image is again placed in the real position of the heavenly bodies, it is seen that among these denticulations there are two principal and contiguous ones at the lower and eastern extremity of a diameter of forty-five degrees of inclination.

"The other three pictures give to the halo an extension which increases with the duration of the exposure. This halo is shaded off outwards from the sun, and is lost, without line of demarcation, in the general tint representing the sky. In the picture which underwent the exposure of sixty seconds, the halo extends visibly to a distance equal to three times the radius of the central disc. But, in particular directions, the halo offers in its intensity positive and negative variations, which resemble the rays of a glory; one of these variations, more clearly marked than the others, is prolonged beyond the rest of the halo, and seems to emanate precisely from the point occupied by the denticulations already mentioned.

"Such are the facts resulting from an experiment in which the sole object proposed was the appreciation of the photogenic activity of the halo upon wet collodion. The agreement to be found in the six pictures furnishes positive elements for the discussion of the nature of the halo, which I hope to turn to account."

We thus see that the most useful data acquired by the observers are precisely those that were due to an accident — to the unintentional shifting of the apparatus, which affords us another example of the truth of the consolatory old proverb:—*A quelque chose malheur est bon.* With the exception of MM. Vernier, Son (of Belfort), and Goulier, I do not know that our French photographers have much occupied themselves with the interesting phenomenon. I have not seen M. Goulier's pictures, but M. Vernier has sent me three, which, although of small size, give a very exact

image of the sun at three different periods of the eclipse. They are all surrounded by a halo, the cause of which M. Verrier seeks in the phenomenon itself, and which, according to the adepts in photography, is to be explained by the simple fact that the operator made use of an objective with too large an opening. This shows how delicate such experiments are, and what care is necessary if we wish to arrive at exact conclusions.

Mons. M. A. Gaudin has just published a dry collodion process, to which I would call the attention of your readers. The collodionised glass, after being well washed in water on leaving the silver bath, is left in a water bath, to which have been added a few thousandth parts of alkaline, chloride, or iodide. In this manner the nitrate of silver is entirely destroyed, and forms a corresponding portion of chloride or iodide of silver, which combines with the original sensitive pellicle. Having again been washed with common water, and then with distilled water, the plates are put to dry slowly in a suitable place, away from the light and the dust.

If the presence of the silver bath is useless during the exposure, its presence, according to M. Gaudin, is indispensable for the development of the image; for, before we pour the developing solution upon the glass, this latter must be first dipped into water and then into the silver bath, as if it had not already been sensitised.

Starting from this same principle, our friend proposes, as a means of preserving positive papers, to dip the sensitised sheets into salted water, on taking them from the silver bath. One or two per cent. will be a sufficient proportion. After some hours' stay in this water, the sheets are rinsed in common water, and then put to dry. You see that the process proposed by M. Gaudin is as simple as it is feasible. ERNEST LACAN.

New Books.

Shepherd & Co.'s "Universal" Guide to Photography, by a Practical Photographer. Third Edition.—London: E. Marlborough & Co., 4, Ave Maria Lane; Shepherd & Co., 97, Farringdon Street, E. C.

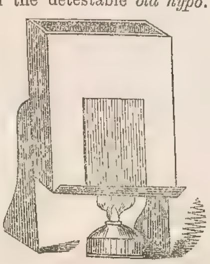
This is one of the pamphlets, of which the name is "legion," intended to indoctrinate the unlearned into the mysteries of the black art, and, at the same time, impress them with a decided conviction that the best possible place for them to procure apparatus and chemicals is at the establishment of the publishers. This is all reasonable enough; it is not to be expected that any one carries on business out of pure philanthropy: moreover, as a rule, there is really very much information to be gained from the generality of pamphlets like that now before us, and to which it forms no exception in this particular. But there is somewhat in it to which we object, and for which little excuse can be offered, seeing that it is a *third* edition. We notice no less than three palpable typical errors in one page, and that one only the seventh in the book, the word "*foci*" being twice used for "*focus*," and "*course*" for "*cause*."

Our attention was, however, specially drawn to those blunders by the following very extraordinary assertions in that page and the next, which we quote, viz.:—"It is common to hear of a lens being slow or quick in its action; this is *purely accidental*," &c. Again:—"So that a lens of twelve inches focus, covering eight inches square, is not half so quick in action as a lens of six inches focus, covering four inches square, for the amount of light *reflected* from the same object *is four times as much in one case as in the other*." (!) The italics in both passages are our own.

We strongly recommend the publisher to expunge the passages above quoted, for as manufactures of lenses they may find them injurious; because, if people judge of their practical knowledge of lens constructing by their theoretical knowledge of optics, they will probably be held in less estimation than they deserve.

Not a word is said about the respective diameters of the lenses, though, no doubt, the writer intended his observations to apply to those of equal diameter; and the assertion relative to the amount of light *reflected* from the object is simply—nonsense.

In the formulæ we notice a tendency to very unnecessary complication, and, as a rule, the amount of nitric acid directed is exorbitant. We are glad to perceive, however, that in the printing and toning formulæ Maxwell Lyte's method finds a place, though the detestable *old hypo.* bath is also included, and even takes precedence thereof.



When treating of the Taupenot process, there is a capital suggestion for drying the plates, after being albumenised. It consists of a tin vessel, made in the form of an ordinary dipping bath, but a little raised from the table, and furnished externally with a ledge, upon which the plates can be rested on end. The bath is filled, when in use, with boiling water; and the water is kept boiling by a spirit lamp or gas flame underneath. The annexed cut shows this application, and we presume they are to be procured of Messrs. Shepherd and Co.

Correspondence.

THE EXHIBITION OF PHOTOGRAPHS AT SALFORD.

To the Editor.

Sir,—I trust you will do me the justice to publish fully, in your Journal of August 1st, the enclosed letters, in direct contradiction of the scurrilous attack and calumniating charge made upon me through the medium of your Journal of 16th July.—I am, yours, &c.,

Manchester, July 17, 1860. JNO. L. DAVIES.

TO THE SECRETARY OF THE PHOTOGRAPHIC SOCIETY.

Sir,—In refutation of the very extraordinary charge of unwarrantable allegation imputed to me in the "resolution" your Society thought proper to adopt, in my absence, at the last meeting, I beg to state that all arrangements and subsequent alterations, both in the "hanging" and reception of the several works of art at the Exhibition of the Salford Royal Museum and Library (including the photographs), were conducted, as I am instructed, by the gentlemen forming the committee elected for such purpose, of whom the Mayor of Salford was one; and from such committee the curator, Mr. Plant, would doubtlessly receive *final* instructions, which were decided upon after the "private view." I may add that the pictures which have formed the subject of the groundless report you allude to were solicited by the chairman and others of the Museum and Library Committee some considerable time before the opinion and co-operation of your Society was sought, and frames for their reception were furnished to me by those gentlemen, and, I presume, they did not deem it incumbent upon them to ask the "sanction" of a contributing Society as to where such pictures might be hung. In conclusion, I feel justified in requesting that you will place my reply to this calumnious imputation before your committee, and that you will render it the same amount of publicity as the charge has received.—I am, yours truly, JNO. L. DAVIES.

4, *St. Ann's Square, July* 17, 1860.

P.S.—I enclose copy of a letter from the Mayor of Salford corroborating the aforesaid statement.

[COPY.]

Dear Sir,—We beg to state that the arrangement committee of the Royal Museum, Peel Park, applied to you for the loan of some of your excellent photographs some time before the Photographic Society promised to be contributors to the Exhibition, and felt greatly obliged by your then promising to contribute.

With regard to the "hanging" of the photographs originally, or any alterations made subsequent to the private view, we entirely acquit you of all blame, and regret that the Photographic Society should have brought the charge they have done against you.

Had the secretary inquired from the arrangement committee *before* the resolutions were published, we think he would not have blamed you in the matter.

We remain, dear Sir, yours respectfully,

(Signed) J. W. WESTON, Mayor,

July 17, 1860. And Member of the Arrangement Committee.

A PHOTOGRAPHIC MIRACLE!

To the Editor.

Sir,—Having been for some time past a looker-on at photographic operations, I have just commenced the practice of the art, and have gone to some considerable expense in procuring a proper outfit of apparatus and chemicals. I was just beginning to enjoy my work, having mastered most of my preliminary difficulties, when yesterday a photographic friend called on me, and showed me an announcement in a number of a photographic contemporary, to the effect that a French gentleman, whose name I forget, had invented a new *photographic ink* to supersede the use of nitrate of silver, and that another of his countrymen had, in consequence of seeing Woodward's enlarging camera, invented an apparatus by which an amateur, who is almost ignorant of the art, may be converted into a skilled photographer with the aid of an hour's instruction from an adept in its use.

I fear that I have been rather too fast in procuring my outfit, and was not a little mortified to find how much better I might have fared by waiting a little.

On thinking matters over, however, it has occurred to me that possibly the author of the notice in question may have been a little too fast; so I have determined to write to you for an opinion, feeling sure that you will at least give me a candid one.—I am, yours, &c.,

P. WARBECK.

Kensington Gore.

[You have no reason to be dissatisfied; the conductor of our *weakly* contemporary must have been very hard up for a wonder to make such a blaze about a trifle. As usual, anything that comes from the other side of the channel is with him a marvel; while the same thing, or a better one, under his very nose, if brought out by an Englishman, is either ignored or reckoned of no value.

We had a good laugh over the paragraph to which you allude before receiving your note. With regard to the first item, the *authority* quoted is, we believe, a *very pleasant old lady of the male sex*, who so frequently commits errors in judgment that we attach no importance whatever to his opinion on the matter either one way or other. The new *ink* may or may not be of great value: we hope it is. It is very probable that it may be, as its introducer is a skilful photographer.

The second part of the announcement is, however, pre-eminently absurd: there is no novelty whatever in the idea of enlargement; and as regards the camera mentioned, reference to our columns will show that M. Bertsch holds it in quite as much disesteem as we do. M. Bertsch, of whom we know nothing save by his writings, is evidently a man of scientific attainments; and though we are not disposed to take any alleged fact in science for granted without examination, we should hesitate long before concluding him to be in error in his own speciality. The automatic camera proposed by him is, however, not quite so new as he supposes: it is only a development of what has already been done by

Mr. Skaife, in what he calls his *pistolgraph* (anathematised be the name!), of which you may readily satisfy yourself by a visit to his establishment in Baker Street.

M. Bertsch's arrangement will, however, be a further development of the idea, and a good one, too, judging from his published intentions, and his enlarging arrangements are worth fifty of Woodward's.—Ed.]

WAVY LINES IN FOTHERGILL PLATES.

To the Editor.

Sir,—Would you kindly look at the enclosed stereograph and inform me what the cause of the marks you see across it in every direction can be. It is from a "Fothergill" plate of my own preparation. I am an amateur, and have followed this process for three years, during which time I have taken a great many pictures, most of them good enough to satisfy an amateur; but this year I have met *with nothing but failures.* I have tried new baths, five or six different solutions; prepared about fifty plates, with slight variations in each, such as *albumen* of *different* strengths, *much and little washing, &c.*—in fact *everything I can think of;* but the plates come out covered with *thin wavy lines* in all directions. I cannot account for them myself. I have inquired of many professional operators and they assign different reasons, and I have acted on their suggestions, but with no better result. I am now about to give up the process in disgust; but before doing so, I have been advised to write to you. If you will be kind enough to give me an answer as to the cause of these marks on the picture, in the next number of your Journal, which I take, I shall feel greatly obliged. I enclose my card.

I am, yours, &c., J. W.

P.S.—I generally use Keene's or Horne and Thornthwaite's collodion; am most particular about cleanliness of plates and preparation, having practised photography the last seven years.

[We have no doubt about the cause of your wavy lines: they arise from an error in manipulation, although you do not describe your *modus operandi.* In adding albumen to your diluted nitrate of silver solution on the plate, sooner or later a curdy precipitate is formed, and parts of this adhere very tenaciously to the film, but can generally be removed by letting fall a good stream of water on to the plate, and inclining it alternately in various directions. No amount of mere immersion is of any use; you must let the water fall on the plate, and that from some height.

We recommend you to proceed as follows:—After sensitising and diluting the free nitrate, *in your own way*, pour on about half an ounce of *dilute albumen* for a stereographic-sized plate, pouring it along the edge, and allowing it to flow evenly across to the opposite side, and let about half of it run off at the side, allowing the remainder to flow back and remain on the plate for about one minute; then wash off by a stream of water, holding it under the tap. You cannot wash too freely.

Make your dilute albumen by adding one ounce of white of egg to three ounces of water, and dissolve therein six grains of citrate or phosphate of soda.

Follow this plan, and we are convinced you will no longer be troubled with the wavy lines, provided that you do not allow any accumulation of water at the lower angle when drying.

After washing under the tap, it is better just to flow over the plate, for a final wash, about half an ounce of *distilled* water.

Let us hear of your success.—Ed.]

THE PICTURESQUE FOR PHOTOGRAPHERS.

To the Editor.

Sir,—It would much oblige myself personally, and doubtless many other amateurs, if you would publish a list of the most picturesque places, suitable for the photographer, around London—say within thirty or forty miles, or an easy railway distance.

Such a list would be a great boon, and it should point out the trains or conveyances to go by, and how to proceed afterwards; that is, the shortest routes to the "nice spots," &c., &c.

I am, yours, &c., DRY PROCESS.

P.S.—Perhaps you can help us in the forthcoming number, as we have not now many spare Saturdays to depend upon. Your excellent correspondents, Messrs. Hannaford and Wall, will probably assist you with their knowledge and experience.—D. P.

[It is singular that before receiving your note we have replied to another correspondent to a somewhat similar question—(see "Answers to Correspondents"); and for the purpose desired by him we recommended a visit to Sevenoaks, in Kent. Access by *Mid Kent* Railway, from London Bridge to Bromley Station; thence by omnibus, which meets two of the trains daily.

Reigate is another fertile spot for the photographer, where abundance of admirable subjects can be found. You might work in this neighbourhood for months. Colchester, again, presents many nice landscape and rural subjects. We shall be happy to publish any similar hints from our correspondents.—Ed.]

FOTHERGILL PROCESS.

To the Editor.

Sir,—In the preparation of dry plates by the Fothergill process, what precaution is necessary to prevent water markings? Would a longer time in the diluting water and more movement be of benefit?—that is, after sensitising, putting it into the diluting water, and continue moving it up and down for some five minutes instead of three minutes, and afterwards coating with dilute albumen, containing a solution of chloride of ammonium.—I am, yours, &c., W. G. T.

[It is not a question of *time* but of movement of the washing water. We generally use about *an ounce* of distilled water to a plate ten by eight inches, which we pour on and keep in motion until it will pour on and off without any appearance of streakiness, which will happen in from two to three minutes. We then apply dilute albumen—one part to three of water—containing about two grains of citrate or phosphate of soda to each ounce of mixture: leave this on for three or four minutes, and then wash very copiously. We never experience water marks.—Ed.]

SUGGESTION FOR A NEW PHOTOGRAPHIC INK.

To the Editor.

Sir,—There is a circumstance that has attracted my attention relative to photography that may be found useful; but not having time or a sufficient knowledge of chemistry to prosecute it, I have ventured to solicit your insertion of the few remarks I have to make in your Journal, in the hope that they may meet the eye of some person who has the time and knowledge required.

What I have observed is this:—That the juice of new potatoes produces a precisely similar stain on the skin as that of nitrate of silver. Whether the light operates on it or not I cannot say, but it is removed by similar acids. Trusting that it may be found useful in photography,

I am, yours, &c., JOSEPH STUBBS.

Liverpool, August 2, 1860.

[We do not expect to find that light plays any part in the phenomenon; but it is easily tried.—Ed.]

ANSWERS TO CORRESPONDENTS.

Erratum.—In page 241, outside column, 31st line from foot, for "slides" *read* "sides."

J. L.—Declined with thanks.

Sold.—Not so; you will find it correct.

Well-wisher and Fk. Anslow.—Thanks for your good opinion.

Misty.—This correspondent's letter shall appear in our next number.

A Clerical Amateur.—Too late for insertion in this number; shall appear in our next.

A. M.—Your specimens are not of sufficient merit to permit us to notice them: they are all more or less faulty.

L. Stansbury.—It is highly probable that you may obtain the subjects for which you ask by application to the officers of the Department of Science and Art, at the South Kensington Museum.

F. Baker.—The person named deals in second-hand photographic apparatus, and we believe him to be honest and worthy of dependence. We think you will be quite safe in his hands.

Subscriber.—See replies to "W. G. T." and "J. W." Protect your gas-burner by yellow calico and you may use plenty of light to work by. Your exposure may be from five to fifteen minutes, according to circumstances.

Solitary One.—Take to the camera, by all means. Join one of the metropolitan societies (that nearest to your residence in preference), and we can safely prophesy that ere long your present signature will be a misnomer.

Anti-Humbug.—Your signature is inappropriate: you do not object to be "humbugged," but to the operation being clumsily performed, that is, if we understand your letter aright. Your change appears to us to be "from the frying pan into the fire."

A Curate.—See reply to "A Clerical Amateur." Try a *thin* collodion, and wash with a weak solution of bromide of potassium, say one grain to the ounce, then with rain water, and dry without any preservative. Before developing, put the plate into a bath of nitrate of silver, ten grains to the ounce, and develop with proto-*nitrate* of iron.

A Young Photographer.—Questions 1, 2, and 3, have been so repeatedly answered by us that we must refer you to our back numbers, or to any good manual, of which there are plenty to be had for the cost of one shilling.

4. Your remedy for a "fog"-producing bath was diametrically opposed to what it should have been: a drop or two of dilute nitric acid will most likely restore it.

Muddle-headed.—We cannot see what there is to confuse you: coat your plate—sensitise it—expose in the camera—develop the image—wash and remove the sensitive coating, *i. e.*, fix—well wash and dry—six operations always performed in the same order. If you cannot remember these, how can you expect to take a picture? Study your Manual well before you begin to work, and if you will begin by printing, instead of trying to take negatives, you will get on all the faster.

S. W. L.—1. Your albumen can be used without filtering, if you allow it to stand and pour off gently only about half of the upper portion for use. Your filtering paper has been too dense; procure either some Swedish filtering paper or some of the circular, grey, French filters. See replies to "Subscriber," "W. G. T.," and "J. W."—2. Your collodion wants thinning with ether.—3. Your questions on colouring shall be forwarded to Mr. Wall.

Thomas Marlet.—You will find some excellent studies of trees in Knole Park, at Sevenoaks, in Kent, where you may very profitably spend three or four days with your camera. You will find the "Crown" a very comfortable hostlery, with a nice old fashioned garden, in which to take your ease after the fatigue of the day. There is also a very attractive panoramic view to be obtained near to one of the entrances to the Park, on the road to Tunbridge, and there are also many nice rustic "bits" to be had in all directions. We recently spent a couple of days there (Saturday and Sunday), and were much taken with its photographable (!) capabilities.

A Highland Laddie.—Your lens seems to be a very fair one for portraits, but you could get better results by a proper landscape lens for landscape purposes. A whole-plate lens for portraits would produce *larger*, but not necessarily better pictures—probably not so good. Of those you have named we prefer No. 3, but we could indicate better still. We do *not* recommend you to procure an orthoscopic lens for what you require.—Carbonate of soda will do. The woolly substance is a fungoid growth. Citric acid should be kept dissolved; but you may filter out the fungus, and the solution left can be used. Send a directed envelope, and we will let you know what to do about your landscape work.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 125, Vol. VII.—SEPTEMBER 1, 1860.

Most of our readers are sufficiently well aware that we have not unfrequently had the misfortune to differ in opinion with Mr. Sutton, of Jersey, upon various matters of interest to photographers; and as we have not shrunk from expressing our dissent when called upon to do so, neither do we avoid mentioning our hearty concurrence with respect to a matter towards which he has been recently directing the attention of his friends—and we do so with more alacrity owing to the rarity of the occurrence of our agreement.

The subject to which we make allusion is primarily that of taking *negatives* upon albumenised paper, and incidentally relative to albumenised paper for positives. As regards negatives upon albumenised paper, the first suggestion for its application emanated from Mr. Mayall about four years ago, and we have some recollection of that gentleman having promised to read a paper upon the subject before the Photographic Society; but, like many other "good intentions," we presume it only formed one of the paving stones said to exist in a locality that shall be nameless. Whether any experiments were carried out by him in this direction or not we are unaware; but the practicability of the plan was clearly demonstrated about twelve months ago by Dr. Maddox, an account of whose operations appeared in this Journal at the time specified. There were, however, certain manipulatory difficulties which still remained to be conquered, more particularly that of floating the prepared paper upon the sensitising solution, in consequence of the stiff and unyielding nature of it after the treatment that it underwent.

The object proposed for attainment by the employment of albumenised paper for negatives, is greater delicacy of definition than can be accomplished upon plain paper, just as we find positive proofs upon the former to possess more definition and transparency in the shadows than those upon the latter; and this effect is probably owing to the impression being kept rigidly to the surface instead of being allowed to sink partially into the fabric of the paper. This principle is one that we advocated for positive prints several years back, in a paper read before the Photographic Society, and which was totally opposed to the views then entertained by Mr. Sutton, but which views more extended experience has doubtless caused him to abandon. The principal object, however, at present in his speculations is the employment of paper for negatives, so as to obtain a maximum of sharpness of detail in order that he may apply it to work with his panoramic lens instead of glass; and a very legitimate object it appears to be, because by its substitution he not only gets rid of the great expense and difficulties of manipulation attendant upon the use of curved glasses, but it also enables an operator to focus to some extent the different parts of a subject as may be requisite, in the same manner as was done by M. Martens with his panoramic camera and revolving lens. Although we believe that the inventor of the panoramic lens maintains that there are no manipulatory difficulties in the use of curved glasses, and no need of focussing, we cannot concur in any such opinion; and we think he has done wisely in pointing out a way by which those who hold with us in this matter may avoid what they regard as grave inconveniences.

Of course it must be evident to every photographer that the substitution of paper for glass in the negative would be a very great boon to all, provided that nothing of importance were sacrificed in order to render the former available. We have strong hopes that for a very extensive range of subjects this may ere long be possible; and our advocacy of the attempt to bring about the accomplishment of this desideratum is without reference to the employment of any particular kind of lens.

There is another point upon which our opinion with reference to this subject coincides very fairly with that of Mr. Sutton, we mean with regard to the kind of paper most applicable for the purpose. We have made very many experiments with almost every kind of paper at all likely to be serviceable upon which we could lay our hands, and certainly that which we preferred upon all accounts was of Hollingworth's manufacture. We have not found any material difference between the thick and the thin varieties, but for negatives it is probable that the latter would be preferable.

We now come to the consideration of the best means of keeping the coating of albumen strictly to the surface of the paper, and rendering the paper itself as far as possible impermeable to aqueous solutions. In Dr. Maddox's experiments this object was sought to be accomplished to some extent by impregnating the paper with wax, or by the substance known as vegetable wax (an importation from Japan), in either case the wax being dissolved in paraffin oil, or in the analagous solvent known as Belmontine. Besides rendering the paper more or less impervious, it also subserved the purpose of increasing its transparency; but inasmuch as it has a tendency to unite more or less with the chemicals employed, and as paper impregnated therewith ceases to be useful as a basis for a positive proof, it would be advisable to adopt, if possible, some other *water-proofing* material, if we may so define it; and that which occurs to us as being worthy a trial is *plain collodion*, applied to both sides of the paper before the coating of albumen is laid on. Every photographer knows how difficult, not to say impossible, a matter it is to make an aqueous solution penetrate a film of dry collodion, provided that no "preservative" material has been superadded prior to desiccation: it is therefore by no means improbable that by properly applying this material the paper may be made sufficiently impervious, not only to prevent the sinking in of the albumen, but also to prevent the penetration of the various chemicals, and thus avoid their being stored up, as it were, in the fabric of the paper as in a sponge, to act and react upon one another, and thus ultimately, if not immediately, compass the destruction of the positive or negative impression, as the case may be. We also presume that under such circumstances the necessary amount of washing subsequent to fixation might very materially be curtailed with safety.

It may be objected that the suggestion which we have thrown out is a very crude one, and that we ought not to have made it

without having first of all tested its practicability. We admit that this would have been the better course, but, unfortunately, it is at present impracticable for us to do so, our time being so fully occupied in other directions; and we are not willing to lay aside for an indefinite time an idea which we think offers a fair prospect of solving a problem of particular interest at the present time, and which some of our more fortunate photographic brethren may have opportunities of putting practically to the proof—our object being neither honour or profit, but simply a desire to lend a helping hand in working out what we consider may prove to be an advantageous reform.

Since writing the preceding we find that this subject has been still further considered by the same gentleman who brought it forward, and that one of the drawbacks supposed to exist with reference to the use of albumenised paper for negatives is the imagined comparative rapidity of its deterioration after being sensitised, as compared with that of plain or waxed paper. But here again we believe we can suggest a remedy without reduction of sensitiveness; for if after removal from the nitrate bath the papers, instead of being washed in plain water only, are first treated with a weak solution of citrate or phosphate of soda, the conditions will probably be identical with those in which we find dry collodionised plates prepared by the Fothergill process, and on which we have taken satisfactory impressions after their having been sensitised for upwards of ten months. We see no reason why paper treated in this way should not, if properly secured against atmospheric action and that of light, keep in working order for one or two months at least.

The substitution of paper for glass as the support for large negatives would be a boon of such enormous magnitude to photographers, that we consider any attempt to accomplish it satisfactorily to be deserving of encouragement, and the complete solution of the problem worth almost any amount of trouble.

We described in our last, in reply to several correspondents, the particular method in which we have been in the habit of working the Fothergill process; and it is not a little singular that the estimation in which we hold that very convenient method of preparing dry plates should have been justified by the labours of Messrs. Petschler and Mann, the details of which we published at the same time. Any one who will take the trouble of comparing the two modes of operation—viz., that described by the Manchester experts and our directions for the Fothergill plates—cannot fail to be satisfied that the *principle* involved is almost identical in both; for, on reperusal of the paper, we have come to the conclusion that the cause assigned by Messrs. Petschler and Mann for the insensitiveness to light before the final washing of the plates, prepared by their very excellent method, is the correct one, though the reason for its being so is not pointed out. To prevent the possibility of any misapprehension we may remark that, in making the assertion above, we have not the slightest idea of laying any claim to our having possessed a knowledge of the interesting fact discovered by Mr. Petschler, and which, the more we consider it, the more highly are we disposed to estimate it; but the course of operations pursued, when analysed, really amounts to the difference of washing the albumen before drying it, in the one case, and after drying it in the other. The chloride of sodium or ammonium may be substituted for the citrate or phosphate of soda with perfect indifference, as any one who has operated with the Fothergill process upon scientific principles knows as a matter of course; but we have preferred the salts mentioned on account of their producing greater intensity in the negative. In the plates, as prepared by Messrs. Petschler and Mann, we apprehend that the chloride might be replaced by the other salts, though possibly not so advantageously.

The facility of keeping plates in an insensitive condition, that can be rendered active by simple washing, is, to say the least, a very great convenience. On considering the *rationale* of the experiment it appears to us to stand thus:—All free nitrate of silver is converted into a chloride by *excess* of chloride of sodium or its analogue, and it is impossible to reduce the chloride of silver in presence of the free alkaline chloride, because as reduced it would be immediately reconverted into chloride of silver by decomposition of the surplus haloid salt; but by washing the plate the free chloride of sodium, which is soluble in water, being removed, the actinic action, if sufficiently prolonged, will reduce the chloride of silver just as in the ordinary printing process. The chloride of silver, however, being supported by a layer of iodide of silver, is much more readily acted on than when alone, as the iodide evidently possesses catalytic action, and conveys to the chloride the impulse received by it from the light. It is by no means improbable that an adaptation of this principle to the preparation of albumenised paper may solve the problem of satisfactory paper negatives.

That chloride of silver, even unaccompanied by free nitrate of the same base, would darken under actinic influence by partial reduction of the metal is a matter known to most photographers; but it is generally supposed that iodide of silver, under similar conditions, is quite insensitive to light. This is, however, an opinion that we have frequently combated as by no means *proved;* and we have, moreover, in the Daguerreotype plate an instance in which the direct contrary is established.

It is asserted that calotype paper that has been prepared with an excess of an alkaline iodide, which has been removed by copious washing, is not only insensitive to light, but actually improved by exposure to sunshine. But here again we take exception to the first postulate, and do not admit that the second is in any respect dependent thereon. Granted that the paper may be improved by exposure to light, does not that prove it *is sensitive* to its action? But we believe even more than this, viz., that the actinic impression is *removed* by the subsequent moistening of the paper in sensitising it. The point to which we were about to direct attention, however, is the very interesting one mentioned, that plates prepared with albumen and a chloride are more easily developed when *not* dipped into a second silver bath before exposure, while those prepared with albumen holding an iodide in solution act in a manner directly the reverse. This is another argument in favour of simplicity.

We feel very sure that our numerous readers will accord to the gentlemen who have brought forward the extremely valuable observations and experiments we have had the pleasure of laying before them their warmest thanks.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 11.

At the present time, when so much difference of opinion prevails as to the true theory of the dry collodion processes, any reasonable explanation which may be offered will be received with attention. Some time since, Mr. Burnett, of Edinburgh, gave expression to certain new views; and, almost simultaneously, Mr. Michael Hannaford propounded the same. These were, if we mistake not, in substance as follows:—In the wet collodion process free nitrate of silver imparts an increased sensitiveness to a film of iodide of silver. In a dry process this free nitrate must be removed, and its place supplied by a salt of silver either sparingly soluble or insoluble in water, such for instance as acetate, tartrate, citrate, oxalate, or chloride of silver. The theory, thus briefly expressed, is simple, and it had occurred to us as a probable one some time previous to the publication of the papers of Mr. Burnett and of Mr. Hannaford. The results of our experiments, however, were unfavourable, and did not uphold the theory to the extent anticipated. It certainly appeared that other salts of silver replacing the free nitrate were not without effect in a dry process; but at the same time we could not venture to deduce therefrom any conclusions admitting of general application.

Our first experiment consisted in an attempt to dissolve *a citrate* in collodion already containing a mixed iodide and bromide. There is a little difficulty in effecting this, since the citrates as a class are very sparingly soluble in alcohol and ether. We succeeded, however, to a sufficient extent, by neutralising citric acid with ammonia;

and having thus prepared a suitable collodion, we were in hopes that it would yield a dry sensitive film by simply washing with water after removal from the bath. This expectation, however, was not fulfilled; for the negative so obtained was feeble, and clouded over on the transparent parts. Conjecturing this to have been due to a too complete shrinking on drying, we next washed a film from the same collodion, with distilled water, and flooded it with solution of oxymel; but the negatives remained very weak and blue. If the citrate exerted any effect, it was clearly one which was not sufficiently marked to be distinguished with certainty.

Having abandoned the idea of adding the organic salt to the collodion, we next tried the effect of washing the surface of an excited bromo-iodised film with a solution of the organic salt, a portion of free nitrate of silver having been left upon the iodide, with which the organic salt might combine. The first salt chosen was the bimalate of ammonia, which we happened to have by us in a crystallised state, and which we were inclined to select from an idea that an acid malate might possibly be the active constituent in the syrup of wild raspberries, recently proposed as a preservative. Malate of silver appears, as regards its solubility in water, to occupy an intermediate position between the acetate of silver and the tartrate of silver: it dissolves in boiling water, but separates in little crystals on cooling. The first success with the acid malate was cheering, for the plates developed extremely quickly, and exhibited a fine red colour by transmitted light. It should be mentioned, however, that in no instance was the organic salt employed alone: cane sugar was always added in the proportion of twenty grains to the ounce, to keep the film open and prevent it from becoming hard and skinny on drying. A repetition of the experiments with the malate was less encouraging. It appeared that a part of the previous success had been due to the condition of the collodion: this had been bromo-iodised for more than six months, and had arrived precisely at the proper state, being sufficiently pappy, and yet not rotten; whilst the tendency to active development was so strong on the dried plate, that a simple solution of cane sugar flooded over the washed film gave all that was needed. Nevertheless, the acid malate had not been without effect even in this experiment, for plates prepared with sugar only were not solarised as much as those containing the organic salt in addition to the sugar. It remained, therefore, to repeat the experiments with the same bromo-iodised collodion newly mixed, and on doing so the true action of the malate became apparent: it gave vigour and redness when combined with nitrate of silver, but the plates were extremely uncertain, fogging when the proportion of nitrate was too much increased, and soon losing their characteristic properties. With the old collodion the tendency to fogging had not been seen, but this was evidently because old collodion preserves the clearness of the transparent parts better than new. The fogging also was not that description of clouding which takes place when the power of development is too much lowered, and which a little gallic acid left upon the film would remedy, but rather an incipient reduction of silver, such as one sometimes sees in the honey process, and which indicates that the chemical actions are running riot, and that a free acid must be used to control them.

Dismissing the malate, we proceeded with the tartrate, citrate, and oxalate; and, having satisfied ourselves that a little free acid was useful in preventing fogging,* we invariably worked with a bi-salt, and neutralised only a portion of the base. Citrate and oxalate are often classed together, but photographically they are very different. If both be employed in conjunction with chloride of silver, in a printing process, it will be found that the citrate alters the tone of the print to a red, whilst the oxalate has comparatively little effect upon the colour. Again, if citrate be added to an ordinary negative bath, it immediately robs it of its iodide, and carries the iodide down in insoluble combination; but it is very difficult to effect the same removal of iodide with an oxalate, and enough oxalate may be added to throw down more than half the silver in the bath, without precipitating the whole of the iodide. At first, indeed, we thought that there existed no affinity whatever between oxalate of silver and iodide of silver; but, on examining more carefully, it was found that a part of the iodide was carried down, although a part still remained in solution. We mention these facts to show that tartrate, citrate, and oxalate cannot be classed together as photographic agents, although the two former produce effects which are closely analagous. Whether it be that the tartrate and citrate act strongly in photography, because they have a certain affinity for oxygen, and that the oxalate acts less decidedly because it is an ultimate product of oxidation, we do not now stop to inquire: it will be sufficient to indicate the facts for the guidance of those who may follow us in this investigation.

The colour of the negatives was not precisely the same with the citrate as with the malate, and in the case of the oxalate it was different from either. The oxalate indeed proved useless, from its throwing down a visible deposit of oxalate of silver upon the film, and producing numerous transparent pin-holes; the tartrate did the same, but in a less degree.

Here we paused to consider how far it would be worth while to continue the experiments, since it appeared doubtful whether we were upon the right track. The organic salts of silver had evidently modified the colour and density of the negatives; but equally good pictures, perhaps better, were obtained by washing the collodion rather abundantly with water, and coating it with a simple organic substance, like gum arabic. In this case no salt of silver was present, except iodide and bromide;* whilst even the bromide could be dispensed with, and a picture obtained. The gum, however, or some analogous substance, appeared very useful, so that this seemed the proper direction for further experimenting.

Albumen has a remarkable action in dry processes, as all are aware, and albumen precipitates an insoluble compound with nitrate of silver. It does not, however, appear that other bodies, which also precipitate nitrate of silver, can be substituted for the albumen, and that citrate, oxalate, or chloride will succeed equally well. Albumen, therefore, must possess some additional property which renders it useful in dry processes, and whatever this property be, it seems to be possessed also by gelatine, gum, and to some extent also by cellulose.

As regards the composition of the sensitive iodide which receives the latent picture in the dry processes, we lay stress upon the fact that some varieties of pyroxyline can be shown to possess the property of withdrawing small quantities of nitrate of silver from the bath, and forming therewith a combination which resists for a time the decomposing action of a soluble chloride; therefore the film from a bromo-iodised collodion, which has been kept for six months in the iodised state is not to be viewed as simple iodide or bromide of silver, but rather as containing traces of organic compounds of silver associated with the bromide. If the pores of such a collodion are afterwards filled up with gum or gelatine, the conditions of permeability insisted on by Dr. Norris are fulfilled, and the development is thereby facilitated.

* It has already been mentioned that the plates in these experiments were prepared as if for the Fothergill process, each stereoscopic film being washed with half-an-ounce of water, before putting on the organic salt; free nitrate of silver was thus left upon the film.

* In making this observation we refer to salts of silver purposely added: on previous occasions we have expressed our belief that a minute portion of nitrate of silver is retained in organic combination with the pyroxyline, and that neither water alone or water containing salt will immediately decompose this compound.

THE PRACTICAL DETAILS OF PHOTO-ZINCOGRAPHY,

AS APPLIED AT THE ORDNANCE SURVEY OFFICE, SOUTHAMPTON,

For the Production and Multiplication of Facsimiles of Ancient Manuscripts Maps, and Line Engravings.

By Colonel Sir HENRY JAMES, R.E.,

Director of the Ordnance Survey.

THE art of copying ancient manuscripts or any outline engravings by means of photo-zincography is likely to prove of such great importance for the production of authentic copies of rare and valuable documents now locked up and inaccessible to the public, that I have thought it advisable, with the assistance of Captain A. de C. Scott, R.E. (who has charge under me of that branch of the work of the ordnance survey which includes the reduction of the plans by photography), to give to the public the result of our experience up to the present time. I am led to adopt this course in the desire to see this art brought to the highest degree of perfection of which it is susceptible, in the shortest possible time, and under the conviction that when some of the many highly talented and ingenious photographers we have in this country take up this branch of their art, they will be able to suggest and introduce improvements which may not occur to us.

The singular advantage which this art possesses consists in the fact, that we can now produce authentic copies of any of the numerous rare manuscripts which are carefully preserved in different parts of the world, and print any number of copies of them that may be required at a cost which will not exceed one penny for a folio-sized sheet,† and this without ever touching the original docu-

† In the report of the committee, of which Sir R. Murchison was chairman, it is stated that the annual saving effected by my having introduced photography as a means of reducing the Ordnance plans from the larger to the smaller scales, amounted, in the year 1858, to £1,615. Since then we have so much reduced the cost of the photograph, that the saving which will be effected will amount to £35,000 on the cost of the survey.

ment, or, if required, without even being in the same room with it, provided we only have a hole in the wall to place the lens of the camera in.

By the term "Photo-Zincography" is meant, as the name implies, the art of producing a photographic *facsimile* of any subject, such as a manuscript, a map, or line engraving, and transferring the photograph to zinc, thereby obtaining the power of multiplying copies in the same manner as is done from a drawing on a lithographic stone, or on a zinc plate.

The first part of the process concerns the production of a negative photograph on glass of the document, of exactly the same size as the original. This is obtained by the ordinary wet collodion process, and too great care cannot be taken to obtain one as perfect as possible, as every defect will be transmitted through each step of the process till it affects the final result. As affecting success at this stage, the lens used should be as perfect as possible, and fully capable of projecting an image of the size required without sensible distortion. Lenses are used at the Ordnance Survey Office of various diameters, depending on the size of the document to be copied — the largest being eight inches in diameter, forty-one inches in principal focal length, and capable of producing negatives free from sensible distortion sixteen inches square, a stop one inch in diameter being placed eight inches in front of it.

The distance from the lens to the ground-glass of the camera when adjusted so as to copy a subject to the same size, is seven feet three inches, and from the lens to the subject of course the same.

The readiest means of adjusting the camera and lens in their proper position relatively to the object and to each other when it is required to produce a negative the same size, is to ascertain by actual measurement with a proper scale a lineal dimension of the subject (as its width or length), and so to regulate the distance of the lens from it that, when the image is focussed on the ground-glass, it shall equal, in its corresponding dimension, that already read on the scale. This can easily be done by a system of repeated trial and correction of error. When the lens and camera are in adjustment, the glass plate is covered with the sensitive coating—exposed, developed, and fixed in the ordinary way; when fixed, it is immersed in a saturated solution of chloride of mercury (corrosive sublimate). When well whitened by the action of the salt, it is removed, washed with water, and then with a solution of hydrosulphate of ammonia, consisting of ten parts of water to one of hydrosulphate of ammonia of commerce.

In this manner the ground of the negative is rendered extremely dense, without affecting the clearness of the detail. When dried and varnished it is ready for use.

We now come to the preparation of the sensitive paper. The quality of the paper used is a point of much importance. Various samples have been tried, but that which has been found best suited for the purpose is a semi-transparent kind, with a smooth surface, known by the name of engravers' tracing paper.

A solution of gum arabic is prepared by dissolving three parts by weight of gum arabic in four parts of distilled water.

Boiling water is then saturated with bichromate of potassa, and one part of the solution of gum arabic is mixed with two parts of the solution of bichromate of potassa, both being kept at a temperature of about 200°.

The paper is evenly coated with the hot mixture with a flat camel-hair brush, and dried; it is then exposed under the negative in the usual way. The time required for printing may be said to vary from ten minutes in diffused light to two minutes in the sunlight, though there are days on which an exposure of twenty minutes would not impress a sufficiently marked image; but at such times it is not advisable to print, if it can be avoided, as the results will hardly be good. The period of exposure is determined by the appearance of the print: when all the details appear distinct it should be removed.

The next step of the process is the coating of the whole surface of the print with an even and thin layer of a greasy ink, which is composed of the following ingredients:—

Middle linseed oil varnish	$4\frac{1}{2}$ oz.
Wax	4 ,,
Tallow	$\frac{1}{2}$,,
Venice turpentine	$\frac{1}{2}$,,
Gum mastic	$\frac{1}{4}$,,
Lamp black	$3\frac{1}{2}$,,

A portion of the above is dissolved in oil of turpentine, so as to make a solution of the consistency of thin cream, which is easily applied to the surface of the print with a brush.

It should here be observed that the extent to which the greasy ink is diluted is in great measure determined by the nature of the subject photographed: if it is of an open nature, such as a bold engraving or etching, the solution may be considerably thicker than when the subject is finer. Experience is the only guide in determining this point.

The turpentine is allowed to evaporate for half-an-hour, and the print is then floated back downwards on hot water for a few minutes, and then removed, and laid face upwards on a porcelain slab.

The surface is gently rubbed with a sponge dipped in warm gum-water, and the ink readily leaves the surface at those parts which have been unacted on by light, while it adheres tenaciously to the detail.

As soon as the lines are quite clear, the print is placed in a flat dish, and washed first with warm and finally with cold water. When dry it is ready for transferring to zinc or stone.

There are two methods of transferring to zinc, varying according to the quantity of ink in the photograph.

If a very small quantity has been applied, on account of the closeness of the subject, the print is transferred by the anastatic process.

For this purpose the surface of the zinc plate is polished with emery powder, and made as smooth as possible. The print is placed for about ten minutes between sheets of paper, which have been damped as uniformly as possible with a mixture of nitric acid and water, in the proportion of five parts of water to one of concentrated acid. A sheet of paper, damped with the acid, is laid on the zinc plate, and both are passed between the cylinders of a copperplate printing-press, and the acid being forced on to the zinc slightly etches the surface. The paper is then taken off, and the film of nitrate of zinc formed on the plate is carefully cleared off with a handful of blotting-paper. The print is next laid on it face downwards, and both are passed once through the press. The paper is then pulled off, and the transfer is gummed and brought up by going lightly over the surface with a sponge dipped in printing ink, softened with olive oil. As soon as all the detail appears strong, it is etched with a very weak solution of phosphoric acid in gum water, the strength of the acid solution being so regulated that a drop placed on a smooth zinc plate for three minutes slightly tints or dulls the polish. The transfer is then ready for printing in the usual way.

If a larger quantity of ink has been applied the mode of transferring is somewhat different.

The plate is prepared by rubbing the surface with fine sand and water, and a zinc muller, to give it a grained surface. The print is laid for ten minutes between sheets of paper, damped as uniformly as possible with water: it is then laid, face downwards, on the plate, covered with two or three sheets of paper, and passed once through an ordinary lithographic press. The sheets of paper being removed, it is damped at the back with gum water, till its adhesion to the plate is so lessened that it can easily be pulled off. After the transfer has been gummed, brought up, and etched, as in the anastatic process, the ink is cleared off with turpentine, and the design is rolled up with printing ink. Impressions can then be taken from it. The photographic print can be transferred to stone in the same manner as to grained zinc, the surface of the stone being prepared as for ordinary lithographic transfers.

Having described the methods of transfer, it is necessary to treat further of the considerations which determine the quantity of the ink used, and consequently the mode of transfer. The quantity of ink which it is necessary to apply to the photograph to make a successful transfer to grained zinc is greater than that which is necessary for stone, and the anastatic process requires the least of all.

The action of the warm water, in which the print is immersed, on the insoluble gum, is to cause it to swell, and the ink which overlies the lines formed of insoluble gum expands likewise. It is evident, therefore, that if the subject photographed is of a close nature, as a fine engraving, the amount of enlargement of the ink lines may be sufficient to bring them into contact while the print is in the water, and when once they have coalesced, they will not again separate when the gum resumes its natural size, on the drying of the print, and there will be a continuous shade of ink instead of lines. In such a case the quantity of ink applied should be as small as possible, and, to enable a light but even coating to be laid on, it must also be thin; and, as a consequence of the small quantity of ink used, the transfer must be effected on a smooth plate by the anastatic process, because to make a successful transfer to a grained plate, or to stone, a larger quantity of ink is necessary.

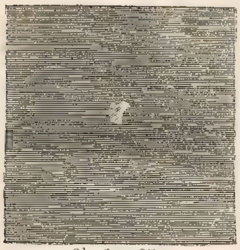
On the other hand, as impressions taken from a grained plate, or from stone, are, as a rule, better than those from a smooth plate, and as a larger number can moreover be struck off, if the subject photographed is so open that there does not appear to be any likelihood of the lines coalescing in the water, it is better to apply the ink in a greater quantity to the print, as a certain quantity is a *sine quâ non* for the employment of the latter mode of transfer.

[Those who may be interested in this important branch of photography, and are desirous of inspecting the results obtainable, will find a carefully-executed *facsimile* of an ancient manuscript in the Record Office, which has been copied and printed by photozincography at the Ordnance Survey Office, Southampton, in the last *Report of the Progress of the Ordnance Survey*, published by Messrs. Eyre and Spottiswoode, at Her Majesty's Stationery Office, London. Price 3s., by post 3s. 2d.—Ed.]

THE SOLAR ECLIPSE OF 18th JULY.

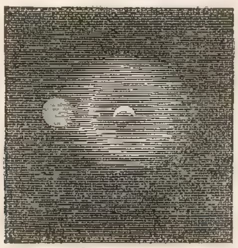
By Charles Heisch, F. C. S.,
Professor of Chemistry at the Middlesex Hospital.

I send herewith some photographs of the eclipse of July 18th, as seen at Greenwich, which may be interesting to your readers.



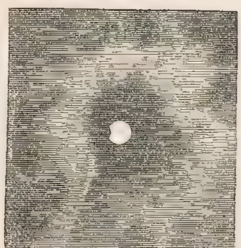
2h. 3m. 37s.

2h. 31m. 37s.



2h. 48m. 7s.

3h. 7m. 37s.



3h. 47m. 57s.

I should be very glad if any one can offer an explanation of the curious moonlike reflection visible in three of them, most vivid at the moment of greatest eclipse. I at first thought it might be due to some reflection in the camera, but became convinced that it was not so on observing the manner in which the image shifted its position with regard to the sun as the moon's shadow passed over it. I have since found that the appearance in question was *seen* by several independent observers, who describe it as "like a faint moon," somewhat to the left of the eclipsed sun as you look at it.

So many objections present themselves to every explanation which I have yet thought of that I prefer attempting none, hoping to get a better from some one else.

I should mention that the camera was mounted on the stand of an astronomical telescope; the image of the sun brought to the centre of the ground glass. The exposure was, I should think, about one-eighth of a second, but I cannot say very exactly.

Blackheath, August, 1860.

CELESTIAL AND INSTANTANEOUS PHOTOGRAPHY.

By Warren De la Rue, Esq., F.R.S., F.R.A.S., &c.

(Continued from page 239.)

Collodion.—The condition of the collodion is also an all-important point, and it appears to be very capricious in its properties. It is preferable not to make the collodion oneself, but to use that prepared by makers of repute; I usually employ Thomas's or Hardwich's collodion, both of which I have found to be very uniform in quality.

It is desirable to sensitise frequently new batches of collodion, and to determine by experiment from time to time the gradual development and decline of their sensitiveness.

Collodion should not be sensitised until after it has stood for, at least, a week after it has been purchased, and it must then be carefully poured into the mixing vessel without disturbing the sediment which always is present. It must be agitated occasionally for some hours after mixing with the sensitiser, before it is set aside to rest and deposit the new sediment which forms. After standing for a week, it should be carefully decanted for use, to the extent of three-fourths, into a perfectly clean glass vessel.

The glass mixing vessels should invariably, previous to use a second time, be washed out, first with a mixture of equal parts of ether and alcohol, and then with water and pieces of blotting-paper, well shaken up, so as to reduce the paper to pulp; and finally, rinsed out with distilled water, and suspended in a warm place, mouth downwards, to drain and dry thoroughly.

Iodide of cadmium appears, on the whole, to be the best sensitiser for collodion to be used in celestial photography: collodion prepared with this salt is not very active when first mixed; hence it differs from collodion prepared with iodide of potassium and iodide of ammonium in this respect, but it gradually acquires a degree of sensitiveness unsurpassed, if equalled, by collodion rendered active with the latter salts, used either alone or mixed with other salts. Collodion mixed with iodide of potassium acquires, it is true, great sensitiveness soon after it is prepared, but in a few days it loses in this respect, is moreover continually changing, and is seldom available in celestial photography after standing a month or six weeks; whereas cadmium collodion will retain its qualities for several months. As fresh mixed collodion is certain to produce both white and dark specks in the photograph, as large or larger than the details visible in the picture with a magnifier, it will be seen that a collodion which can be kept for a long time to deposit, without losing in sensitiveness, must be the most valuable; moreover, in collodion mixed with the alkaline iodides there is always an evolution of free iodine which soon impairs the sensitiveness of the nitrate of silver bath by rendering it acid; and for these reasons I generally give the preference to cadmium collodion.

Sometimes collodion exhibits a reticulated structure after the photograph has dried, which materially militates against the beauty of the picture, and prevents its being highly magnified; it occasionally happens that this defect cannot be cured, in which case the collodion should be rejected. I have generally found, however, that this "craping" may be obviated if the collodion be diluted, more or less, with a mixture of two parts of ether and one part of alcohol when it is being sensitised, care being taken to add as much of the solution of iodide in relation to the diluting liquids as would have to be added to an equal volume of collodion.

After using collodion for several evenings, it is well to allow it to stand for some days, and to decant about three-fourths into a fresh vessel.

Before pouring the collodion on to the glass plate, the usual precaution of cleaning away with the fingers any dried collodion from the lip of the containing vessel must be attended to; moreover, each time, just in the act of pouring, a few drops should be allowed to fall to waste on the floor; by attention to these remarks much vexation will be avoided.

Exposure of the Plate in the Telescope.—On taking the plate from the nitrate of silver bath it is desirable to drain it well before it is put into the slide, first on the edge of the bath, then on white blotting-paper, shifting its position two or three times, but always keeping the same point downwards. It must be carried to the telescope as quickly as possible, and the picture developed immediately after it has been removed from it.

The sensitised plate rests on angles of pure silver, let into the square plate-holder, or in the circular plate-holder within a ring of pure silver, the face resting on three prominent places. I have found that contact with wood is liable to produce stains which occasionally extend across the plate during the development. The

circular plate-holder is entirely of metal, and I would recommend metal holders in preference to those of wood for celestial photography, because they are not liable to warp and become set from damp when left in the observatory. The plate-holder should be wiped with a clean cloth after each operation, and the hands also washed each time before a fresh plate is taken, on which it is intended to pour collodion.

In order to subject the sensitised plate to the action of light when the telescope is used as a Newtonian, I remove a very light cover, previously placed over the mouth of the telescope, and replace it when I wish to discontinue the action; this cover is made of black merino, stretched on a whalebone hoop, and is provided with a handle of bamboo. In the direct method, I turn up or down, through an arc of 90°, a little hinged trap, interposed between the great mirror and the sensitive plate. This motion is given by means of a lever fixed on a light axis, supported by the arm which holds the small camera; the axis extending beyond the edge of the telescope tube, and carrying a milled head by which it is turned.

Regulation of the Time of Exposure.—A journeyman-clock, beating seconds distinctly, should be near the telescope, in order that the operator may be enabled to regulate the time of exposure, which requires great nicety with such sensitive chemicals as must be employed.

The time occupied in taking lunar pictures varies considerably; it depends on the sensitiveness of the chemicals, on the temperature, on the altitude of the moon and her phase. An almost imperceptible mist in the atmosphere will sometimes double the time of exposure, but, curiously enough, a bright fleecy cloud passing over the moon scarcely stops any of the actinic rays. I have recently produced an instantaneous picture of the full moon, and usually get strong pictures of the moon in that phase in from one to five seconds. The moon as a crescent, under like circumstances, would require about twenty to thirty seconds, in order to obtain a picture of all the parts visible towards the dark limb.

Development of the Picture.—Of all the developing mixtures tried I give the preference to the aceto-pyrogallic acid solution, which is generally used in the ordinary proportions: namely, pyrogallic acid, three grains; glacial acetic acid, one fluid drachm; distilled water, three fluid ounces; but, in cold weather, I sometimes reduce the quantity of acetic acid to one half, to render the solution more active. The developing fluid retains its properties for a week or more after mixing. It is desirable to pour out the requisite quantity of fluid in a small vessel, and to place it in readiness, before the plate is removed from the bath and put into the slide, so as to prevent any delay after the plate has been exposed in the telescope. This precaution obviates the staining which arises sometimes by partial drying of the film.

The addition of nitrate of silver to aid in bringing out the picture must be avoided; pictures thus intensified will not bear any magnifying power, and are comparatively worthless. Hence it will be seen how all-important it is to have the bath and collodion in their most sensitive condition. The negative should not be developed too strongly, as such pictures never copy so well as those moderately but distinctly brought out. Such small photographic pictures as those of Jupiter and Saturn present many obstacles to their development, on account of the difficulty of discerning them during the operation; for the focal image of Jupiter in my telescope, even when the planet is in opposition, is only about $\frac{1}{37}$th of an inch in diameter.

After the development of the picture to the desired point, the further development is arrested by pouring a quantity of water on the plate, and a vessel containing water should be at hand for this purpose.

Fixing the Picture.—By preference I use hyposulphite of soda for fixing; after fixing, the plate is washed under the tap of a cistern of water for a short time, and then examined with a lens. If worth retaining, the epoch of the picture, and other particulars are recorded at the back with a writing diamond. The plate is then washed again, front and back, in a stream of water, and placed face upwards on a tripod stand, duly levelled; rain-water* is poured on the collodion, and from time to time this is poured off, and fresh poured on, in the meantime other photographs are proceeded with. After half an hour or more, the plate is thoroughly washed in a stream of rain-water, and placed edgewise on blotting-paper against the wall, to drain and dry.

Varnishing.—The next morning the negatives are warmed before a fire, and varnished with Sœhnée's varnish,† which is the only description I have found to stand. I am careful to filter the varnish before using, otherwise specks might be transferred to the photograph. It is very desirable to varnish the plates as soon as they are dry, for, if left unvarnished for any length of time, they can never be varnished evenly.

(To be continued.)

* In preparing the bath and developing solutions, distilled water must be employed, but filtered rain-water answers very well for washing the photographs.

† Sold by Messrs. Gaudin, 5, Sermon Lane, Doctor's Commons, London.

ON THE CHLORIDES OF GOLD AND THEIR EMPLOYMENT IN PHOTOGRAPHY.

By M. Fordos.

The gold baths employed in photography are prepared by adding to a solution of hyposulphite of soda either a solution of *sel d'or* (hyposulphite of soda and gold) or a solution of chloride of gold. But it is very wisely recommended not to make use of an acid chloride, but of a perfectly neutral chloride of gold. Now all the chlorides of gold are more or less acid; and the constant presence of acid in these products, even the best prepared, led me to think there might be some advantage in studying the preparation of this compound, and by this study I have arrived at results very beneficial to the art of photography.

The prescribed mode of preparing chloride of gold is very simple, but it does not furnish a pure neutral chloride of the formula

$$Au \cdot Cl_3$$

The following experiment will serve to explain the different stages of preparation, as well as the variable results to which they inevitably lead:—

When twenty-five parts of gold are dissolved in a mixture of twenty-five parts nitric acid and seventy-five parts of hydrochloric acid, and the solution evaporated at a gentle heat in a weighed capsule, the following facts may be observed:—the solution is orange yellow, and disengages abundant acid vapours, and the liquid is reduced to between fifty-one and fifty-two parts. At this moment the liquid begins to deepen in colour, and the disengagement of acid vapours appears to cease. If the capsule be then withdrawn from the fire, the liquid soon becomes a crystalline mass formed of long needles. In this manner we obtain a hydrated hydrochlorate of chloride of gold, and this is the purest commercial product. If, instead of withdrawing the capsule from the fire, it is continued thereon at a gentle heat, it slowly disengages invisible acid vapours, but at the same time a part of the perchloride is transformed into protochloride; and in endeavouring thus to free the chloride of gold from its excess of acid, we eventually obtain a product which contains protochloride in proportion as the heat has been continued. The chloride obtained in this way is of a ruby red, more or less deep. It is not completely soluble in water, and when treated by that liquid we see the protochloride of gold separate under the form of a yellowish white powder; but this protochloride soon transforms itself into perchloride by parting with some of its gold.

This experiment shows that in the preparation of chloride of gold we are placed between two dangers: we obtain either an acid chloride or a chloride containing protochloride. Photographers should abandon the use of chlorides of gold thus obtained, because they are of uncertain composition, and, besides, they are always acid. We may add, that they are so hygroscopic that this property renders them very difficult to manipulate.

We believe that photographers will find many advantages in employing the double chlorides of gold and potassium, and of gold and sodium. These double chlorides contain as much gold as the commercial chlorides of gold, and may be employed in the same doses. They are neutral, and have an invariable constitution. They possess great stability, and do not attract moisture from the atmosphere. Photographers might buy these chlorides by the half ounce or ounce: it will always be easy to weigh the quantities required for each operation, without the fear of the salt liquifying and rendering the weighing difficult.

THE ACTION OF LIGHT ON THE COLOURING MATTER FROM THE "MUREX."

The photogenic properties of the mollusk, from which the ancients are supposed to have obtained their famed Tyrean purple-dye, have some time since, been investigated by M. Lacaze Duthiers, who submitted a very elaborate memoir on this curious and interesting subject to the *Academie des Sciences.* In the first place it is necessary to premise that the term *purple* has, at various periods in the world's history, been applied to various colours more or less red. Strictly speaking, it should be restricted to the pure

secondary colour of the prismatic spectrum composed of pure red and pure blue, in which the blue is in greater proportion than it is in violet, which may be considered as composed of equal quantities of pure prismatic blue and red.

M. Duthiers's researches have been directed to several species of *murex* and *purpura*. Anatomical investigation shows that the purple colouring matter is primarily a colourless substance produced by a very limited portion of the *mantle* of the animal, occupying the small space between the branchiæ and the rectum. It forms neither a pouch, a sack, nor a reservoir, as frequently asserted, nor even a purple vein, but is merely spread over the surface of the mantle. Its tissue is composed of large elongated cells placed beside each other, perpendicularly to the surface of the pallial arch, in the direction of its greatest diameter. When they have arrived at maturity these cells fall into the pallial cavity, swell by endosmose, break, and mingle their contents with other mucosities. This fall of the elements, isolated and independent, constitutes the secretion of the purple matter, at first colourless, white, or slightly yellow, in the living animal, but which, submitted to the sun's rays in conjunction with moisture, become of a fine violet colour.

The action of light develops the three primary colours in the following order:—Yellow, blue, red. Between these we find green resulting from the mixture of yellow with blue, and violet resulting from mixture of blue with red. In making the experiment slowly—that is, in diffused light—this succession of colours may be distinctly observed. But while the yellow disappears when the action of light is prolonged, the blue always remains in notable quantity—so that the red is never found (naturally) alone, and the hue of the purple is always more or less violet.

These properties are placed beyond the reach of doubt by the possibility of producing photographs upon silk or woollen tissues; and the results obtained without exhibiting the perfection of ordinary photographs exhibit, nevertheless, good detail and vigorous tones.

In a photographic image thus obtained we recognise some of the colours mentioned above. The greenish yellow corresponds to white, and the violet, more or less deep, to the blacks of ordinary photographs.

Different species of the *murex* yield different hues. From the *Murex trunculus* a blue is obtained, almost devoid of red or of violet.

The esteem in which this pigment was held was doubtless partly due to the source from whence it was derived. Developed by the agency of light, light would not cause it to fade, as it does so many other pigments. It would remain always brilliant, even under the luminous dazzling skies of Italy and the East.

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.

Report of the Committee, consisting of Messrs. Maskelyne, Hadow, Hardwich, *and* Llewelyn.

(Continued from page 238.)

But if the tissue of the paper is not to be altogether excluded from the list of possible co-operative agents present in these processes, there are other substances of which the influence can be demonstrated in a manner quite satisfactory to the photographist. Gelatine as size was long employed without his being conscious of its importance; and he now uses albumen as a photographic glaze, and sometimes other substances, such as grape sugar, Iceland moss, caseine, &c., on account of the fine tones and permanence in the fixing bath which they impart to his pictures. Gelatine and albumen both combine with nitrate of silver; and the character of the combination is one which chemistry has yet to explain with completeness. These compounds differ from each other in many important respects: we shall select that with gelatine for illustration. The characters of the compound of gelatine and nitrate of silver are exhibited by the following statements:—

If a sheet of transparent gelatine be floated upon a solution of nitrate of silver, the solution loses a considerable amount of the dissolved salt. When the proportion of the gelatine to the bulk and strength of the solution is sufficient, free nitrate of silver is scarcely to be detected in the bath, and what silver is found there is probably in the form of a gelatine compound, which is not entirely insoluble. The gelatine mass, though but slightly soluble in cold, is so to a considerable amount in hot water, and retains at once the neutrality and the taste of the nitrate. The solution gives the following reactions:—

Caustic potash throws down a bulky olive-brown precipitate, which clots into a tough extensile mass. This dissolves by boiling with excess of the precipitant, yielding a very dark and, when diluted, a clear yellowish-brown solution.

Strong ammonia produces no precipitate, but on boiling forms a pale orange-yellow solution, on which the light produces little or no change.

Chloride of ammonium, introduced cautiously, produces no precipitate, but in excess renders the solution turbid. The clear liquid is not rendered turbid by boiling; but a few drops of nitric acid, if the temperature be raised to the boiling point, suffice to render it milky from separation of the chloride of silver, which may be redissolved by ammonia, or darkened by the light.

Iodide of potassium, unless carefully introduced, throws down a turbidity of a yellow tint in it. But if this be removed by filtration, it will be found that the addition of the most dilute nitric acid and boiling throws down a fresh amount of iodide of silver.

Cold nitric acid produces no change in the gelatino-nitrate (?) of silver, even when formed from the ordinary commercial gelatine; but boiling throws down sometimes a small quantity of chloride, originating in the impurity of that body.

Chlorhydric acid, in minute quantity, produces also no precipitate until boiled, when the chloride of silver separates from the compound.

The gelatinous mass, formed by the action of the nitrate of silver solution upon the gelatine, becomes, on exposure to the sunlight, of a red colour. The change is a rapid one, and is accompanied by a shrinking of the mass to its original character of a thin sheet as it dries. The colour attained by prolonged solar influence is by transmitted light a deep ruby, and a "bronzed" green by reflected light. Sheets of the gelatino-nitrate of silver thus solarised no longer swell up or dissolve in boiling water, but only after long boiling become disintegrated in filmy fragments. Potash gives, on boiling, a clear solution, which even when dilute is brownish-red, and appears opaque when concentrated. Ammonia added to this liquid diminishes its opacity, and gives it an orange hue.

In inquiring what the character of the change effected in these bodies is, we would direct attention to a process analogous to that by which the citrate of silver was examined. If hydrogen be freely passed over the albuminate of silver in a water bath, this becomes converted into a red body resembling in all essential particulars the red substance into which the light converts the same albuminate. In each case the reaction with the different tests is the same. That, in fact, a suboxide is in each case formed, and that this suboxide is in combination with the albuminous or gelatinous substance, seems the natural conclusion from what has preceded, no less than from the reactions of the bodies themselves.

The silver cannot be there in the metallic form; else, why should potash dissolve it? and why should ammonia convert it into a paler body? Moreover, metallic mercury does not amalgamate with it. One reaction, indeed, might be urged as militating against this view. The hyposulphite of soda has but little action on the red compound, whereas it dissevers the constituent elements of suboxide of silver as dissolved oxide of silver and residuary metal. But we have shown that silver is not entirely precipitated from its gelatinous nor from its albuminous compound by such tests as chlorides or iodides, and one will hardly therefore see with wonder that the albuminate or gelatinate of the suboxide resists the action of the alkaline hyposulphite. Nor would it be out of place here to hint, as our colleague, Mr. Hardwich, has done, at the high probability of the suboxide of silver associating itself with organic substances, such as cellulose, albumen, gelatine, &c., in a manner analogous to that in which other metallic salts, in which the metallic element is not entirely saturated by metalloid elements, act the part of conjugate bodies, annexing themselves to the organic substances alluded to, and to colouring matters of various kinds. The action of these mordants belongs still to an obscure chapter of chemistry, but it is highly probable that the compounds under consideration are closely allied to them.

Finally, we have to bear in mind that the fixing agent modifies the image formed by the light in the materials we have been considering.

The alkaline hyposulphite, like ammonia, acts on the subchloride or the suboxide of silver, splitting the one into metallic silver and chloride which becomes dissolved, and the other into oxide and metal.

Obviously the conversion of an image formed of either of the intensely colorific subcompounds of silver into a pale metallic deposit containing only half the amount of metal, and possessing

none of the remarkable colorific energy of the suboxide or subchloride, is a conversion that can only be expected to exhibit a great loss of tone. Practically the singular immunity from this dissevering action which the organic matter, combined with or conjugated to the subcompound of silver, extends to that subcompound, comes in to help the photographist from losing the beautiful result which the light itself produces. And what little he still must lose he can almost restore again by the remarkable toning methods which he has recourse to.

The rationale of these toning methods is to be sought in the chemistry of each different process. The deposit of gold from a solution of that metal is in its broad features a simple reaction—a deposit of a more electro-positive metal in substitution of one less so; but the precise details of each method of using a gold toning-bath doubtless involve more refined chemical explanations. Without attempting to go into these, we would invite attention, however, to the sulphuretting baths by which this toning is sometimes conferred on the pictures. Sulphide of ammonium converts the fixed image on paper into, first, an intensely black compound, and subsequently, by its continued action, into a dull yellowish, scarcely visible stain. The latter, there can be little doubt, is sulphide of silver. It seems highly probable that the intermediate step in the process is the production of a subsulphide, and that it is at that stage that the progress of sulphurising is arrested in a successfully-toned picture. This explanation would be quite in harmony with the conditions under which the toning is performed.

The results, then, at which we conceive that photographic chemistry may be said to have now arrived, in respect to the direct processes involving the use of silver salts, may be thus stated.

The materials employed perform various functions:—

1st. One of these is that of supporting the picture, as a mechanical material or basis for holding the chemical bodies. Of the substances so employed the tissue of paper is one. Pyroxyline (the product of a substitution effected in the elements of the cellulose) is spread on glass to afford another. The latter appears to be inert. The former, on the other hand, seems to aid in the reduction, and possibly, in some cases, to remain in union with the reduced result.

2ndly. The silver salts employed, whereof the chloride—for which may be substituted other salts, as the tribasic phosphate, the tartrate, the citrate, and many others, though each with a specific effect—appears to act by imparting *sensitiveness*. The nitrate, on the other hand, is present in excess to keep up a constant succession of sensitive material, and so to give *vigour* and *intensity* to the image.

3rdly. Gelatine as a size, or albumen as a glaze, and various other substitutes for these (though but little linked together by any chemical analogy amongst themselves) co-operate by conferring *rich tints* and deep tones, while they at once impart to the image formed on them an immunity from the destroying action of the fixing process, and form a mechanical surface more or less impenetrable, which prevents the other sensitive compounds from sinking into the paper.

Each of these substances can, provided nitrate of silver be present, be employed to produce an image. Thus, the chloride rapidly produces a faint picture; the "gelatino-nitrate" slowly yields an intense one; together they produce the required result. Whether that result is a cumulative one, the sum of the separate results, or a conjoint one produced by a combination of the chloride with the gelatine compound, it were difficult to say.

The image is, however, a mixed one, for treatment of it with dilute nitric acid leaves the slaty violet subchloride of silver. It seems, therefore, to be a mixture of subchloride with a gelatinous, and perhaps, also, a cellulose-compound of suboxide of silver.

The next great division of our subject which we have to enter upon is that of photographs produced by development.

Fortunately, in dealing with the images thus formed, we are able to dissever the results from the magic influence that calls them into being. We need only show that certain conditions are necessary for the impress of the invisible image; we are not called on to explain the character of the impress itself. Without attempting to explain what goes on in the camera obscura, we may determine the conditions for a favourable action in it, and interpret the results of that action after development; though even here, from the great delicacy of the processes employed, the task is a most difficult one.

With regard then, first, to the preparatory portion of these processes involving the production of the sensitive surface. This consists, in the processes on glass, in a supporting film, and generally in iodide of silver formed under conditions in which nitrate of silver was in excess. There are also generally present other ingredients, such as certain forms of organic matter, and in some cases bromide or even chloride of silver.

That it is not a matter of indifference whether the supporting basis, or film, consist of pyroxyline, or albumen, or gelatine, or of these severally combined with other bodies or with each other, one might readily suppose from what has been already said under the head of direct processes; and it will be no difficult matter to show more than a probability that this is not due to a "molecular," but to a "chemical" distinction in the action of these bodies.

(To be continued.)

OBSERVATIONS ON THE TINCTORIAL PROPERTIES OF ALBUMEN.

By M. Guignet.

These observations have been conducted upon a cotton fabric impressed with albumen, and exposed to steam, so as to coagulate the albumen.

In the albumenised parts, the cotton readily takes certain dyes which wool and silk do not take: it becomes tinted yellow by picric acid, and red by fuchsine, &c.

This property has been known and applied a long time in factories. I have observed certain facts which reveal new tinctorial properties in albumen, which the industrial arts will, doubtless, also turn to account.

A fabric printed with albumen is quickly moistened in pure water, except the albumenised parts, which are penetrated by the water very slowly.

If a liquid, insoluble in water, is added to the water, and stirred briskly, this liquid will go only to the albumenised parts and tinge them, if it contains a colouring matter of a suitable nature. For example:—Water and a fat oil holding alkanet in solution: water and crude aniline (which tinges albumen brown), &c. Aqueous solution of iodine tinges albumen yellow. In contact with water holding starch in suspension, this yellow tint becomes green, then blue, and disappears entirely. The iodine leaves the albumen to go to the starch, and the blue colouring becomes imperceptible in the mass.

Neutral chromate of potassa gives no tinge to albumen; but the bichromate, or a diluted solution of chromic acid, tinges it yellow.

Albumen also assumes a vivid citron yellow colour in a solution of acetate of lead; red in a strong solution of nitrate of silver; black in a bath of logwood.

Permanganate of potassa tinges albumen brown, without tinging the non-albumenised parts.

Albumen is tinged a pale yellow brown in a boiling solution of a salt of the peroxide of iron. Prepared in this manner, it assumes a *blue* colour with ferrid cyanide of potassium—*violet* with decoction of madder—*black* with logwood, &c.

In a solution of sulphate of copper, albumen acquires no tinge; but it is coloured blue in a solution of ammoniacal sulphate of copper. By the action of alkalis, this blue tint becomes a very vivid violet lilac. With ferrid cyanide of potassium the marron-red tint of ferrid cyanide of copper is obtained. Ammoniacal solution of cobalt also tinges albumen.

The salts of gold, platinum, and palladium, also tinge albumen yellow without affecting the non-albumenised tissue. Albumen tinged with chloride of gold becomes of a deep violet, almost black with protochloride of tin or protosulphate of iron. Albumen tinged with chloride of platinum is coloured of a vivid yellow brown with protochloride of tin.

Finally, as might easily have been foreseen, albumen printed upon cotton also fixes bichloride of mercury, and assumes the scarlet hue of bin-iodide of mercury when treated with a very dilute solution of iodide of potassium.

ON THE DISCOLOURATION OF SILVER BATHS BY ALBUMENISED PAPER.

By J. B. Cassan.

In seeking to avoid the annoyance of losing silver baths which become decomposed in sensitising positive albumenised paper, I believe I have found a method at once simple, expeditious, and efficacious.

Nitrate of silver renders albumen insoluble; still, in coagulating, this albumen leaves some organic matter dissolved in the bath, which gradually alters it, and soon renders it unfit for use.

Whenever an albumenised surface is put into contact with a silver bath, the latter becomes yellow, and consequently almost lost, if the albumen be not previously coagulated.

To lessen the deterioration of the positive baths, some operators place the albumenised papers under a protecting sheet of paper, and coagulate the albumen by passing a hot iron over it.

Others apply the back of the sheets of paper to boiling water.

This last method, although excellent in theory, cannot be employed; because it takes a long time to prepare a few papers, and it is difficult to prevent the boiling water from moistening the albumened surface, and the paper must be dried again before it can be sensitised.

The same objections apply to the employment of a hot iron: for if it be too hot, the paper becomes scorched; and if it is not warm enough, the organic matter of the albumen will become soluble in the nitrate bath. And it is difficult to supply with the iron an equal amount of heat over the entire surface of the paper.

The method I propose consists in simply coagulating the albumen by putting it into a tin box, and placing the box, securely covered, in a vessel of boiling water, and kept there a sufficient length of time. There is no inconvenience to be feared from too long an immersion.

If the box be sufficiently large, as much as one or two quires of paper may be prepared at once, as the heat soon penetrates the entire mass of the paper.

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

(Continued from page 240.)

Thus it is that, on placing printed proofs in the hyposulphite bath, many reactions may be successively produced, according to the amount of silver that is prescribed to the hyposulphite. Besides, it is proved by experience that these reactions will be exactly the same whether the nitrate or chloride is under consideration, only they will be more rapid with the first than the second. At first, a part of the hyposulphite acting upon the silver salt forms hyposulphite of silver $Ag\,O\,S^2\,O^2$; but the latter, encountering an excess of the soda salt, forms immediately the double salt $Ag\,O\,S^2\,O^2\,(Na\,O\,S^2\,O^2)\,2$, which, being very soluble in water, and particularly in hyposulphite, is immediately dissolved. Consider, for instance, the case of a proof previously washed in water, and nothing but chloride of silver retained. The following formula will explain the reaction that occurs:—

$$(\beta) \qquad 3\,S^2\,O^2\,Na\,O,\,5\,HO + Ag\,Cl$$
$$= 2\,(S^2\,O^2\,Na\,O)\,S^2\,O^2\,Ag\,O + Na\,Cl + 5\,HO.$$

This salt once formed, if some fresh proofs and, consequently, fresh quantities of chloride of silver are added to the solution previously obtained, the salt $Ag\,O\,S^2\,O^2,\,(Na\,O\,S^2\,O^2)\,2$, tends to form the compound $Ag\,O\,S^2\,O^2,\,Na\,O\,S^2\,O^2$ after the reaction—

$$(\gamma) \qquad 2\,(S^2\,O^2\,Na\,O)^2,\,S^2\,O^2\,Ag\,O + Ag\,Cl$$
$$= 3\,(S^2\,O^2\,Na\,O)\,(S^2\,O^2\,Ag\,O) + Na\,Cl.$$

But this compound $(S^2\,O^2\,Na\,O)\,(S^2\,O^2\,Ag\,O)$ is insoluble in water, and, therefore, tends to deposit itself in a crystalline state on the sides of the vessel in use, if the liquid is allowed to rest, or in a pulverulent state, in the texture of the paper, or in the liquid, if, as is the case in ordinary fixing, the liquid is frequently stirred.

From this time considerable danger is manifest. On one hand, in fact, as shown in defining the double salt, it is, in the mass of water, very easily decomposable into sulphide of silver and sulphuric acid, susceptible of engendering a deposit of sulphur; on the other hand, if we place this salt in the presence of a fresh quantity of the silver salt it will form free hyposulphite of silver.

$$(\delta) \qquad (S^2\,O^2\,Na\,O)\,(S^2\,O^2\,Ag\,O) + Ag\,Cl$$
$$= (S^2\,O^2\,Ag\,O)\,2 + Na\,Cl;$$

and, as we already know, this hyposulphite of silver immediately shows an inclination to decompose after the reaction—

$$S^2\,O^2\,Ag\,O + H\,O = Ag\,S + S\,O_3\,H\,O.$$

The preceding reactions are only clearly established when to the same quantity of hyposulphite indefinite quantities of chloride of silver are added, and there exists a limit of saturation in the solubility of the latter which it is important to determine. In short, the question may be stated in these terms:—

Whenever the fixing of hyposulphite of soda is made under such conditions that the hyposulphite of silver, or the second double salt $(S^2\,O^2\,Ag\,O)\,(S^2\,O^2\,Na\,O)$, exists for a short time in contact with the proof, without the power to dissolve in an excess of hyposulphite, it will be decomposed in the tissue of the sheet of paper, according to the reaction *(a)*, and in consequence of the formation of sulphuric acid, gives rise to the decomposition of one equivalent,

$$(\beta) \qquad S\,O^3 + S^2O^2\,Na\,O = S\,O^3,\,Na\,O + S\,O^2 + S.$$

The sulphur thus formed is deposited on the proof, side by side with the sulphide of silver, so that, not only one part of the silver covering the proof will be sulphurised on removal from the bath, but it will also imbibe a second quantity of silver, which, by degrees, sulphurising the unaltered silver, will attack the proof, and cause it to undergo a very considerable sulphurisation.

To seek out the conditions under which these accidents can be produced is that which must now occupy our attention.

Some are accidental; others are produced normally when the same bath is employed for fixing too great a number of proofs. We will examine each successively.

When a proof, on being taken from the printing frame, is plunged directly into the fixing bath, it should be immediately stirred, and this repeated every now and then. This precaution becomes of the greatest importance if the proof has not been washed in water, and thus retains nitrate. Reasoning indicates and experience proves that the *soluble* nitrate of silver acts upon the hyposulphite more rapidly than the *insoluble* chloride. Without this, a very great quantity of hyposulphite of silver would be formed in contact with the proof, and, not encountering a sufficient quantity of hyposulphite of soda to dissolve it, is precipitated, and afterwards decomposed: therefore we may come to this conclusion:—

If a large number of proofs are placed in the same bath almost in contact, without being separated by a sufficient space, so that, on agitating the dish, the hyposulphite of soda cannot flow between each sheet, the same accident presents itself in this instance as in the first, and the proof will very probably be spoilt.

An accident of the same kind, but confined to one spot, is produced if an air-bubble insinuates itself between the sheets whilst being fixed. Then the hyposulphite of soda, being raised by capillary attraction through the fibres of the paper corresponding to the size of the air-bubble, will form in the same place hyposulphite of silver, which, not being dissolved, is immediately decomposed on the part, and forms those yellow stains which photographers know too well.

We will now take into consideration the normal cause of the decomposition of the hyposulphite bath — that is to say, the saturation of this salt by silver compounds. From what has been previously stated, this limit of saturation is easily determined. Thus, from what has been shown in the preceding reactions, the danger is not to be apprehended but at the moment the insoluble and easily decomposable compound $(Ag\,O\,S^2\,O^2)\,(Na\,O\,S^2\,O^2)$ is on the point of being formed. But this moment is easy to define — it results from the two reactions (β) and (γ), which, combined, can be explained in the following manner:—

$$S^2\,O^2\,Na\,O,\,5\,H\,O + Ag\,Cl$$
$$= S^2\,O^2\,Ag\,O,\,S^2\,O^2\,Na\,O + Na\,Cl + 5\,H\,O.$$

If the preceding formula be calculated, we shall find that for this reaction to occur it will be necessary to introduce 100 hyposulphite of soda and 38 chloride of silver. It is, therefore, only when the hyposulphite employed shall have dissolved about one-third of its weight of chloride of silver, that the proof will incur the risk of being charged with sulphur.*

This is certainly a large proportion: photographers never attain it, for it corresponds to the fixing of fifteen whole sheets in thirty-five ounces of a solution of hyposulphite of ten per cent. Thus it would be difficult to understand the rapid alteration of the fixing bath if a new and very important cause did not intervene to hasten their decomposition. We have to speak of the action of light.

The Action of Light.—If we dissolve chloride of silver in a solution of hyposulphite of soda in very various proportions, from the one hundredth of its weight until the point of saturation is greatly exceeded, that is to say, the third of its weight [in the latter case, it will be found much of the crystallised salt $(Ag\,O\,S^2\,O^2)\,(Na\,O\,S_2\,O^2)$ will be precipitated]; and if we divide each of the solutions into two parts, and expose the half of each to the action of light, whilst the other half is kept in total darkness, we find that at the expiration of a certain period, varying from some hours to many days, all the solutions exposed to the light become troubled and decomposed, depositing sulphide of silver.

On the other hand, those which have been protected from light

* In practice, it will be understood that, on employing hyposulphite of soda, saturated with silver, the quantity of hyposulphite necessary for fixing is disseminated through a great quantity of water, and can act but feebly; while the silver salt is present in excess, as it were, upon a point, and cannot effect a rapid decomposition whilst the hyposulphite is super-saturated.

are not affected, even after the expiration of four or five months, but remain as limpid as at the time of their preparation.

This action of light, hitherto unknown, presents an aspect of the decomposition of the bath of the greatest importance; this, moreover, is so marked that in a room into which only yellow light is admitted, it ultimately makes itself felt, though in a much inferior degree than in full light. It is to this, much more than to the limit of saturation of the hyposulphite bath by silver compounds, that those solutions are due to which photographers give the name of "old hypo.;" and these solutions, as we have already shown in our preceding memoirs, are nothing else than agents in sulphurising the proof, and must in consequence induce, sooner or later, its alteration.

It follows that those photographers who are desirous of producing permanent proofs will perceive the necessity for fresh precautions, which we may sum up in the following manner:—

1. Operate as much in diffused and not in full light as possible, covering the dish in which the proofs are fixed with a mill-board or any other substance capable of intercepting the luminous rays.
2. Never employ the same portion of hyposulphite solution more than once.

A few words will suffice to explain the motive and value of these new precautions.

With regard to the first point: The light acts with such rapidity upon the solutions of hyposulphite of silver in hyposulphite of soda, that if they are concentrated, a few hours will suffice to render a precipitate of sulphide of silver perceptible. Now this precipitate, which forms in the midst of the liquor with great rapidity, is formed in contact with the printed proof. The extremely rapid decomposition of the double hyposulphite $S^2 O^2 Na O, S^2 O^2 Ag O$ in presence of water and under the action of light, is in our opinion an excellent proof. There is, therefore, a decided danger in having, even for a few hours, a fixing bath exposed to the action of light, especially if the latter is energetic, and the bath is already charged with silver salts. In fact, in this case the hyposulphite of silver, by its decomposition, causes in the very substance of the paper an almost simultaneous deposit of sulphide of silver and sulphur, which, in a manner more or less rapid, must influence its permanency.

As to the second point, it is perhaps more important than the first. Under the influence of the solar rays the solution of the silver salt in hyposulphite of soda undergoes, as we have shown, a decomposition; but if once commenced in the light this action seems to continue in the dark. Chemical analysis supplies a reason for this fact. On examining with care the composition of baths that have been exposed to the light, we discover that the precipitation of sulphide of silver is accompanied by the formation of acids of the thionic series, which, in the first instance, saturating the decomposed hyposulphite of soda, are not slow in becoming decomposed themselves, and give rise to fresh quantities of sulphide of silver, which, depositing in a successive and continuous manner, finish by removing from the bath all the silver it contains. Thus a fixing bath, containing salts of silver, after being submitted to the action of light during several hours, produces in the dark sulphurising compounds, thionates which, on coming in contact with a fresh proof, will cause at least a partial sulphurisation of the latter.

The preceding consideration explain and justify—at least *we* so think—the precautions we have advised, and which consist, on the one hand, of protecting, as much as possible, the solution during the fixing from the action of light; on the other hand, of never employing the fixing bath more than once.

The last cause of the alteration of fixing baths, and consequently of the proofs immersed in them, is due to the addition to the bath of certain acids, such as acetic. This method, advised some years since, but now little followed, need not occupy much of our attention, although noticed in this paper. A fixing bath prepared in this matter must necessarily entail a deposit of sulphur on the proof after the reaction.

$$(\delta)\ C^4 H^4 O^4 + S^2 O^2 Na O = C^4 H^3 O^3 Na O + SO^2 + HO + S.$$

This deposit, which forms with a certain tardiness, is more or less considerable, according to the proportion of acid employed; but it is constant, and the simultaneous presence of sulphur and silver upon the proof must cause, in a greater or less length of time, an alteration in the latter. This process must, therefore, be absolutely rejected.

Therefore, without prejudging the practical conditions of fixing (of which we shall treat in a special paper hereafter), we may state on the present occasion that the proof, on being taken from the printing frame, must be first washed in water, which, removing all the free nitrate of silver, diminishes the quantity of silver salt to be presented to the hyposulphite, and in consequence economising the latter; that the washing the proof in salted water, to convert the nitrate into chloride, is superfluous, as it in no respect diminishes the quantity of silver placed in contact with the hyposulphite, and in consequence does not retard the moment of saturation; that a washing with a solution of bi-carbonate of soda may be substituted with advantage; finally, that the bath of hypo. must only be employed for a limited number of proofs, for, owing to its saturation, and especially to the influence of light, its solvent agency may, after a certain time, be replaced by a decomposing action.

We shall return to this subject when we establish the practical conditions for properly fixing the proof.

After our experiments, we may say that the double hyposulphite of soda and silver acquires, in the presence of certain salts, such as nitrate of potash, table salt, &c., a great stability, which thus is found to justify the recently-proposed practice of saturating the hyposulphite bath with common salt.

PHOTOGRAPHY BY ARTIFICIAL LIGHT.

M. Wulff adopts the following method in working by artificial light:—He coats the plate with a collodion of the following composition:—

Alcohol at 40° *(centegrade)*	300 parts *(by weight)*.
Ether at 60° "	100 "
Gun-cotton	2 "
Iodide of ammonium	4 "
Bromide of ammonium	3/5 "

sensitises with a bath of—

Distilled water	100 parts.
Nitrate of silver	7 "

and develops with—

Distilled water	1000 parts.
Sulphate of iron	100 "

He employs a lamp similar to that constructed by Mr. Moule; but, to obtain the best results, he finds it absolutely necessary to reflect the light on to the object by means of screens covered with linen, coloured blue or grey. The following is the formula of the pyrotechnic composition he employs:—

Pure and well-dried nitrate of potash	3000 parts.
Flour of sulphur	1000 "
Powdered sulphuret of antimony	200 "
Powdered red orpiment	400 "

These are well mixed and afterwards passed through a sieve. About six ounces of this composition is placed in the pan in the middle of the lantern. This quantity will burn from ten to fifteen seconds, being a sufficient time in which to obtain a proper impression; but by augmenting this quantity both the intensity of the light and its duration may be increased at will. After having placed the sitter by aid of a lamp, the shutter of the plate-frame is raised, and the cap of the lens removed immediately the pyrotechnic powder is lighted.

STEREOGRAPHS.

Reminiscences of Scottish Scenery, by W. Woodward, *of Nottingham.*

(Concluded from page 241.)

In the Jedburgh Abbey series we have some highly interesting specimens, including, as it does, not only the Abbey itself, but several picturesque views on the Jed. No. 161 is a view of Jedburgh Abbey from the south-east, and exhibits the entire building as seen from the road. It is a structure of dressed stone, and has similar characteristics to others in Scotland which we have already noticed; in fact, it would almost seem as if they were built expressly for the purpose of ultimately forming picturesque ruins.

In No. 164 we have The Nave, looking west, and in No. 165 The North Aisle. The latter being an exceedingly "telling" subject in the stereoscope, it will no doubt be a favourite.

No. 168, On the Jed, is a pretty little picturesque view across a bend of the river, with the Abbey in the distance, seen between the trees on either side, and two or three figures reclining on the grassy bank; but the effect is a little marred by over-development of the negative.

No. 169, Bridge over the Jed, would be described by our French brethren as "leaving nothing to be desired." The execution is equal to the subject depicted, and that is not according any mo-

derate amount of commendation, for it is truly an exquisite "bit." The water occupies the foreground of the picture, with a surface as smooth as that of a mirror, in which the trees, bank, bridge, and distant hills are beautifully reflected—not as a duplicate turned upside down, but in a charmingly suggestive manner, being broken up and obscured by masses of rock protruding from the bed of the river, clothed with the humble vegetation so prevalent in similar localities. The bridge is a mere wooden structure for the accommodation of foot-passengers. On the right is a precipitous bank, "with verdure clad;" on the left bank are some lofty oaks, and the river in the extreme distance loses itself in one of those charming ravines which are so numerous in the Scottish Highlands—another specimen of which we have in the next that we shall notice, No. 166, GLEN-BURN, which is a delightful conglomeration of winding paths on rocky banks, with specimens of the oak, ash, beech, wild-brier, and bramble, in charming and picturesque confusion.

KIRKSTALL ABBEY contributes four illustrations:—No. 125, as seen from the west, where a good idea of the general design is gained; No. 129, from the *hospitium*, where mere fragments of the foundation are nearly deposed from their position by the encroachments of their active opponents of the vegetable kingdom; No. 127, *The Nave*, looking east, an "interior out of doors," as Pat would call it; and No. 123, *The West Door*, which, *more Hibernice*, consists of an arched entrance partially closed by a gate.

Although not properly belonging to the series, we find a few amongst them are no doubt associated by the artist in his mind with the others, inasmuch as he probably took them on his way home from the far north. Of these we shall notice two as worthy of mention, viz.:—No. 134, the east window of ST. MARY'S ABBEY, YORK, and No. 130, YORK CATHEDRAL from the south. The latter especially deserves commendation, it being a capital view of all the most important features of York Minster.

We fear that, unless Mr. Woodward is more favoured than his brother photos, he will scarcely return from his present year's trip, should he have made one, with his bag so richly stored as after his last expedition.

GOVERNMENT IN COMPETITION WITH PROFESSIONAL PHOTOGRAPHERS.

WE have to call the attention of professional photographers to a question in which their interests are involved, viz., the propriety of a Government Department undertaking the production of photographs of national property at rates below that at which they could possibly be published through private enterprise. This arises through a parliamentary inquiry that has lately been instituted as to the general management of the South Kensington Museum, during which certain facts were elicited as to the system on which the photographic department of that institution is conducted. As, however, a decision of the House of Commons on the subject shelves the question for a season, we can only ventilate the matter meanwhile, in the hope of eliciting such a discussion of the points involved as may lead to an unanimity of opinion and a defined course of action amongst those interested when the time arrives again to open up the subject. On the present occasion we shall give *verbatim* that part of the "Report from the Select Committee on the South Kensington Museum" that relates to the photographic department—viz., Section 12—and analyse in detail the evidence laid before that committee on future occasions.

THE SELECT COMMITTEE HAVE AGREED TO THE FOLLOWING REPORT ON SECTION 12:—

"12. The collections of reproductions by photography and casting have been made primarily to furnish models for the use of the eighty art-schools in connexion with the department of science and art: they are obtained from public collections at home and abroad. After providing for the art-schools, it has been thought right to give the public at large the benefit of the photographs at cost price, for the promotion of general art-education. The science and art department express a desire to avoid any competition with professional photographers by limiting their sales to photographs taken from Government collections, to which, except in rare and special cases, the trade is not admitted; but it has been objected by one commercial firm, enjoying peculiar privileges of admission to collections, and by Mr. Fenton, a photographer of eminence, that even such a limited sale by the department is an improper interference with private enterprise.

"There is an obvious distinction between copying and photographing pictures and works of art belonging to the public. Copying is attended by no very serious inconveniences, while photography almost invariably requires the removal of the object, deprives the public of the exhibition of it, exposes it in the light, to the risks of breakage, rain, &c., which can only be guarded against by great vigilance, requires a special apparatus of considerable bulk, and uses chemicals which are always unpleasant, and often dangerous. Mr. Panizzi shows that the only fire ever known at the British Museum was caused by the negligence of a photographer. Under such circumstances all the witnesses agree that a general right to photograph cannot be conceded to all like the right to copy. Mr. Fairbairn stated, that at the Manchester Art Treasures Exhibition the photographic professors were pests, and that it was found absolutely necessary to limit the privilege to one person. In order to execute photographs in public collections there must be a monopoly somewhere. If it be proposed to grant this privilege to a limited number of competent persons, as was at one time the practice at the British Museum, the difficulty arises, which was felt by the trustees, of deciding who is competent. Mr. Panizzi considers it 'a very difficult thing to determine who is competent,' and the trustees were forced to say, 'We will only admit our own photographer.' For a public department to attempt to determine this question in the case of every application would lead to constant difficulties and heartburnings. Moreover, the favoured persons having the monopoly among them might league among themselves to make the public pay an unfair toll for the use of their own property. These objections would apply all the more strongly to the appointment of a single private individual or firm, as the monopoly would be all the closer. The experience obtained at the British Museum, as well as at the South Kensington Museum, has led to the conclusion that the only feasible course for public interests is to employ one responsible public officer; and by harmonious co-operation between these two departments, one photographer is employed for both. A tariff of moderate prices is published, at which the public may obtain negatives, and print positives for themselves. Any publisher may thus produce and publish, at his own prices, any object in the British Museum or the South Kensington Museum.

"As respects 'positives' of public objects, the sale of them by the department to the public is limited to objects in public collections which it is not permitted to private enterprise to photograph, and to a price only covering the cost of production. Your committee consider that there is no other course so free from objections or so good for the public at large as the present system of the department. The printing of photographs stands on the same footing as the printing of parliamentary papers, and the publishers might, as well as the photographers, complain of the low price at which they are sold. If the price were increased, there is no doubt that the sales would be greatly diminished, and the spread of knowledge of parliamentary proceedings arrested. The trustees of the British Museum attempted to supply the public with photographs of objects in the British Museum, at the same time allowing their photographer the privilege of publishing, but they abandoned the system after considerable losses.

"Your committee have investigated fully a complaint of Mr. Scott, in respect of the photographs taken by him from Raffaelle's Cartoons. Mr. Scott complains that Mr. Caldesi was obstructed by the officer of the department of science and art in taking his photographs, and that he has been undersold by the department; but Mr. Redgrave proved that Messrs. Caldesi would have been unable to have produced any satisfactory photographs unless the department had permitted them to have the benefit of the removal of the Cartoons by their officer, and that as the sale of the Cartoons by the department cannot yet be said to be in operation, the apprehension of being undersold is at least premature. At any rate, the public have no reason to regret that Mr. Scott's suggestion of vesting in his firm an absolute monopoly of the photographs of the Cartoons has not been complied with. The arrangement by which a private was joined to an official photographer, was almost sure to lead to disputes, and should not be repeated."

APPLICATION OF PHOTOGRAPHY IN THE CONSTRUCTION OF MICROMETERS.

By CLARENCE MORFIT, *of the United States Assay Office.*

THIS is merely the reduction of a large scale of exact dimensions and divisions to a definite size suitable for microscopic instruments. A scale of ten inches, divided into inches and tenths of an inch, has been reduced in this manner to one-twentieth of an inch; thus making its smallest divisions equal to one two-thousandth part of an inch square. The method is simple, accurate, and economical. Moreover, the micrometer has the advantage of giving the exact measurement of the object in fractions of an inch, and at the same time determines the power of the microscope itself.—*Silliman's Journal*, Vol. XXX., No. 88, page 156.

[Mr. Maltwood, we believe, was the first to apply photography to the production of micrometrical scales, and described his method of producing a "finder" in the *Quarterly Journal of Microscopical Science*, Vol. VI. 1858. *Transactions*, page 59.—ED.]

ON PRODUCING THE IDEA OF DISTANCE IN THE STEREOSCOPE.

By JOSEPH BECK.*

IN a view taken through the camera no immediate foreground can be introduced: thus we lose in the photograph an important element in nature for the appreciation of size and distance. In reproducing nature we ought to supply some substitute. This can easily be accomplished. Take an ordinary glass transparent view, and look carefully at it: in some instances the foreground absolutely appears to project into the instrument; and never is it so arranged that the idea of the distance of the foreground of the picture from the edge of the stereoscope is given. Take now a black mat or card, with two holes so cut in it, that when laid on the view the right eye can see more of the left-hand side of the right picture, and the left eye can see more of the right-hand side of the left picture. It will then be obvious that the eccentricity of this mat will indicate a difference of angle; and in proportion as this eccentricity is increased or decreased, so the picture appears to advance or recede from the stereoscope; and as the view recedes and distance is given, so the appearance of the real size of nature is obtained.

If the plan is reversed, and the mat is cut so that the right eye sees less of the left-hand side of the right picture than the left eye, we can produce the appearance of the object standing up in the instrument, and in proportion as it approaches the stereoscope, so the size is decreased. In these cases there is no difference in the angle at which the pictures are taken, and yet such vast differences in the apparent size of the picture, showing that whilst the amount of difference of angle is a matter of comparatively but little consequence, the introduction of a prominent foreground, such as mentioned above, enables us to estimate the real size of the object viewed. The carrying out of this plan may be observed in the

* Abstract of paper read before the British Association, 1859, extracted from the official report, lately published.

mounting of Mr. Warren de la Rue's photographs of the moon. Had they been mounted in the centre of circles, they would have appeared as two-inch balls, with beautiful miniature volcanoes and mountain ranges traced upon the surface; but when mounted eccentrically, they immediately appear as floating far off in space, every hill and valley, mountain, volcano, or plain, assuming grand and imposing dimensions.

Letters to a Photographic Friend.

No. IV.

MY DEAR FRANK,

THEY say that short reckonings make long friendships; but I calculate that, in summing up my accounts with you, I run the risk of being cut for a bore, from the length to which they run; however, like a man of my word, at all hazards, I proceed to keep the promise contained in my last letter.

The next that I visited, after leaving Shew's, was Mr. Francis, of Great Russell Street, Bloomsbury. After examining the many ingenious and practical contrivances for which he is famed, including sliding cameras, bellows cameras, and stereoscopic cameras, portable tents, field boxes, clamp boards for plate cleaning, printing frames, steel rolling presses for putting a surface to paper proofs, polygonal lamp shades made of transparent photographs mounted in metal frames, and many little dodges too numerous to mention, I gave special attention to some glass dishes of very large size, which at once struck me as being very suitable for the preparation of life-sized photographs. The bottom and four sides, which are of glass, are very neatly and solidly cemented into a well-made iron frame: these may be made up to any size that glass is made to.

I also noticed a bath for a whole plate glass, of extraordinary lightness. It was made of thin mahogany, lined inside with pure sheet india-rubber; the top was arranged to be water-tight, and to hold a minimum of silver solution.

A packing-case, arranged to hold the camera, tent, and field box, was ingeniously contrived, so that it could readily be mounted on an axle carrying a pair of small wheels, and as readily unmounted, the axle-bar dropping into a groove across the bottom of the box, and then being fixed in position by two turn buttons, the legs of the tent serving as a handle whenever it may be desirable to push the "traps" before one.

Mr. Francis has so arranged a very neat little stereoscope that it folds up into a little box 1⅝ inches thick, to hold thirty slides.

Another arrangement, for holding a series of stereoscopic slides, consisted of a set of thirty frames, hinged on a central cylinder that rotated on an axle mounted in the centre of a drum-like case, into the upper part of which the two lenses were fitted obliquely, and in front of these a door opened to admit and reflect light upon the stereograph under examination. This contrivance is admirably suited for exhibiting stereographs in public places, or in class-rooms, where stereographs are used for educational purposes, and it is desirable to protect the slides from the handling of many inspectors.

Another contrivance was a frame wherewith visiting-card portraits are taken. It consisted of a frame divided into eight compartments, so that each in turn could be brought under the action of the lens by means of a double set of grooves at right angles to each other: by this means eight negatives may be taken rapidly in succession on one large plate. Of course, in printing sets of 50 or 100 visiting cards, a number of negatives are absolutely necessary.

Next in turn came Mr. Dallmeyer's new establishment, in Bloomsbury Street. Here I found an assortment of lenses suited for the general requirements of photographers, whether for portraits, groups, landscapes, or architectural views. In these the chemical and visual foci are coincident, and are free from aberration from the centre to the margin of the picture. The landscape lenses seem to be on the model of the late Mr. Andrew Ross, but the portrait lenses are constructed so that not only can they be used for views, architecture, and groups, by the introduction of suitable stops, but the front lens may be employed as a distinct view lens. The improvements Mr. Dallmeyer professes to have effected in this form of lens are:—

"*For Portraiture*—Greater rapidity of action over the whole plate, and nearly perfect flatness of field. *For Groups, Architectural Views, and Landscapes*—Perfect straightness of marginal lines, and a flat field; an increase of 15° in the angle of picture produced (this also expresses rapidity of action, and the so-called 'depth of focus'); greater universality of application of one instrument. Thus, for example, the No. 3 portrait lens, without any stop, will produce pictures on plates 6½ by 4¾; with a large size stop it may be used for groups on plates 8 by 6. With a smaller size stop it may be used for architectural views and landscapes (possessing the most perfect definition, flatness of field, and straightness of lines), on plates 10 by 8, which is equal to an angle of about 52°. By unscrewing the back combination, and replacing it by the front, it may be converted into an ordinary view lens, having a focal length of 16 to 18 inches, and capable of producing pictures 12 by 10. Every other size instrument has the same properties, and may be used in like manner."

It is recommended that a set of Waterhouse's diaphragms be used with each lens to obtain the above advantages.

His new stereoscopic lens is made after the same principle, and produces lines of perfect straightness upon a flat screen, with fine definition, and includes an angle of nearly 60°, thus producing a much more striking stereoscopic effect. As a double combination portrait lens it has a focal length of 3½ inches; whilst as a landscape combination it has a focal length of 6 inches. Mr. Dallmeyer has not adopted the orthographic form of lens, but in place of it he intends to introduce a triplet: the first one so constructed he gave me an opportunity of examining. This, as its name implies, consists of *three* achromatic combinations, with cemented contact surfaces, the total number of reflecting surfaces being thereby the same as in a portrait combination. The front and back combinations are both *positive*, and between these, in the position of the stop, is a *negative* combination. The ratio of diameters of front and back combinations is as 2 : 3, and the diameter of the negative combination is ⅔ that of the front: the ratio of aperture and focal length is as 1 : 15, which may be increased at pleasure by means of suitable diaphragms. The angle of picture included is about 56°. This lens, with a focal length of 17 inches, covered a plate 15 by 12 inches, with the lines straight up to the corners.

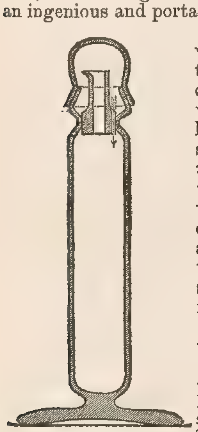
This triplet, as I said, is intended to replace the orthographic form of lens, and is therefore properly to be employed for architectural views and copying; but as each of the three combinations are actinic *per se*, the middle lens may be removed without interfering with the actinic adjustment of the two other combinations, and may in this way be employed for portraiture. Although with a comparatively smaller aperture it works nearly as fast as the same maker's portrait lens, on account of a reduction by two in the number of reflecting surfaces, it does not present so flat a field.

Mr. Dallmeyer's new lens has little in common with Mr. Sutton's "symmetrical triplet," the negative arrangement not being a single uncorrected lens, but an achromatic combination of such form and focal power, as is subservient to the corrections of the eccentrical pencil and the production of a flat field, with an aperture quite as large as can be used with the orthographic form of lens. The great drawback to Mr. Sutton's triplet is the very small aperture he employs in obtaining the necessary corrections.

Having heard of the neatness, compactness, and economy of the metal-plate boxes manufactured by Mr. Miers, I called at his workshop, at 15, Lamb's Conduit Passage, Red Lion Square; but although he does not pretend to make any show, as he chiefly lays himself out to supply the wholesale trade, he gave me an opportunity of inspecting his various patterns for small and large plates. These boxes are made in bronzed zinc, grooved in such a way that the plates lie so close together that 100 only take the space that 50 would occupy in a wooden one, and are hinged in such a manner that, whilst they are perfectly impervious to light when shut, it is impossible for the lid to open by accident or unpremeditatedly. As the metal has no disposition to harbour damp or give off terebinthinous exhalations, these boxes are in everyway preferable to wooden ones for storing dry plates or negatives, especially now that they may be obtained of Mr. Miers at about the same cost. I do not think that there can be a question but that metal will entirely supersede wooden plate boxes ere long. I have purchased some of these boxes for stereoscopic dry plates, to hold one and two dozen each; also another to store two dozen glasses half-plate size.

The next on my visiting list was Mr. Thomas Ross, of Featherstone Buildings. As he constructs photographic lenses after the principles laid down by his much-esteemed father, that veteran optician, Andrew Ross, whose view-lenses, I take it, no one can beat, I found nothing to call your attention to in the shape of optical novelties; but I may mention that he has introduced a neat method of uncapping a pair of twin lenses simultaneously, when they are fitted to be adjusted at varying distances. The two lenses are so mounted that they can slide nearer to or farther

from each other, according to the will of the operator, in a horizontal groove in the front of the camera. The apertures of the lens tubes are closed by means of brass plates working on pivots, as in French lenses: to the bottom of each plate a small binding-screw is hinged, through both of which a small steel rod passes, thus connecting the two shutter plates, as they may be called, and the rod is clamped at whatever distance the lenses may be apart. By pulling one end of this rod of course both shutters are drawn aside at the same moment, and by a contrary motion they are both simultaneously shut, their exact position over the apertures being secured by means of stop-pins. It is curious to notice how most of the camera makers are at one and the same moment giving their attention to the perfection of the bellows principle, and securing stability at the points of weakness. Mr. Ross has just perfected a form of camera which I will endeavour to make clear to you. The base-board is framed, so as to allow of a telescopic extension, by means of an endless screw. To this is clamped the two mahogany frames that carry the lens and plate-holders respectively, the middle portion of the body being made collapsable. The peculiarity, however, of the camera consists in the arrangement for securing a swing back motion, with economy of space and workmanship, which is thus effected:—The back, into which the plate-holder slides, is not more bulky than a common camera; the bottom is attached to a wedged-shaped piece of wood that fits into a wedged-shaped cradle (X), in such a way that when a rod with a clamp-screw is passed through an axial aperture, common to both pieces, it forms a powerful hinge the width of the camera. By this contrivance *the top* of the plate can be advanced towards or withdrawn from the lens. "The cradle" is attached to the base-board by means of a pivot passing through its centre, and thus another motion at right angles to the first is obtained, so that the plate can be adjusted to the exact focus of an orthographic lens: these motions, of course, are facilitated by the bellows construction of the middle portion of the body. Rigidity is given to the entire arrangement by means of two telescopic rods, placed one on each side of the camera, having at each of their extremities pins, to which freedom of motion is given by a ball and socket attachment. The two pins of each rod are pushed into sockets inserted in the front and back frames of the camera, the inner and outer tubes of the telescopic rods are pushed as far apart as possible, and then clamped by means of screw heads, thus rendering the upper points of support perfectly tort. The camera that I examined was for plates 10 by 8: the dimensions of this were 12 inches high, 13½ inches wide, and 6½ inches thick when the back and front frames were brought together. The telescopic sliding motion of the base board allowed of a range of focus of from 6 to 18½ inches. The orthographic lens, focussing lens, tripod head, and all the screws and fittings, pack into a box that fits into the belly of the camera—all, but the legs, pack into a leather case, and the weight then does not exceed 15½ lbs. This is certainly an ingenious and portable form of camera for plates of large size.



As I was near to Bourne and Taylor's glass warehouse, in Castle Street, Holborn, I called to examine a new form of collodion pourer, christened "THE COMETLESS:" as a sketch will assist your comprehension of its form I give one. The inner part of the neck is stoppered with a lipped tube through which the collodion passes on to the plate. You will perceive, from the construction, that this is the only point on which the collodion can dry, an accident that can hardly occur, as it is kept in a solvent atmosphere of ether when the bottle is capped, and if any film should form on this lip the tube is readily removed, so that it may be cleansed. Air is admitted to the body of the bottle to allow the collodion to flow, by means of a groove, ground in the stopper part of the tube at the point indicated by the arrow. I should fully expect this to answer the purpose for which it is intended.

At this point I turned hotelwards, but on my way I looked in at Mr. Ladd's, the optician's, in Chancery Lane, who, however, is more known to microscopists than to photographers; but, as I expected, I found a goodly collection of micro-photographs of the best execution. If you require *a cheap* form of microscope for viewing such objects I do not think you could procure a better one for the purpose than that he supplies at fifteen shillings. Of course, if you wish to indulge in a more expensive instrument he will be happy to meet your views; and one model, got up for students after the suggestions of Mr. Brooke and Professor Busk, vastly took my fancy as a practical instrument. I am off again to-morrow in prosecution of my exploring expedition.

So believe me,

Yours, "Eastward ho!"

SIMEON HEADSMAN.

Foreign Correspondence.

Paris, August 27, 1860.

I HAVE lived enough in England to know the unfavourable opinion which is there generally professed for honorary distinctions in the form of stars and ribands. You are disposed to look upon them as toys, fit only for satisfying the vanity of trivial minds. Though, from a certain point of view, you are not, perhaps, altogether wrong, yet it is not less true that, in our country, where the thing is looked at in quite another manner, such rewards are powerful incentives to emulation; indeed, we are indebted to them for many an act of heroism, for many important labours in science, in art, in literature, in industry, for many great and useful discoveries,—all which things are nowise hurtful to the glory of the country. They serve also to measure the importance assumed by any given science, art, or industry. From such twofold point of view the honours of this kind accorded to photographers have a welcome meaning for all those in this country who interest themselves in the new art. For several years past no list of nominations has appeared in the *Moniteur* on New-year's day or the Emperor's *fête* without containing the name of a photographer. First, there was M. Nièpce de Saint Victor, whose labours you well know; Blanquart Evrard, the author of the earliest manuals and the first photographic printer; then Maxime du Camp, an amateur, already knighted as a literary man, who was named officer for his Egyptian and Syrian views; then Salzmann, author of a collection of views from Palestine; Martens, one of the first who practised the albumen method, and whose pictures still bear comparison with the most perfect productions af the present day; M. E. Delessert, a distinguished writer and able photographer; Braun, the photographer of flowers; finally, on the 15th August last, Baldus, who reproduced the new Louvre, during its construction, piece by piece, and stone by stone. Besides this immense and successful labour, the most important that photography has been officially called upon to execute, Baldus is the author of a considerable number of works, remarkable alike for their beauty of execution, the artistic feeling which marks them, and for their colossal dimensions. You will, doubtless, be surprised at not finding in the list certain names which should hold the first places: the name of Claudet, for instance, who, since the origin of our art, has so perseveringly contributed to its progress, whose studies have been so useful, and who has obtained so many triumphs; that of Ferrier, the first who spread a taste for the stereoscope in France, with his beautiful views on glass, hitherto unexcelled, and who thus created one of the most fruitful applications of photography. We deeply regret such delay in the accomplishment of an act of simple justice; but we are confident that reparation will not be long retarded.

If I have dwelt at some length upon these facts, it is because with us they are important. The same distinctions being bestowed upon photographers as upon men of science, literary men, and artists, it is evident that photography is not considered as a series of mechanical operations requiring but the bare dose of intelligence necessary for seconding the instruments and the chemical reactions; and that is a noteworthy conquest, for it was not always so.

You will, I trust, allow me to say a few words with respect to a letter in your last number, signed "P. Warbeck," and headed "A Photographic Miracle!" seeing that it indirectly touches myself; for, both in the *Moniteur* and the *Lumière*, as well as in your Journal, I have spoken with praise of Woodward's apparatus, of Bertsch's automatic camera, and of the photographic ink. If your correspondent is a serious man, I may perhaps tranquillise him by the assurance that his outlay is not useless, and for this reason:—he will always be free to operate with the old processes and the old instruments; but that will not prevent him from procuring, if he thinks fit, photographic ink and Bertsch's camera, which will certainly render him great services. I am not aware that it has ever been asserted that, with this new apparatus and new bath, a mere

tyro can, without preliminary study, become a clever photographer. That would be absurd; and those who would say so would lower photography to the level of mechanical operations, in which the instrument would be everything and the intelligence nothing. It *has* been asserted, and truly asserted, that a man of taste — an artist — might, by studying the length of exposure, obtain good pictures upon glasses prepared beforehand, and developed on his return. It is clear, however, that it is then the preparer who must be clever; and if your correspondent has such an one, and is himself possessed of artistic feeling, nothing hinders him from employing Bertsch's automatic camera with advantage. As to the photographic ink and Woodward's solar camera, I can assure him that they have given results which will not be readily disparaged by those who, like myself, have had them before their eyes. If "P. Warbeck" meant to joke, he will allow me to remark, that he criticises at least two things that he is not yet acquainted with, for neither the photographic ink nor Bertsch's apparatus have hitherto been tried in England. When we speak of an art and a science still so near their origin, and which have yet so many improvements to realise, we ought not, I think, to be in a hurry to criticise new things, especially when we have not maturely examined them. It is in such cases that the most entire impartiality is indispensable. Your correspondent will, I trust, pardon these frank observations coming from the veteran of photographic journalism, who has seen the birth of many new processes which, though often lightly esteemed at the first, have brought fortune and a name to those who adopted them. I will merely cite, as an example, the albumenised collodion method, the original description of which my dear and much-regretted friend, Taupenot, wrote one evening at my house, while he told me, with discouragement, of the miserable reception it had met with from those to whom he had spoken of it. At present some of those very persons employ no process but this, which has helped them to attain results both beautiful and profitable.

Some additional communications have lately been made on the subject of the photographic observations of the eclipse of the 18th of July. Father Secchi, director of the Observatory of the Roman College, has reported the results of the observations he made in Spain, with the co-operation of an amateur, M. Monserat. Besides the numerous images of the whole sun, fourteen enlarged pictures of the phases were made, and five pictures of the natural size of the focal image of twenty-three millimetres, representing all the phases of the phenomenon. The exposure was very variable — from three to thirty seconds. All the images are over-exposed in the protuberances, but the corona has an intensity which differs according to the time. The force of the light from the protuberances is such that one picture is triple from the glass having received a jerk. MM. Maxwell Lyte and Michelier have also forwarded to the Academy a series of images of the eclipse, obtained by them on the southern side of the Pic du Midi, in the Pyrenees. ERNEST LACAN.

New York, August 7, 1860.

The American temper towards photography is peculiar. People here do everything as a business—I mean everything which exacts labour of mind or body. We have pleasures enough, but they are only the extemporaneous *dolce far niente* of concerts and theatres, or the occasional uproarious frolic of an excursion, pic-nic, or political *barbecue*. No one amuses himself deliberately — no one makes a system of amusement, putting his whole mind to it, and pursuing it to a distant end. Amateur artists or artisans are not to be found; we think of Louis XVI., spending his leisure in his smithy, as a fool.

The reason of this state of things is chargeable perhaps on our democracy, or general equality of condition. Labour for money is a habit and necessity for all. If wealth is accumulated in a family, it is only by a constant persistence of industry, which gives no opportunity for the cultivation of habits of study, or practice of the arts of solid refinement and pleasure. The wealth of a family is dissipated by its next generation. In Europe you have families which for centuries, by law, have been free from the ordinary cares of living, and inherit the habits of study and refinement of a long line of ancestry: out of such come spontaneously amateurs of the arts, who diffuse among their less-favoured neighbours their own tastes and habits. Your government—also patrons of science—and your many royal societies and academies all tend to give a dignity and popularity to the pursuit of knowledge for its own sake which our American masses know nothing of. The common measure here of all kinds of worth is the dollar.

Our American condition of things, however, has its advantages. The average advancement of knowledge and comfort is here higher than in any other country. The American mind is quick to apprehend and the hand to execute. In all manner of work whereon the prize is in our estimation worth the winning, we shall beat you. Show an American when there is a reasonable prospect of business, and he needs no advice to embrace it. We have not originated here any of the photographic arts, but we have done much towards putting them in a useful shape; very many of the little details which are elements of success in practice are due to us.

Photography was first made a business in New York, and they were New Yorkers who inaugurated the business in London. We have no Daguerre, Talbot, Archer, or Hardwich here, but we have the men who can put their ideas into action. There is no great demand here yet for philosophers, but when it comes it will be supplied.

So far prefatory; and it hath a tone somewhat apologetic, perhaps boastful. But it is a fair expression of American sentiment on such subjects; and I suppose you want the picture of photography in America to be wholly and genuinely an American production.

Now in future I propose to tell you just what happens here, what we are doing, and how we do it.

I have several matters of photographic interest at present, but prefer to defer them, in order that the practical facts may appear without any of the doubts or prejudices which may be incident to this letter. CHARLES A. SEELEY.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

SOLAR PHOTOGRAPHY.

T the Editor.

Sir,—In your last number your Paris correspondent gives a notice of what has been done by French *savans* in relation to the late eclipse. Among others, he speaks of M. Vernier's photographs, who, he states, "has sent me three, which, although of small size, give a very exact image of the sun at three different periods of the eclipse. *They are all surrounded by a halo*, the cause of which M. Verrier [*query* Vernier?] seeks in the phenomenon itself, and which, according to the adepts in photography, is to be explained by the simple fact that the operator made use of an objective with too large an opening."

Your correspondent does not state how large the aperture was; but in all my experiments in solar photography I have invariably found the halo alluded to, although I have reduced the aperture to one-sixteenth of an inch.

Mr. De la Rue alludes to some appearances in the photographic plate which were not observed through the telescope, showing that photography will register phenomena too delicate for the eye to detect.

The result of my own experiments, together with those of others, confirmed by your correspondent's notice of M. Vernier's photographs, induce me to believe that the halo or corona is always present around the sun, but the dazzling brightness of the orb itself destroys the power of the eye to discern it, while the introduction of coloured glasses obscures and renders it invisible.

During a total or annular eclipse, however, it becomes apparent in consequence of a dark body being interposed of a size sufficient to stop all, or nearly all, the direct rays.—I am, yours, &c.,

London, 17th Aug., 1860. W. HISLOP.

[Of the several specimens that we have had an opportunity of inspecting (not those of Mr. Hislop), all that show a halo appear to us to have acquired that appendage from errors in mounting the lenses employed. In all instances the "halo" is more or less detached from the body of the sun itself, and if it were a true envelope to that body we do not well perceive how that effect could arise.—Ed.]

TONING.

To the Editor.

Sir,—Hitherto my positive printing (which, however, has been only in rather a small way) has been all toned with the old bath of hypo.,—silver and chloride of gold mixed. That seems now to be no longer trusted for permanency, though in my hands it gave a good colour with very little trouble, and I see no appearance of change. Has not bad washing had something to do with its bad repute? Relying on your kind help (for no one can look at the last page of the Journal and doubt either your willingness or ability to assist) I have ventured to ask what advantage Maxwell Lyte's process has over some which seem less troublesome—Bayard's, for instance (No. 85, p. 11)? and if you practically know anything of Legray's and Jobard's (No. 91, p. 85)? Mr.

Leake (No. 105, p. 270) thinks the bath of hypo. and gold best, but without any silver, and even gets rid of the free nitrate. A friend recommends the carbonate of soda and gold, and the sulphur bath for Eusebius is something altogether different: between them all I am fairly puzzled.

If Maxwell Lyte's is on the whole most effective, please be good enough to say if the solution of *phosphate* of soda and the gold will keep, as I see the *carbonate* of soda and gold should be mixed a quarter of an hour only before using. May I also trouble you further as to what one grain of gold will tone? I think I have seen stated that it will tone one full sheet, $22 \times 18 = 416$ square inches, but then there seems great diversity of opinion.

In the *Liverpool and Manchester Photographic Journal*, No. 16, p. 204, James Alexander Forrest says:—"Make a solution of gold, three grains to one ounce of water, and three grains carbonate of soda; mix half a *drachm* of each, which is sufficient for a dozen proofs 9×7." Should it not be half an *ounce?* And Mr. Leake (No. 105, p. 270) says, a grain will only tone two proofs 10×8: that seems the two extremes. I suppose, as usual, the truth is somewhere midway with you and Mr. Hardwich, though on reference I find he only makes it tone from 240 to 250 square inches. I should feel very greatly obliged if you would set my mind at rest on these matters.

For the many hints and great pleasure I have derived from your Journal,—I am, yours, &c., FIX.

[We always try to aid our correspondents, and if we are at a loss we candidly say so. If all would refer to "chapter and verse" as you do, we should have much labour spared us. Bayard's toning bath is essentially one of *sel d'or* (double hyposulphite of gold and soda), with an alkaline chloride added: it therefore tones by depositing gold, it is true, but the gold is deposited by *sulphuretting the silver;* hence we do not think it so good as Maxwell Lyte's, which acts rather by *substitution* of one metal for the other. Jobard's and Legray's methods are both apt to degrade and even to destroy the half tones without the greatest possible care; and, as to trouble, they both require much more than Maxwell Lyte's. Every one has a right to his opinion, but we know that the hypo. and gold bath is *faulty in principle,* and therefore to be avoided. The soda and gold is good, and acts in precisely the same way as Lyte's bath; but it has the inconvenience, if too strong, of dissolving out the size from the paper.

The solutions of phosphate of soda and chloride of gold should be kept in *separate* solutions, and mixed just before use, adding a sufficiency of water to increase the bulk. Mr. Forrest manipulated in a peculiar way, —not in a bath; hence his solutions are strong. The quantity given is correct. One grain of chloride of gold, if properly used, will tone a sheet 22×18 inches.—ED.]

DRY PROCESSES.—DARK TENT.

To the EDITOR.

SIR,—A good modification of the collodio-albumen process will, I am sure, be gratefully adopted by many lovers of dry processes, and you will confer no small boon upon them in furnishing it. But meanwhile I do not think any one need "reserve his pledges," seeing that such worthy and tried confederates are in the field. The collodio-albumen process, as used by Messrs. Sidebotham, Mudd, &c., is surely neither tedious or uncertain if rightly practised. I have tried nearly every preservative process that has been suggested, and have obtained fair results from nearly all,—even from linseed, quince-pips, raspberry syrup and vinegar. But I prefer the collodio-albumen to all others, for the easiness with which it is manipulated, its sensitiveness, and the certainty of its results. I use the formulæ of Mr. Sidebotham or Mr. Mudd, and proceed thus:—After sensitising, remove to a vertical bath of distilled or rain water while coating the next plate, then wash under a tap or from a jug; albumenise and stand up to dry. After preparing, say a dozen plates (all this I do by subdued daylight), I dry thoroughly before a fire or over a spirit lamp, then stow away in mahogany boxes. As short a time as convenient before exposure I warm the plates again, sensitise in aceto-nitrate bath, and wash, till greasiness disappears, with common water. I never see a blister or stain, or fail to get my picture, when I have strictly followed this course, and am not clumsy or careless in the development.

I set out lately from London provided with a good supply of Fothergill plates, prepared strictly as Mr. Ackland prescribes, gum plates (Mr. Hardwich's formula), and Taupenot. I have had good success with all, but the best with the last; and in a series of comparative experiments I found it the most sensitive. I inclose you a specimen of each, printed under great disadvantages, and toned with bad materials procured in the country.

Mr. Ackland's and Mr. Hardwich's processes are both very good (the former the more sensitive, and having greater keeping qualities), but they require a peculiar collodion, and it is easier to spoil the plates, while there is scarcely an appreciable difference of time between the preparation of either kind and the Taupenot (except in the heating of the latter to prevent blisters). Let, then, the old favourite have our votes. If he can better adapt himself to our impatience and other infirmities, doubtless we shall not be sorry; but in any case let him not be deserted, for there is not his equal.

When next "Simeon Headsman" travels from east to west, let him stop in the Strand, and ask Mr. Rouch to show him the small "dark chambers" which he supplies for stereoscopic plates (and which will do well for whole plates). It is really a portable box, holds everything you want on the field save two tripod stands, and opens into a most comfortable chamber, with luxurious room and abundance of rigid surface. I have inspected every tent that has been advertised, and can confidently recommend this one as in all respects the best.—I am, yours, &c.

A CLERICAL AMATEUR.

P.S.—I should have stated, in favour of Mr. Hardwich's process, that it gives very intense skies, and develops nearly as rapidly as wet collodion.

[The specimens enclosed show that our correspondent is a skilful and careful manipulator. The two from the plates prepared with gum are very delicate and pleasing, more so, in our opinion, than those from the two Taupenot plates, though we have no fault to find with that in which the operator is himself included. All of the samples are good, however, and much depends upon the special requirements of each operator as to convenience of working before one can decide which process should be recommended. We think, however, that our correspondent can hardly fail to admit that Mr. Petschler's discovery, published in our last, really is an improvement upon all the processes, and the principle would probably hold good with many of them. We like to follow the advice of St. Paul:—"Prove all things: hold fast that which is good."

We have no doubt that the indefatigable "Simeon Headsman" has visited the establishment mentioned, and that we shall hear something about the favourite box that is a tent, or tent that is a box, ere long.—ED.]

DIRECT POSITIVES.

To the EDITOR.

SIR,—I have for some considerable time back taken great pleasure in what I wonder much is not more practised by amateurs, viz., taking views of scenery as direct positives on glass. In colour (having the tone of a lead-pencil drawing) and in sharpness of definition, in consequence of the very much finer texture of a good collodion, they exceed anything that can be done on paper, bearing an examination with a powerful magnifying glass—when, indeed, the effect is quite stereoscopic.

Of course they cost much less in *time, trouble,* and *money* than prints from negatives would, and to me at least, and I am sure to many amateurs, these are most important considerations. Besides, they are far more permanent than positives; and if more than one copy of each view is wanted, say to give away to friends, it is very easy to take as many *direct views* as may be required at once when taking the first.

Hitherto I have always worked with the wet process; but if I could learn a suitable and certain *dry process* for these direct positives, it would save a great deal of trouble, and often expense, in carrying dark tent and apparatus; and besides, if I had only to carry a light camera and stand, a box of dry plates and a yellow calico bag, I would get very many more pictures in the year.

Perhaps you would kindly suggest something that would suit my requirement. Any hints given in the next number of your Journal will be thankfully read by me, as I hope shortly to go from home, and have the opportunity of photographing some beautiful scenery in Ireland—for instance, a splendid panorama of mountains from a peak three thousand feet high, which I resolved to take the last time I was up there last year.

What developer do you recommend for instantaneous positives of children, animals, &c.?

With many thanks for the pleasure and advantage derived from the perusal of your Journal these last two years, I am, yours, &c.,

Harrogate, August 9*th*, 1860. A CURATE.

[We cannot agree with your notion that direct positives are superior, or even equal, to good paper proofs from negatives; and we would very much prefer a good negative to the best glass positive in the world: but *chacun à son goût.* We have already suggested a course of operation to you, as your letter reached us too late for insertion in our last; but as there are, as you say, possibly others who think with you, we repeat it more at length, and with your communication. We only offer a *suggestion,* not practical experience. We would try the plan of immersing the sensitised plate after removal from the nitrate of silver bath to one containing a solution of bromide of potassium, about one grain to the ounce of distilled water, and then, after washing slightly, allowing it to dry. We do not think any preservative solution advisable, as organic matter tends greatly to degrade the tones of a positive. We select a *bromide* to neutralise the free nitrate of silver, because it is, like the chloride, capable of being reduced by the action of light; and we have found that the union of iodide and bromide of silver is advantageous for positives, and that the two salts are more sensitive to the actinic influence than either alone especially when dry. We would use the proto-nitrate of iron (or a mixture of it with the proto-sulphate) as a developer, first, however, immersing the plate in a weak nitrate of silver bath. We do not think that there would be in this case any serious difficulty arising from the impermeability of the collodion film. We should clear with cyanide of potassium, to preserve the whites as pure as we could obtain them.—ED.]

OVER-ACTION OF DEVELOPER.

To the EDITOR.

SIR,—I have been sadly troubled of late with a sort of mistiness over my positive plates, never perceivable in ⅛ or ¼ plates, but almost always in ½ and ⅟. I find it the same with crown glass, colourless sheet, or patent plate. I sensitise in a bath of thirty grains; develop with iron; fix with cyanide; and after washing, the whole surface is covered with a something resembling a very thick coating of dust, which can be wiped off without disturbing the film. Can you kindly inform me, in your next Journal, whether the fault lies in the bath or the collodion, and how I can remedy it?—I am, yours, &c., MISTY.

[The action of your iron developer is too energetic, and acts upon the silver salt to some extent, even when *not* exposed to the light: this is possibly assisted by accumulation of ether and alcohol in the bath. The remedy for this inconvenience we think you will find simply by adding a few drops of a *weak tincture of iodine* to the collodion—enough to give it a pale sherry tint. Its action is to produce, in contact with the film, a very small quantity of nitric acid, which, we think, you will find more effective than adding the latter to your bath. A few grains of iodine in an ounce of alcohol will make your tincture; the quantity is not material, the colour produced in your collodion being your guide.—ED.]

FOCUSSING.

To the EDITOR.

SIR,—I do not find in any of our "A B C" books or Manuals of Photography any plain instructions for focussing a landscape, and shall be much obliged if you will kindly reply to the following queries:—

1. Supposing you wish to take a landscape, comprising foreground, distance, and middle distance, with an ordinary view lens and small stop, should you focus with the full aperture at first, inserting the stop afterwards?—and, if so, should you make any alteration after inserting the stop?
2. Should you focus for the foreground distance or middle distance?
3. Is there any practical objection to Mr. Sutton's plan of *marking* your lens to indicate a particular focus?—I am, yours, &c.,

A SUBSCRIBER.

[1. With all ordinary lenses the size of the aperture slightly changes the sharpest focal point, or in other words, the circle of least confusion is located at a somewhat different longitudinal distance from the lens; but if you get a sharp focus with a large aperture, and insert a smaller one, the sharpness will be further increased, though not to the utmost extent possible with the smaller stop. It is therefore better to focus with the aperture that you intend to employ for taking the picture, unless the illumination is too faint for you to see what you are about. Remember, also, that reducing the aperture very slightly lengthens the focus.

2. The point for sharpest focus must depend upon your subject. *The principal object* should be that selected; but if you have important objects in nearer or more distant planes, a compromise will possibly be requisite. If they differ very widely, a small aperture is the only remedy; but still the principal object should be that most sharply focussed.

3. No objection to marking your lens for the focus of a very distant object; but we perceive no utility in it, as we should never think of taking any view without specially focussing.—ED.]

☞ **The Publisher, in reply to continual inquires, begs to inform present or intending Subscribers to this JOURNAL that no difficulty exists to prevent its being received on the respective days of publication (viz., the 1st and 15th of each month) in any part of Great Britain and Ireland. It is printed in sufficient time to be despatched by the Publisher, Liverpool, or by the London Wholesale Agents, so as to reach the most distant Subscribers and Agents on the above days. Orders sent direct to the Publisher, accompanied by a remittance (if by post-office order, made payable to Henry Greenwood, 32, Castle Street, Liverpool), or to the London Wholesale Agents, Messrs. E. Marlborough and Co., 4, Ave Maria Lane, E.C., will receive immediate attention. Foreign Subscribers and Agents can also be supplied in the same manner by paying the additional postage charged by the Post Office. Orders given through Country Booksellers are carefully executed by Messrs. Marlborough and Co., as above, or by the Publisher, Liverpool.**

ANSWERS TO CORRESPONDENTS.

PRACTICAL INSTRUCTIONS ON COLOURING PHOTOGRAPHS.— *Those of our readers — and they are legion—who take an interest in Mr. Wall's valuable and interesting articles on Colouring Photographs, must bear with another disappointment and delay in the continuation of the series. An unavoidable accident, at the moment of going to press, has prevented the insertion in this number of the continuation of Chapter VII. It shall appear in our next.*

* * *—It is a cause of much regret when we find it impossible to reply to any of our correspondents in the number next published after receiving a communication; but we must remind those who delay their inquiries till the last moment, that we *publish* on the 1st and 15th, and that an interval of two to three days must necessarily elapse between publication and "going to press," which in our case is somewhat increased by Post-office arrangements. Those friends who wish for replies "in our next" must, therefore, continue to let their letters reach us *not later* than the first delivery on the mornings of the 12th and 28th respectively; and if any references are necessary, or elaborate replies required, at least one day earlier.

JUDICIOUS.—May be so. Try again. But we doubt if you will fare better.

ARGENTI NIT.—Johnson and Mathey, Hatton Garden, will supply you.

S. F. L.—We have not received any.

SAMSON.—We prefer good "*flatted crown*" glass for small plates.

AN INTENDING AMATEUR.—C. J. Hughes, Oxford Street; Murray and Heath, Piccadilly.

J. CROOK.—We have not seen the apparatus you mention.

T. WHARTON JONES.—Received with thanks. Notice in our next.

JULIUS.—The developer requires a little more acetic acid added to it, or it would not turn muddy so soon as you describe.

INVERNESS.—See Messrs. Petschler and Mann's paper in our last number. It describes the very thing you want; nothing can well be more perfect for a continental trip.

H. A. P.—We will not be led into the expression of an opinion with only half the case before us: we must have both sides of the question to enable us to judge.

HENRY J.—You will get it at Murray and Heath's, Piccadilly. We do not know if any other manufacturer produces one.

GREENHORN.—Get rid of it at any price; you are, however, rightly served, for you ought to have known better.

S. L. D.—We do not believe a word of it, and have no doubt that it is a gross and malicious libel. We think better things of English *ladies*.

WEAK.—Your collodion is not sufficiently iodised; add about two grains iodide of cadmium to each ounce.

PHOTO-FELIX.—You are an exception to the rule, then, for ill has been the fortune of most this year, as regards weather. Frith and Hayward, of Reigate, will undertake what you want, we have no doubt.

F. P. (South Wales.)—We are not quite sure about the initials. You had better apply to Mr. Mudd, of Manchester, or Dr. Norris, of Birmingham, for a supply. Do you never read the advertisements in this Journal?

OLIVER N.—Cyanide of potassium to remove the iodide, &c., of silver from direct positives, is almost an absolute necessity, as the resulting tones of the lights, after using hypo. instead for fixing, are very materially degraded.

F. W.—A pneumatic holder will remove all your troubles. Shew, also Hughes, in Oxford Street, or Murray and Heath, Piccadilly, will supply you, and all are close at hand to you.

MARGARET.—You will find that the india-rubber finger stalls (which cost about 3d. each) will protect the fingers when printing and toning, if you only use common care not to dip them too deeply into the solutions.

WOULD-BE OPERATOR.—We will gladly assist you, if you only give us the means; but when you ask "what camera we recommend?" how can we do so without knowing the purpose to which you wish to apply it, and the size of the pictures you desire to take?

ROBERT L. HUME.—A good glass bath is the best. We have a hard earthenware one in use that has stood well for three years: it was made for a cell for a galvanic battery, and cost six shillings.

R. GORDON.—Messrs. Forrest and Co., Lime Street, Liverpool, are the most likely people to procure what you want. Write direct to Mr. Forrest: he is an enthusiastic photographer, and will certainly respond to your communication.

F. M.—Your sensitising bath is most likely partially exhausted. Add to it about twenty grains more nitrate of silver to each ounce, and you will not find your paper assume the mottled appearance of which you complain.

DREADFUL MUFF.—It is said that "a fault admitted is half cured." Never mind the trouble; it is not half so bad as spoilt prints. We prefer Maxwell Lyte's, but the other is good.

F. M.—Waste collodion poured on and immediately rubbed with a piece of rag will remove the varnished film as rapidly as anything that we know. Placing the plates in hot water is a good plan, and rubbing with a cork.

F. B.—The fault lies in the nature of the collodion, which is too contractile, and when re-moistened, expands more than the albumen. The best chance for the rest will be to place the plates for ten minutes or so on a *hot* brick, prior to development, to coagulate the albumen thoroughly, and make it adhere firmly to the plate.

CHLORIDE OF SILVER.—Silver being five shillings per ounce, the chloride should be worth about three shillings and sixpence; but as there would be the labour of reducing it to take into account, we presume that about three shillings per ounce would be a fair valuation.

M. O.—A lady, of course. —Place your sitter near the window, but *not* in front of it, and a little shaded by the wall, say about a foot back from the edge of the window. Hang a table-cloth over a tall clothes-horse, on the side opposite to the window, to reflect some light on the shaded side of your sitter, and do not let it encroach on the "field of view" of your camera.

ENQUIRING OPERATOR.—If your collodion is not thickened from evaporation of the solvents (alcohol and ether), add to it about ten minims of chloroform to each ounce; the pyroxyline will be precipitated in the form of drops of transparent jelly, but will redissolve on being shaken, and the collodion, though still thick, will flow very readily. This kind is preferable for dry plates. If the thickening be from evaporation the remedy is obvious: add ether.

S. W. L.—1. We never met with the effects this correspondent describes, and can only advise the use of Newman's or Mansion's colours, or the varnish sold for alabastrine pictures, to which they very readily and firmly adhere, too firmly if you are not careful. —2. Water-colours are quite unfit for glass positives, and a thick coat of body colour on the background is sure to produce the effect described. This was shown in Mr. Wall's "instructions."

JOHNSON WOOD.—You must be a *very* new subscriber, as if you read our *last two* numbers carefully you will find most of your queries answered in reply to other correspondents. Before development it is only necessary just to wet the whole surface, in order to allow the developer to float readily. You have too little acetic acid in your developer; use at least twice the quantity named. No wonder it turns muddy soon, your exposure is too long; try half the time. For preparation of plates, see our last.

H. COOKSEY.—There is no good method of converting positives into negatives. The two most promising are, producing a deposit by bichloride of mercury, and then blackening by ammonia (as introduced by Archer); and next, the conversion of the silver into an iodide, by a weak solution of iodine (a few drops of the tincture added to some water), washing, covering with nitrate of silver, expose to light, and then redevelop. Another course has been recommended, but we fear with but poor results, namely, whiten with the bichloride of mercury, wash, and turn the deposit *yellow* by iodide of potassium.

C. F. D.—1. The specimen is not good enough to enable a fair judgment of the lens to be arrived at.—2. The negative is very much under-exposed; it would have borne at least double the time you gave with the materials used. We notice crapy lines in the collodion, the slate roof is a mere white patch, and the foliage dabs of black, with white-washed paths in the garden—all indicative of under-exposure and over-development.—3. Fothergill's process is excellent for printing transparencies. The time of exposure to gas-light must depend upon distance from the light, density of the negative, and sensitiveness of plate. It would be impossible for us to guide you with certainty until you are more skilled than you yet appear to be.—4. We have given all that has been published with regard to Mr. Petschler's process, but you may safely use half albumen and half water.

BYNX. — 1. We have already given all that is published respecting Mr. Petschler's method of working the collodio-albumen process, but to any one who is familiar with the Fothergill process the details ought not to present any difficulty. The processes are precisely the same up to the coating with albumen, the only difference being that in Petschler's the latter contains about two grains of chloride of ammonium to each ounce of fluid, and we have reason to think that equal parts of albumen and water are sufficient for the purpose. After coating with albumen the plates are to be drained and *thoroughly* dried by aid of heat. Before exposure they are to be rendered sensitive by *copious washing with ordinary water*, and again dried—this time, of course, in the dark. Develop as in Fothergill's process. 2. We know of no work equal to Hardwich's *Manual*; but the best toning formulæ have all appeared repeatedly in this Journal. 3. The fault lies with your bookseller; if you send a subscription by post-office order to HENRY GREENWOOD, *Publisher*, 32, *Castle Street, Liverpool*, you can have it delivered by post on the days of publication, and sending it abroad is merely a question of postage. Write to the publisher.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 126, Vol. VII.—SEPTEMBER 15, 1860.

Our worthy friend, the editor of the official organ of the Photographic Society, has, in the last number of that publication, directed attention to the subject of the sale of photographic copies of works of art by the authorities of the Department of Science and Art at the South Kensington Museum, at the same time recording a strong protest against what is regarded as an unfair interference with private enterprise in reference to the commercial aspect of the question.

We have no great affection for South Kensington and its *Department of Science and Art*, which we consider to have been established and maintained upon the most barefaced of false pretences—that of offering facilities for popular instruction in Science and Art—while it is located in such a position that the majority of *the people*, for whom it is ostensibly designed, cannot approach it without the expenditure of money (and time, which is money's-worth) that they can very ill afford. Moreover, in making South Kensington the head-quarters for preserving the Turner and Vernon collections of pictures a direct breach of faith is committed with the Nation, which has decided, through its representatives in parliament, that its national collections shall *not* be carried there. But, who knows? perhaps this is merely a temporary arrangement *for the convenience of photographing each picture.*

When the Photographic Society and its annual collection were "taken in" there, we strenuously opposed the proceeding, and predicted what actually occurred — that *the people* would not go to see it. They did not; and although the Society was charged no rent it was out of pocket, and the affair proved a dead failure.

Having no love for the "Department" we are not over-inclined to argue in its defence in the smallest degree; but, nevertheless, we must "break a lance" with our worthy friend in consequence of a few passages which we find in the article to which we have adverted, *e.g.*:—

"We have examined Mr. Scott's evidence, in which he stated that the operations of the Department in Science and Art had had the effect of *entirely destroying photography in its higher branches as a profession.*" Again:—

"*He had* been authorised by Mr. Roger Fenton, &c., to say that since, &c., he *had given up* all the higher branches *of photography.*"

Poor Fenton! To think that he should come down to be but a second-rate photographer! by his own admission, too! We must have one more extract, but this time from our friend's article—*not* from the abstract of evidence; and here it is:—

"We need not point out to our readers that with such an oppression as that it is impossible for *the higher branches* of photography to thrive; and if this system be permitted *the knell of photography is sounded.*"

It is perfectly evident from the context that the phrase, "*the higher branches*" of photography, as here used, is intended to apply to the *mere copying* of paintings, *et hoc genus omne;* and this appears in the official organ of the Photographic Society in its most official manner! If we are not egregiously mistaken, we apprehend that there are but very few of our readers, or of those of the Society's Journal, who will concur in this view of the case. That the copying of works of art may be, and undoubtedly is, a very useful application of photography, we are ready to admit; but that it has the smallest claim to rank as one of the higher branches we most strenuously deny. And whatever may be the claim of certain professional gentlemen who gain a livelihood by copying paintings, &c., photographically, to have their cause against the Department of Science and Art advocated, we have not the slightest fear that, even if the whole copying practice were utterly annihilated, the *knell of photography* would have been sounded, or that the scientific and art portion would suffer in any material degree. Our good brother editor has allowed his kindness of disposition to blind his judgment; and in his enthusiastic attempts to advocate the cause of his injured friends he has fallen into the common error of trying to prove too much, and has thus got himself into a scrape. Only fancy reproduction being classed as one of the higher branches of photography! Printing, then, we presume, belongs to the *higher branches* of authorship. We will conclude by the old saying, "save us from our friends!"

The recent experiments of Messrs. Petschler and Mann, relative to the preparation of collodio-albumen plates, appear to have excited considerable interest amongst our amateur brethren of the camera, if we may judge from the numerous remarks made in reference thereto by our correspondents. This is, of course, no more than we anticipated would be the case, from the practical value of the discovery which these gentlemen have made and published; and, as everything in connexion with it is worthy of consideration, we beg the attention of our readers to a communication, which will be found in another column, from Dr. Hill Norris, of Birmingham, which bears upon the subject. We are, however, scarcely prepared to accept the theory advanced, that the impression effected by the agency of light is merely (in all cases) an "electrical" one, as there are many facts which appear to be totally opposed to a corroboration of this view.

That the action of an alkaline chloride in removing the actinic impression is very energetic we readily admit; but we perceive no greater discrepancy in the assumption of a removal of the latent impression (even though it be the result of decomposition), by means of the subsequent decomposition of the chloride, than by supposing it to be due to the release from an electrical condition of the film. That an electrical action may, and most probably does, accompany the actinic impression we see no reason to doubt; on the contrary, there is every reason to anticipate its existence. But is not this rather the effect than the cause of the action? It is highly probable, also, that the electrical force may have much to do with the development of the image, and this especially in the daguerreotype plate. We

cannot but think, however, that there is more than this in all cases where any modification of the Taupenôt process is employed, in which the albumen plays so very important a part. Moreover, the layer of iodide of silver may be entirely removed from a collodio-albumen plate, subsequently to its exposure in the camera, and prior to development of the picture, as demonstrated by Mr. Young, of Manchester. Surely, the action of the hyposulphite of soda, and the subsequent copious washing in water, would be sufficient to remove any trace of a purely *electrical* image. We are, therefore, inclined to conclude that a perfectly satisfactory solution of the principle involved has yet to be discovered.

Before concluding our remarks upon this point, we may as well record the fact, that plates prepared with collodion and albumen—the latter containing a decided excess of citrate of soda—are sensitive to the actinic action. Of this there is no doubt, as the following facts will demonstrate:—Being about to take a short holiday we hastily prepared a dozen dry plates, by the Fothergill process, as indicated in a recent number of this Journal, employing dilute albumen for the purpose, containing two grains of citrate of soda in each ounce of the dilute solution. Being several times interrupted during the preparation of these plates, we put down two of them to drain, after their having been coated with the dilute albumen solution; and, having been called away at the time, we accidently placed them to dry on returning to them, without having previously washed off the superfluous albumen, as ought to have been done. This fact we remembered the next morning, when proceeding to store away the plates in a tin box; but, not having placed them in any regular order in the drying rack, we were unable to discover which two had been treated as described.

As there was no help for the omission, we simply made up our mind to find two out of our stock of plates turn out failures; but the provoking part of the business was, that we could not calculate upon *which* two they would be. After our return to town, we developed the several pictures, and the pair of culprits were unmistakeably discovered: an image was rapidly produced upon both of them, with sufficient detail to distinguish the exact localities of exposure, but as rapidly the whole plate in each case became enveloped in a dense fog, which, though utterly destroying the negatives for any practical purpose, by no means entirely obliterated the impression. As these were the only two plates, out of the dozen taken, that behaved in this manner, we have no reasonable doubt that they were any others than the two which we were aware of having imperfectly prepared. It is not improbable, therefore, that had we known which of them were in this condition before development, we might possibly have obtained upon them presentable pictures, by very copious washing, so as to remove the excess of citrate, prior to pouring on the developing solution, instead of merely moistening them, in order to allow the developer to flow without interruption; for it is an incontestible fact that the impression was there in spite of the excess of the alkaline citrate salt.

We have experienced both surprise and regret on finding that our Manchester friends have spoken of our notice of M. Petschler's recent discovery, connected with the collodio-albumen process, as being unfair, or, what amounts to the same thing, that we have not quite fairly put the matter of that gentleman's important discovery before the public. The particulars of the charge against us will be found in the "Report" of the last meeting of the Manchester Photographic Society, which we publish this day, and which are contained in the remarks of Mr. Mabley and Mr. Sidebotham. We should have felt really at a loss to have conjectured in what manner we could possibly have given offence but for Mr. Mabley's assertion that we had attempted to detract from M. Petschler's merit by insinuating that his discovery was only a variation of the Fothergill process. Such a notion on his part can only have arisen from entirely misunderstanding our observations. We had not the most remote idea of making any insinuation, or of detracting from merit that we were delighted to acknowledge; and this, we think, will be sufficiently manifest to any one who will turn to pages 231 and 248 of the current volume, and re-peruse what we have written on the subject. In the latter place cited we pointed out the analogy of *principle* involved in the preparation of collodio-albumenised plates by the formula of Messrs. Petschler and Mann, as compared with those by the modification of the Fothergill process, which we are in the habit of employing—this analogy being revealed by Mr. Petschler's discovery. We cannot perceive in what way this indication detracts from the merit of the *discoverer of the principle*. In our opinion it rather tends to its exaltation. At any rate, we can assure our Manchester friends that we hold Mr. Petschler's discovery in quite as high esteem, both as regards utility and novelty, as the most enthusiastic amongst them. We trust that there is no room for misunderstanding this assertion.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

If anything had been wanting to convince us that the mere copying of paintings, drawings, or engravings by photographic agency did *not* constitute "the highest branch of our art" (an error into which, we must admit, there was but small chance of our falling), it would certainly have been supplied in three little studies by our indefatigable friend, Rejlander, of Wolverhampton, which have recently come to hand. As our friend is an artist in the widest acceptation of the term, of course it will happen that even in such a "mechanical" art (according to those who fear its power) as that of photography, a bit of true feeling or humour, as the case may be, will peep out; and our perversity is so incorrigible that we will persist in estimating these productions at a higher rate as *photographs* than the very best copies of the finest pictures in existence, and that simply because we fancy there is more brain work employed in the photographic part of the composition. Be that as it may, the three specimens before us have each a thought included in its structure which fits it either to "point a moral or adorn a tale."

"Coming Events Cast their Shadows Before,"—though but a trifle in itself, besides exhibiting its touch of humour, is very artistically conceived and executed, with which, even regarding it merely as a portrait, the individual represented could not possibly fail to be perfectly satisfied. A young man, reclining in an easy chair, with his meerschaum in the left hand, is with the right caressing with complacency a very incipient *moustache*. The gratified expression, the general ease of the attitude, the harmonious combination of the lines of the accessories, viz., the chair, drapery, &c., combined with the admirably graduated and suggestive background and delicate half-tints of the shaded portions of the face and figure, call forth the emphatic expression of approbation in the spectator.

"Have a Tune, Miss?"—is enough to throw Mr. Babbage into a paroxysm of indignation, as it is difficult to avoid being convinced that one of his inveterate persecutors, an itinerant piano-grinder, is not in reality before him. In this, the manipulation of the photograph is particularly to be admired as well as the composition; for, not only is it brilliant, but it is entirely free from spottiness, and, what is very rarely noticeable in a brilliant picture, is destitute of any absolutely white parts,—being round, soft, and delicate throughout.

But, if these two elicit admiration, what shall we say of "The Disciple?"—Indeed, there is very little to be *said* about it; but we *think* the more. As a piece of fine statuary, it appeals direct to the imagination, insinuating an idea, that is, nevertheless, almost inexpressible in words. As we gaze, we do not heed whether it is a drawing, or sculpture, or a photograph, or what not, that we are looking at, and are intent only on comprehending all the meaning involved in the composition.

We had almost forgotten to intimate, that it is simply the classical-looking figure of a youth, in an attitude of wrapt attention, that forms the subject. Is it not St. John, the beloved disciple?

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 12.

In the July number of the Photographic Society's Journal appeared a letter from Mr. Maxwell Lyte, offering a formula to the collodion committee. Although it is our intention to differ from Mr. Lyte on this particular occasion, we do so in the best possible spirit; for we have often availed ourselves of information derived from his researches, and have admired his perseverance in continuing the pursuit of photography long after its novelty has ceased.

The proposal to employ *paper manufactured from linen* as a material for pyroxyline will doubtless meet with support from many, since there is an ease and comfort in working with linen, which prepossesses strongly in its favour, and the collodion has many very desirable properties, such as fluidity, adhesiveness, and a capability of remaining for a long time in a moist state. It was not, therefore, without reasons which appeared very cogent, that in offering a formula for a normal collodion we were induced to discard the fibre of linen, and to employ that of cotton in preference. Stability, previous to iodising, is a point of the first importance in a commercial collodion, liable at any time to be sent to the colonies or other distant parts; and, according to our experience, the most stable plain collodion cannot be made out of linen.

Let us examine the above statement, that linen is not suitable for making the most stable collodion! What are the grounds for such an assertion? First, we say that experience proves as much: the collodion decomposes more rapidly, both before and after iodising, than collodion from cotton. "But," Mr. Lyte will reply, "perhaps you did not properly adjust the temperature, or the proportions of the two acids, or the amount of water, all of which must be different when linen is used instead of cotton." We say, however, that even after allowing for the peculiarity of the fibre with which we had to deal, and *humouring* it, so to speak, in every possible way, we could not succeed in preparing the most stable description of collodion out of linen. Placing Mr. Lyte once more on his defence, we can imagine him to continue it as follows:—"Stability is not by any means lost sight of in the proposed formula. You will see that a portion of bromide is introduced, which adds to the keeping qualities, and the unstable iodide of ammonium is superseded by the iodide of sodium." We allow all this to be good, and in the right direction; but so much having been done, why not do more, and employ the most stable form of collodion, as well as the most stable iodiser? This is the point upon which we join issue with Mr. Lyte; and although he avoids all mention of the subject in his letter, we see that, for some reason or other not explained, he is indisposed to adopt the views which we lately brought forward on the subject of pyroxyline. Many still think that too much has been said about photographic pyroxyline; but we entirely differ from them, and believe, as we have often before affirmed, that it is the very keystone of the collodion process.

It may be asked, what can be given as a sufficient reason why the bleached fibre of flax should produce a pyroxyline of less stability than that derived from cotton? We reply, that although chemistry has not at present clearly defined the two forms of cellulose above alluded to, we are convinced that there are important differences between them. Whether it be in consequence of the bleaching processes through which the flax passes, we know not, but our experiments have always shown that linen is more readily affected both by acids and alkalies than cotton or calico. You may select linen and calico of precisely the same fineness of quality, and yet the former will dissolve in a nitrosulphuric acid mixture, in which the latter will not dissolve. The linen also appears more prone to pass into the state of *sugar*, and from thence to nitro-glucose, than the cotton fibre. When, therefore, we examine nitro-glucose and prove it to be an unstable substance, producing great intensity of collodion, we are not surprised to find that the collodion from linen partakes more or less of the same character.

But supposing we allow, for argument sake, that linen is a desirable substance to employ, would it not be better to use it *as linen* than to purchase a paper made out of linen rags. We have no security whatever that the manufacturer will use any one description of rags for his paper: they will be new or old, as he finds most convenient; and it has been shown that both cotton and linen undergo a change by continual use, which is detected on making the fibre into pyroxyline. Mr. Heisch has lately stated that Swedish paper may be depended upon, but we are quite sure that the contrary is the case. In speaking of the purity of Swedish paper, chemists probably refer to its use in the laboratory, and to its freedom from ash after burning. The photographer, however, cares nothing for the inorganic salts which produce the ash, because they are dissolved out by the nitro-sulphuric acid. It is of far more importance to him that the paper should always be made from the same description of cellulose, and this is not the case with the Swedish paper. At one time, when we were in the habit of preparing collodion largely from Swedish paper, we received a supply which proved to be entirely different from that which preceded it, although the characteristic water-mark was upon it. The old sample had produced pyroxyline which gave a fluid collodion with seven grains in the ounce of solvents, but this one admitted only of the solution of five grains, and even then the collodion proved rather ropy and non-adhesive. Without any doubt the objectionable sample (of which the importer had a stock of forty reams) contained *cotton* in its composition, and no chemist, however eminent, shall persuade us to the contrary. Nevertheless we admit that Swedish paper is more to be depended on than other paper in the market, and that in the majority of cases it will be found to produce the limpid quality of collodion.

With reference to the use of iodide of sodium as an iodiser, in place of iodide of potassium, we see but one objection to it, viz., the difficulty of obtaining iodide of sodium commercially in a pure state. Some time since we ordered half-a-pound of this iodide from a firm who have a reputation for pure chemicals, but it did not prove equal to the best iodide of potassium in sensitiveness. The difference was not great, and in bromo-iodised collodion almost inappreciable; but it became very evident when the collodion was iodised simply, without any admixture of bromide. The preparation of iodide of potassium is now brought to such perfection, in consequence of the great demand for it, that it would be difficult to supersede it by any other iodide, unless a marked advantage could be shown. The iodide of cadmium has, it is true, been successfully introduced into commerce, but then it must be allowed that the advantages which this iodide offers are very remarkable. No possible reason can be adduced why iodide of sodium should not be made of equal purity with iodide of potassium, if the operative chemists would take the matter up; but how are they to be persuaded to do so? In no other way than by an extensive and continual demand for iodide of sodium on the part of the consumer, and to ensure this demand it will be necessary to convince him of its superiority. Compared with iodide of potassium iodide of sodium is more soluble in strong alcohol, and hence less liable to crystallise in the collodion, whilst nitrate of soda, the product of its action on the bath, is far more soluble in water than nitrate of potash.

In summing up what we have to say of Mr. Lyte's formula, we should consider it as likely to satisfy the wants of the amateur who prepares his own collodion, in small quantities, as he requires. But as regards the commercial manufacturer who supplies *a simply iodised collodion free from bromide*, we advise him to use cotton, and not paper, for his pyroxyline; otherwise he will probably have to undergo an uncomfortable experience in the form of letters from dissatisfied purchasers, who, having laid in a stock of the plain collodion, find at the expiration of some months that it has greatly deteriorated in quality.

OBSERVATIONS ON ALBUMENISED PAPER AND ALKALINE GOLD TONING.

By C. Jabez Hughes.

No. I.

As the verdict of the photographic world may fairly be considered to be given in favour of albumenised paper as the best known material for printing upon, any investigation tending to improve its production may be considered of value, particularly as for some time past very many complaints have been made of its quality. The *odium photographicum*, deservedly attached to the old acid hypo. bath, seems likely to be transferred to this unfortunate material, for certainly so great an outcry has never been raised against it as at the present time. This is so eminently the case, that many practical photographers declare that at no former period was so much bad albumenised paper extant as during the present season. To this opinion I cannot subscribe. Whilst freely admitting that much, very much, of the paper in the market appears to be produced *only to sell*, and certainly merits all the condemnation it has received, yet there are other causes in operation this season to which may be attributed many of the printing vexations, besides the ignorance and carelessness of the preparers of albumenised paper. Foremost among these causes stands the altered method of toning that is getting into general use. I believe the great bulk of photo-

graphers are now convinced that toning and fixing by one operation in a gold and hypo. bath is as unsafe in practice as it is indefensible in theory. With this conviction some modification of the alkaline gold toning (I wish we had a better term) has been adopted, and speedily new difficulties have arisen, and which have hastily been attributed to faults in the albumenised paper. It is certain that many papers that work very satisfactorily with the old gold and hypo. bath give no end of trouble with the alkaline gold. The latter method, despite its great merits, certainly requires peculiar kinds of paper and more careful albumenising to ensure the highest order of prints. When it is remembered that the chemical reactions are different in the two toning processes, it cannot be surprising that the results should vary; and if these results, though much better in some respects, be more difficult in others, it is a duty to investigate these difficulties with a view to their removal.

In the foregoing remarks I have assumed that the main complaints have arisen from the troubles experienced in reducing to practice the superior method of toning, by using paper not adapted for the process. That there are other causes of complaint I have no doubt, and will allude to them in the course of these articles; and if I should be so fortunate as to elicit during the course of the discussion the experience of some other practical photographers who have paid attention to this subject, great good must result. The subject is one much needing investigation, and is at the present moment thrust upon us by the daily complaints we hear.

The term "bad albumenised paper" is so vague, and the causes of badness so various, it is difficult to know what is meant by it. It is much easier to know what constitutes good albumenised paper. Though there never was or will be any paper that will please everybody, yet certain qualities are universally acknowledged as being essential to well prepared albumenised paper. The paper itself must be free from holes and metal spots, and sufficiently strong to bear handling freely during washing. The surface must have a uniform glaze, without any marks of air-bubbles, irregular streaks, patches, or drainings in the layer of albumen. It must not have finger marks on it, or be creased. It must be albumenised on its right side, for all papers have a right and wrong side. The gloss must be perfect up to the edge and in the corners. During the process of hot-pressing, and afterwards when lying in the ream, no foreign substance must be allowed to get between the sheets, such as pins, bits of string, scraps of newspaper, &c. I have seen the impression of a pin sent through twenty sheets, and annoyingly present in the finished pictures.

Good albumenised paper, after it has been sensitised, should retain its whiteness in hot weather for twelve hours, and in cold weather for twenty-four hours or more, without discolouring. It should tone uniformly without showing any patches or streaky lines, that obstinately refuse to change colour. It should not have the appearance, after toning, of being freckled all over with little red spots; neither should it have a mealy, granular, grey look, especially in the deep shadows.

If the toning is properly conducted—and of this more hereafter—the paper should change to a rich colour in from two to five minutes in the alkaline gold, and from five minutes to a quarter of an hour in a gold and hypo. bath. When toned, fixed, washed, and dried, the *whites* should be really white, and have no yellow tinge; and the paper should retain sufficient of its sizing to prevent the adhesive material from penetrating to the face when the picture is mounted. Any paper possessing the above qualities may certainly be considered "good albumenised paper," and in the proportion that it varies from the above high standard it may so far be designated bad.

In order to properly examine these conditions of excellence, the subject must be divided into three parts, namely:—The Plain Paper—the Operation of Albumenising—and the Toning Process.

The plain paper.—When it is considered that the picture on an albumenised print is very superficial and mainly in the albumen, it might reasonably be supposed that the paper played a very unimportant part, serving little else than as a convenient substratum for supporting the albumen, just as the glass plate does the collodion film. However feasible this view may appear it certainly is not correct, for the nature of the paper is of the greatest consequence: the film of albumen serves to give an artificial hardness, and otherwise modifies the result, but the main character of the finished picture depends on the paper itself. Thus, if a paper is rough and coarse, the albumen will not conceal that roughness, but it will show itself through the glaze, no matter how highly it may be albumenised and hot-pressed. Some papers have a tendency to give red, others blueish or black-toned prints; and the layer of albumen, as well as the chloride it contains, will at best only modify, but never remove, the original tendencies of the paper. I do not say that a paper is bad because it has a rough surface: for certain subjects it is a great merit. Artists have a great craving for this sort of paper; but if one has a rough-surfaced paper it must not be expected that albumenising will make it a smooth-faced one, or that the roughness is indicative of any fault in the albumenising operation. Not only will the roughness or smoothness of surface, but also the raw material of which the paper is composed, the sizing, the bleaching agent, the thickness or thinness of the sheet, and even the molecular arrangement of the fibres, affect the nature of the photographic print. Though these modifying influences are well known to persons in the habit of preparing paper, yet the bulk of the photographic public who purchase paper ready to their hands are not aware of the extent to which their pictures are affected by these agencies. They think that albumenised paper is simply albumenised paper all the world over, and that the terms positive and negative, French and German, Rive and Saxe, are mere refinements about which they need not bother their heads; all they want is a highly-glazed paper, upon which they can print and tone without any trouble, and if they do not get this the fault lies with the person who undertakes to albumenise the paper. This idea I wish to dissipate. I desire to show that the resources of the albumeniser are limited. That the public must meet him half-way, and select those papers they find best adapted to the toning processes they wish to practise, and not take any paper indiscriminately. The interests of the albumeniser and the photographer are the same; and it is not to be supposed that the former will go on continuously producing paper that he knows is not suited to the wants of his customers. Vague and general complaints are not enough: the faults must be clearly defined, and without doubt they can be amended. As a rule, it is certain that photographers cannot prepare their own paper, neither can albumenisers try their papers upon the same wholesale scale that their customers do; therefore, unless there is a harmony between them, the paper will not be produced to suit the new order of things, and photographers will either be continually making complaints, or fall back on the old hypo. baths as the readiest means of extricating themselves from their troubles. Far be it from me to say one word against legitimate complaints, or to lift my pen in justification of streaks, dirt, air-bubbles, creases, or similar faults. These are obviously the result of carelessness or ignorance: yet photographers should be impressed with the fact that all papers have their distinctive peculiarities, which can never be avoided; that some are better suited for one process than another; and that a given sample, if free from the above defects, is not necessarily a "bad albumenised paper" because Mr. A. B. cannot get prints to his taste with it. It will be my endeavour to point out some of these peculiarities, and, where faults are acknowledged, to suggest remedies.

Nearly all makers have two varieties of paper, thick and thin. In calotype days these had names given them, which they have retained ever since. These photographic pioneers—for they may be spoken of almost as a race that has died out—found that the thin paper was finer in its texture and better adapted for negatives, hence they called it *Negative* paper; whilst upon the thicker kind the best prints were produced, so that was called *Positive*. The names are retained to this day, though both are now used for printing upon. Negative paper is not only thinner, but generally finer in its substance. It seems to have a closer grained surface, and is well adapted for prints where great sharpness and detail is required. This paper has therefore been in great use for stereoscopic work. But it requires careful handling in the washing, for it is very tender, or it will break with its own weight when in the water. The thicker kind, or positive, though the surface is not so fine, has other counterbalancing advantages: it gives more vigorous prints, and is altogether better adapted for larger subjects, not only by the greater boldness of image, but by bearing a rougher handling in the water. With English, French, and German paper these peculiarities of the negative and positive kinds will hold good. It will be obvious, from the above remarks, that each of the two papers has its special advantages and disadvantages, and it is for the photographer to select according to his requirements.

The papers generally used are English, French, and German. Each has its own character. Belgian papers are also in use, but the makers imitate either the French or German; and in proportion as they approach either, so are they generally classified. English papers are not now much in general use. During the pre-Collodion period, however, they were in great repute. Old calotypists used to gloat over their reams of Turner and Whatman; for, like some

other good things, the paper was held to be better the older it was. Musty old-fashioned stationers' shops in back streets, out-of the-way neighbourhoods, and distant villages used to be explored, and the dustiest and darkest corners hunted out to discover some forgotten ream from the famous Chafford Mills. Continental calotypists (there were no *photographers* in those days) took their stand on "Papier Anglais;" but all this has passed away, and with it the reputation of English paper. With Collodion came in Rive, and Canson, and Saxe. The English paper was not found adapted for the new era:—it would not tone; would give red foxy pictures; was coarse on the face; was sized with gelatine; was of awkward size; and would not cut up profitably. Thus, with some show of reason, English paper got elbowed out; but we cannot doubt, when the paper duty is removed, the same improvements will occur that took place in the glass trade, and that many patriotic paper makers will volunteer, in self-"defence, not defiance," to stop the invasion of the French—paper.

The fact is certain that the bulk of the paper we photographically consume is imported. The reason why we are so dependent will, in some degree, be made apparent in the next article, when we discuss in detail the peculiarities of English, French, and German paper.

ON FIXING POSITIVE PROOFS.

By MM. Davanne and Girard.

We have shown by our preceding studies that, among the various fixing agents which may be employed in photography, the best is hyposulphite of soda. We cannot, however, assert that it is absolutely good; for in our last essay we enumerated various causes which may bring about its decomposition, and consequently destroy the proofs.

These causes of decomposition are:—

1. The action of light, solar or diffused.
2. The presence of nitric acid in the printed proof.
3. The total saturation of the hyposulphite of soda by the salts of silver.
4. The local or accidental saturation resulting from interposed bubbles of air, from the proofs sticking together, from being partially immersed, and from the solution of hypo. being too weak.
5. The presence of free sulphur or thionic compounds, caused by anterior decomposition.
6. The voluntary or accidental addition of any acid.

Therefore, in practice, we must protect ourselves as much as possible from these causes of alteration; and we shall now examine the rational conditions of good fixing from the moment of taking the print out of the printing-frame, and of observing that, hitherto, we have only considered the subject of toning.

I. *Modifications to which the proof must be submitted before fixing.*—Our first care must be to remove the black solarised margins from the proofs, or, what is better, avoid them by covering up the margins of the sensitised paper in the printing-frame with a border of black or yellow paper to admit the negative. We thus prevent the solarised margins from acting upon the successive baths wastefully, especially on the toning-bath, which they influence more than all the rest of the proof.

The positive proof, on removal from the printing-frame, contains, on the one hand, chloride of silver, metallic silver, and a combination of silver with organic matter: these three compounds are insoluble, and have no direct action upon the hyposulphite of soda. On the other hand, it contains nitrate of silver and free nitric acid, the action of which on the hypo. is immediate: it is easy to remove these two latter bodies, or render them inoffensive. It is sufficient to wash the proofs first in plain water, and then in a bath composed of

Bicarbonate of soda	1 part.
Chloride of sodium	5 parts.
Water	100 parts.

The reaction upon the soluble compounds takes place immediately the nitrate of silver is transformed into chloride of silver, and the nitric acid into nitrate of soda. We may employ simply a solution of bicarbonate of soda in water; then the nitrate of silver will be transformed into the insoluble carbonate, and the nitric acid be neutralised as before, but especially if the preliminary washing be omitted. In that case we must increase the dose of the alkaline bicarbonate, which may act upon the sizing of the paper; therefore we prefer to employ it weak, with an excess of chloride of sodium.*

* *We have satisfied ourselves, by direct experiment, that if nitrate of silver be added to a mixture of chloride of sodium and bicarbonate of soda, the precipitate formed consists almost exclusively of chloride, and of a minimum proportion of carbonate of silver*

The employment of the preliminary washing in pure water will secure the same weight of hyposulphite of soda, fixing double the number of proofs; but if it be found that this washing complicates the operation, it may be omitted, and the proof be passed immediately into the solution of bicarbonate of soda and salt: the silver passing thus from the soluble into the insoluble state, will have no other injurious action on the hypo.-bath than that of saturating it more rapidly.

II. *Concentration of the bath of hyposulphite of soda.*—We know theoretically that the solution of hyposulphite of soda must be concentrated: it is necessary that it should act rapidly, and that the hyposulphite of silver be dissolved immediately it is formed in the substance of the paper. Our experiments were made upon solutions of 5, 10, 15, and 20 per cent.: this last strength appeared to give the best results, and we stopped at it, although there was nothing absolute in it; it is a medium strength, and may be diminished or augmented without any inconvenience. This solution is filtered into a dish large enough for the proof to float in it freely without touching the edges. The quantity of solution must be proportionate to the number of proofs: in any case they must float freely.

The fixing should be carried on in a room lighted by yellow glass windows, so that a very feeble diffused light falls upon the dish. The proof, on its removal from the solution of bicarbonate of soda, must be immediately immersed in the hypo.-bath, carefully avoiding the formation of air-bubbles, adherence to the sides of the dish, and every cause that will prevent the liquid from coming in contact with both sides of the proof.

We may put several proofs at a time into the fixing-bath, but it is preferable to put in as few as possible, to avoid local saturation of the hyposulphite of soda, and the colour of the proofs will be fresher. It will be better to put only two back to back; that will not prevent quick working, as each sheet remains but a short time in the bath.

III. *Time of fixing, and its influence.*—In every experiment we have made, we have found that, after an immersion of ten minutes in the solution of hyposulphite of soda, the proofs obtained in the ordinary way, even without previous washing in pure water, were completely fixed; it is, therefore, only in exceptional cases, as in employing excessively thick paper, of concentrated baths of soluble chloride, or of nitrate of silver, that we must consider how long it will be advisable to prolong the fixing, which, as observed by M. Le Gray, should be as brief as possible. Too prolonged a stay in the bath of hyposulphite of soda will have a twofold injurious effect on the proof: first, in destroying its vigour, by partially removing the half-tones; and, if it must be toned after fixing, will render this toning if not impossible at least very difficult, and not so good. If the impression be too vigorous it must not then be weakened by a prolonged immersion in the hyposulphite of soda, but some other means must be employed* after the fixing.

(*To be continued.*)

ON THE ACTION OF THE ACETO-NITRATE BATH IN THE COLLODIO-ALBUMEN PROCESS.

By John Parry.

[Read at a Meeting of the Manchester Photographic Society, September 5, 1860.]

Some time ago, on preparing a few plates for printing transparencies by the collodio-albumen process, I accidentally removed part of the collodion film in the washing, after having sensitised in the ordinary thirty-grain silver bath. As the damage was but slight I completed the preparation of the plate in the usual way, and exposed it; but on developing I was much surprised to find I had little or no impression on the part from which the collodion had been removed, although the other portion of the plate developed in the usual manner.

I named this fact to several of my friends at the time, but paid no further attention to it then. Since, I resolved to make a few trials on this subject; for it would appear from the above that the only use of the aceto-nitrate bath is to coagulate the albumen, and if so, what is the maximum strength required for that purpose? The bath I had in use at that time was about fifty grains to the ounce of water: I therefore took half an ounce of it and added four and a-half ounces of water, making it about five and a-half grains to the ounce. I dipped one of the usual albumenised plates half way into the fifty-grain bath, allowed it to remain the usual time, removed and washed that part only—first in a dish, and after-

* *The very weak solution of iodised cyanide of potassium, proposed by M. Humbert de Molard, yields excellent results. We can employ, also, a weak solution of cyanide of potassium, of hypochloride of lime, or a concentrated solution of chloride of sodium.*

wards under a tap, allowing it to drain a few minutes. I now dipped the other end of the plate into the five and a-half grain bath, washed as before, and allowed the plate to dry. Next morning I placed this plate in the pressure frame, under a good even negative, previously marking the end which had been dipped in the five and a-half-grain aceto-nitrate bath. In developing I was not a little surprised to find the end I had marked came out first, and continued to do so, far outstripping the other in development.

I began to think I must have made some mistake, and resolved to try it over again. I now prepared an entire new aceto-nitrate bath, six grains to the ounce of water, and proceeded as in the first instance, marking the plate previous to dipping in the two baths. The result was precisely as before. Since then I have tried it in a great number of ways, but always with the same result. In my hands the weak bath has a greater tendency to blister, and the picture is on the surface, and not in the body of the film. This is remarkable, as the first experiment proves the picture to be at least on the collodion side of the film, if not in the body of the collodion alone.

I noticed, also, in two of my experimental plates, that at the junction of the two solutions the plate was quite insensitive to light, as may be seen on No. 2 and 3 [plates here produced]. But I did not succeed in repeating that on trial. It would thus appear that a much weaker bath will answer the purpose better than the one generally used. What may be the best strength I have not yet satisfied myself with by experiment; but have now reduced the one I have in use to twenty grains the ounce, and think I may reduce it still more.

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.

Report of the Committee, consisting of Messrs. Maskelyne, Hadow, Hardwich, *and* Llewelyn.

(*Continued from page* 254.)

The usual sensitive surface contains, if it does not consist in, iodide of silver with an excess of nitrate. But there are processes in which the plate is studiously washed with water to remove the nitrate, whereby, though it is impaired in sensitiveness, it retains enough of that quality for the production of excellent results. Though this retention of a susceptibility to the invisible impression has been attributed to mechanical causes, such as the state of division of the iodide, the porosity of the film, &c., the following facts seem to favour a chemical explanation:—Pure pyroxyline united with pure iodide and nitrate of silver, from which the nitrate of silver has subsequently been removed, and the film dried, is not susceptible of quick development after exposure in the camera; a mere trace of albumen introduced before the removal of the soluble silver salt, however, prevents its entirely losing this susceptibility. Gelatine, certain forms of sugar, resins, and various other bodies widely differing from one another in point of chemical character, possess a similar property, though the precise regulation of the processes employing them can hardly be said to be as yet mastered by the photographist. The products of decomposition contained in "old collodions," and some of the fresh preparations of pyroxyline, in which secondary products are not studiously prevented from being formed, would seem to share this power with the classes of bodies referred to.

But a question of the utmost interest to the scientific inquirer is involved in the chemistry of the iodide of silver: first, in respect to its power of forming combinations with the nitrate of silver; and, secondly, as regards the probability of these combinations forming photographic compounds with the albumenous and other bodies alluded to.

That the excess of nitrate of silver which is necessary in the *first* preparation of all the sensitive films does not act the same part as that excess does in the case of the chloride in direct processes, will be evident at once, inasmuch as the iodide of silver does not undergo reduction in the manner that the chloride does. In searching, therefore, for an explanation of the necessity of free nitrate, the mind naturally dwells on the compounds shown by Schnauss* and A. Kremer† to be formed by the action of strong solution of nitrate of silver on the iodide. Although the production of these bodies in any quantity and in a state of chemical purity needs conditions not present on the photographic film, yet there seems little doubt that, as iodide of silver is dissolved by the nitrate, traces of these remarkable compounds can readily exist in the films containing these two ingredients. If so, the highly photographic character of the compound containing 2·8 per cent. of iodide of silver described by Kremer, and the fact of these bodies being decomposed with the separation of iodide of silver by the action of water, are facts of high interest to the photographic chemist, and seem to throw considerable light on the hitherto obscure processes in which iodide of silver is employed. These two facts, indeed, may be held to explain, very nearly, the character of the ordinary collodion process, but they do not explain the "preservative" processes in which the sensitiveness of the film is, within certain limits, retained by the introduction of albumen, gelatine, resin, sugars, or other organic substances, to the numbers of which experience is continually adding.

For the explanation of the action of these substances we must recur to the facts already cited in the case of gelatine when used as a size in the direct processes. Thus, too, a plate coated in the ordinary manner with albumen containing iodide of potassium dissolved, will be found, on being raised from out of the silver bath, not to be opaque, and coated with a dense deposit of iodide of silver, but to appear highly translucent and opalescent in its character, and that even though the iodide be introduced with a liberal hand. In fact, the albumen is present not merely as a mechanical vehicle for the sensitive materials, but can be proved to have combined with those materials, and to play no insignificant part in their photochemical transformation. That this is so may be at once shown by adding some albumen to a quantity of the ordinary "silver bath,"—say the white of one egg, diluted with 1½ ounce of water, added to 40 ounces of bath. The iodide of silver with which the bath was previously saturated will be found in it no more: it is now to be looked for in the gelatinous precipitate which the albumen has formed. The precipitate is in fact a chemical compound of albumen with nitrate of silver holding in combination the iodide. This is, as might be supposed from what has been said of the albuminate alone, a highly photographic compound. We have stated that a similar compound is formed by gelatino-nitrate of silver and iodide of silver. Citrate of silver, glycyrhizine, and many other bodies share with these substances, and the first two possess even in a far higher degree than they the property of carrying down in a combination—or, so to say, in solid solution—the iodide of silver, and forming with it highly photographic products.

(*To be continued.*)

* Archiv der Pharm. xcii. 260.

† Journ. für Prakt. Chem. lxxi. 54.

EXPERIMENTS AND CONCLUSIONS ON BINOCULAR VISION.

By Professor William B. Rogers.

[Read before Section A, at the Oxford Meeting of the British Association for the Advancement of Science.]

The following experiments, intended to test the theory of the successive combination of corresponding points in stereoscopic vision, are I believe in part new, and are in part modified repetitions of experiments already described by Professor Wheatstone and Professor Dove.

1. Let two slightly inclined luminous lines, formed by narrow slits in a strip of black card board, be combined into a perspective line, either with or without a stereoscope. Looking at this for a few seconds, so as to induce the reverse ocular spectrum, and then directing the eyes towards the opposite wall of the apartment, a single spectrum will be observed having the attitude and relief of the original binocular resultant.

As a strong illumination of the lines is necessary to bring out the full effect, the card board should be held between the eyes and some brilliantly white surface, as the globe of a solar lamp or a strongly illuminated cloud, care being taken to prevent the entrance of extraneous light.

2. Using the same arrangement, let the luminous lines be regarded *in succession*, each by the corresponding eye, the other eye being shaded so that no direct binocular combination can be formed. On looking towards the wall it will be seen that *the two subjective images unite to form a single spectral line, having the same relief as if the lines had been directly combined* by simultaneous vision, either with or without a stereoscope.

While the perspective image continues distinctly visible, let either eye be closed, the other being still directed towards the wall. The image will intantly lose its relief, and take its position on the plane of the wall as an inclined line, corresponding to the subjective image in the eye that has remained open. When the subjective impressions have been sufficiently strong, it is easy to

alternate these effects, by projecting first the picture proper to the right eye, then that of the left, on the plane of the wall, with their respective contrary inclinations, and then looking with both eyes we see the resultant image start forth in its perspective attitude.

It is hardly necessary to say that, to obtain these effects satisfactorily, the lines should be very strongly illuminated, and the observer should have some practice in experiments on subjective vision. Under these conditions I have found the results to *be perfectly certain and uniform.*

In these experiments, according to the theory of Sir David Brewster, the resultant spectrum, instead of being a single line in a perspective position, ought to present the form of two lines inclined or crossing, situated in the plane of the wall without projection or relief. The conditions of the experiments are such as to exclude all opportunity of *a shifting of the image on the retina*, and such shifting is obviously essential to the successive combination of pairs of points required by the theory in the production of perspective effect.

In reference to the first experiment, it might perhaps be maintained that, as the perspectiveness of the original resultant on which the eyes were conveyed formed part of the direct perception in first combining the lines, it would be likely through association to be included also in the spectral or subjective perception. But this consideration, which at best appears to me of little weight, is entirely inapplicable to the conditions of the second experiment. For here the eyes are in the first place impressed *in succession* with their respective images, and are not allowed to see the resultant; and yet, when they are together directed to the wall, *the perception of the single perspective resultant is at once originated.*

3. Without resorting to these troublesome efforts of subjective vision, the following experiment furnishes, as I think, conclusive proof that pictures successively impressed on the respective eyes are sufficient for the stereoscopic effect.

Let an opaque screen be made to vibrate or revolve somewhat rapidly between the eyes and the twin pictures of a stereoscopic drawing, so as alternately to expose and cover each, while it completely excludes the simultaneous vision of any parts of the two. *The stereoscopic relief will be as apparent in these conditions as when the moving screen is withdrawn.* Here, at each moment, the actual impression in the one eye and the retained impression in the other form the elements of the perspective resultant perceived.

It seems clearly inferrable from these experiments that the perception of the resultant in its proper relief does not require that each pair of corresponding points should be combined by directing the optic axes to them pair by pair in succession, as has been maintained. Nor is it necessary for the singleness of the resultant perception that the images of corresponding points of the objects should fall on what are called corresponding points of the retinæ. The condition of single vision in such cases seems to be simply this, *that the pictures in the two eyes shall be such and so placed as to be identical with the pictures which the real object would form, if placed at a given distance, and in a given attitude before the eyes.*

4. I have of late frequently repeated Dove's experiments with instantaneous illumination, leading, as is well known, to similar conclusions. In these I have found it most convenient to use the momentary bright flash of the Leyden bottle, connected with the Ruhmkorff coil according to Grove's plan. With a powerful coil of Ritchie's construction, and a brass disc 8 inches in diameter, having the usual concentric striation, I am able, even with a single flash, to see the luminous line in perspective, and by a quick succession of flashes I can have it as steadily before me as if illuminated by the sun.

A twin-drawing, of a simple geometrical solid, placed in the stereoscope, and illuminated by the same means, appears single and in just relief in all cases where the flashes recur at short intervals, and very frequently presents the same appearance even with a single momentary light.

To be assured that the effect was not due to the *recollection* of a previous stereoscopic impression, I have caused slides to be introduced of which the form could not be thus anticipated, and still have had no difficulty in describing the perspective resultant as exhibited by the instantaneous illumination.

5. On the inability of the eyes to determine which retina is impressed.

Let a small disc of white paper be fastened on a slip of black pasteboard, of the size of a stereoscopic slide, and let this be so placed in the instrument as to bring the disc centrally in front of one of the glasses, *the person who is to view it being kept in ignorance of the position of the spot.* On looking into the instrument, he will think he sees it with both eyes equally, and, without resorting to the expedient of closing his eyes alternately, will be *entirely unable to determine whether the spot is before his right eye or his left eye.* The spot appears to be placed in the mesial or binocular direction, and in the same position as that of the resultant image of two such discs, presented severally to the two eyes.

It may be concluded from this that the mere retinal impression on either eye is unaccompanied by any conscious reference to the special surface impressed, and that the visual perception belongs to that part of the optical apparatus, near or within the brain, which belongs in common to both eyes.

This experiment is, moreover, interesting from its bearing on the *law of visible direction.* It shows that the sense of direction is just as truly normal to the central part of the retina that has received no light from the object as to the part of the other retina upon which the white spot has been actually painted by the rays. In truth, *it is normal to neither*, but is felt to be in the middle line, between the two—that is, in the binocular direction. This experiment, therefore, contradicts the law which assumes that the direction in which an object appears is always in the normal to the point of the retina impressed.

LIQUID FOR CLEANING GLASSES.

By W. Miers.

The following preparation will be found very efficient for cleaning glass plates, particularly those that have been employed for collodion positives with iron developers:—

Water	1 ounce.
Hydrochloric acid	2 drachms.
Iodine	A few grains.

Rub the plates over with a pad of cloth saturated with the liquid, using a circular motion, and polish as usual.

ON THE DRY PROCESSES.

By Hill Norris, M.D.

The following letter and paper, which we received a few days back, appear to contain matter of such general interest, especially in reference to the experiments of Messrs. Petschler and Mann, that, although the latter was read just three years since, finding it has not yet appeared in these columns, we have determined on now publishing both, having obtained the requisite permission.

My dear Sir,—I take the liberty of forwarding you for perusal an old communication of mine to the Society here in September, 1857. It has, I think, a direct bearing on the recent experiments with chlorides. I am inclined to think that the effect observed is wholly due to the very potent action exercised by chlorides in removing the *excitation* induced by light. I have long noticed that if exposed plates were wetted with *common water*, and *re-dried*, the image was in most instances obliterated, while no such effect occurred with *distilled water.* A plate that has been well washed, and then treated with chloride, will contain a great excess of chloride (alkaline), owing to the concentration induced by the drying. I have found that one-third of a grain of chloride of ammonium in an ounce of the preservative wlil prevent the development of the image, and I have been in the habit of attributing this action simply to the effect of the chloride in *removing the image* at the *moment* of being *re-wetted*, not to any opposition to the action of light. It is difficult to understand how acids and their vapours, chlorides, &c., can remove the latent image, if we look upon it (the image) as being the result of a true decomposition; but it is not difficult if we view it as only an "electrical excitation"—a view that is daily taking stronger hold of my mind, and which every new fact tends to prove.

It gives me much pleasure to see you urging the daguerreotype as an example of pure iodide and bromide of silver being sensitive. We could not possibly have a more convincing proof freer from sources of error.

I am, yours, &c., HILL NORRIS, M.D.

Birmingham, September 4, 1860.

As the subject of dry collodion is now so thoroughly on the *tapis*, and many erroneous views in regard to its chemistry are prevailing, it may not be amiss for us this evening to investigate a little this part of the subject. Perhaps the most important question we can draw attention to is that of the sensitiveness or non-sensitiveness of pure iodide of silver to the actinic force, and on the thorough elucidation of this hitherto debatable point depends the future of dry photography.

It has for years been my effort to produce an "actinic tablet" of pure iodide of silver capable of retaining its property of receiving

impressions for an indefinite period, and retaining intact the impressed surface without alteration. This I may say I have succeeded perfectly in doing, as my plates are not found to deteriorate after a period of twelve months. This keeping property is due solely to the very stable character of iodide of silver, uncontaminated by the nitrate of that metal, or other foreign salt. You are aware that I have long advocated the removal of all free nitrate by copious washing, and this not from any unfounded prejudice, but from direct experimental comparison between plates containing large and small proportions of this salt with others in which it was entirely absent; and these experiments, repeated under every variety of condition, have invariably decided against the use of free nitrate in *absolutely* dry processes.

We will endeavour this evening to establish the following propositions:—

1. Pure iodide of silver, although not capable of blackening in the solar ray, is nevertheless in its nature sensitive to the actinic force so far as the production of latent images is concerned.

2. Nitrate of silver does not, in *dry processes,* hasten this action, or give intensity, but is retardative and injurious.

3. That many substances have the power of destroying the actinic impression subsequent to production, and of preventing its formation.

At an early period of my experiments I noticed that, if a dry plate were exposed to light under a negative, and afterwards immersed in a solution of bi-chloride of mercury, the latent image was destroyed. The same plate being well freed by washing from this salt, and again exposed, yielded an excellent positive. Pursuing this clue I find that iodide of potassium, in fact all soluble iodides, nitrate of silver, all acids, including the pyrogallic, and many salts, possess this quality in an eminent degree. Hence the discordant opinions in regard to the impressibility of pure iodide of silver. To prove that iodide of silver *is* sensitive to light, I proceed as follows:—Taking a collodion plate, I wash away as nearly as possible all free nitrate, and then immerse in a bath of iodide of potassium to neutralise the remainder. I now wash it repeatedly with distilled boiling water to remove this salt, and on exposure find the picture is as quickly and readily obtained as if no iodide of potassium had been used. Again, I take a plate, expose, wash, pour over one half only a solution of iodide of potassium; and wash thoroughly and carefully, so as not to contaminate the other half of the plate with the potassium. On development the part treated with potassium remains clear and white, the remainder blackens. Now remove by washing all developing solution from the plate; expose again, and in its turn the part previously preserved will blacken under the action of the developer. The first experiment shows that pure iodide of silver IS SENSITIVE to light. The second shows that iodide of potassium is obnoxious to the actinic impression, preventing its production, and if applied after exposure restoring the plate again to its normal condition. This is perfectly analogous to the action of the bi-chloride of mercury, and bears a striking similarity to the restoration of the daguerreotype plate by the fumes of iodine. Again, how can we on any other hypothesis explain the facts presented in the collodio-albumen process. These plates may (save the last sensitising or the final neutralisation of the alkaline iodide) be entirely prepared in the light. During the first sensitising of the plate in the nitrate bath, and its subsequent washing, it must have evidently been influenced by the actinic force, *but it is at once restored to its normal condition by the application of the albumen containing the alkaline iodide.* It is a singular fact that our very developing agents, chiefly due to the acetic acid, possess this quality in a marked degree, and this is the case with pyrogallic acid, although not apparent in the ordinary wet process, owing to the development commencing *instantaneously;* but if a dry plate be properly exposed, half of it flooded over with pyrogallic solution containing no silver, and allowed to remain on a few minutes, on developing with fresh pyro, containing silver, the part on which the simple pyrogallic was first flooded will be found nearly obliterated, while the other will come up strong and intense. A very effective way of showing this experiment is by spotting a plate with the pyrogallic before adding the silver. I exhibit such a plate for your instruction. In the spotted parts you observe the picture is nearly obliterated. Nitrate of silver, when acid, has also this property of conducting off the image; therefore in all experiments instituted for ascertaining the influence of actinism on pure iodide of silver, these facts must be taken into account, and the developing agent, silver, must be presented to the iodide *simultaneously.* Whatever the peculiar latent image may be shown to be, one thing is evident, that causes, apparently trifling, are capable of the most magnitudinous results. In M. Davanne's theory of the reduction of a portion of the iodide of silver to the metallic state, as constituting the basic image, I do not concur. If this theory be correct a visible picture should at length, without development, by a still further reduction of the iodide be produced, or at least the attractive force for molecules of silver should increase in the ratio of the exposure, and in a definite direction. When *nitrate of silver* is present in a film of iodide I am aware the picture will become visible by exposure alone; but this is owing to the direct action of light:—firstly, in its capacity of producing a latent image, having the power of molecular attractions; and secondly, as a developer in reducing the nitrate, and so presenting the minute molecules of silver to the attracting image or force. Pure iodide of silver can never be blackened as chloride and nitrate can, but it is nevertheless capable of receiving latent impressions much more readily than these substances. M. Davanne's conclusions that iodide of silver is slightly blackened by the solar rays is founded on experiments to which I take exception, because he used, in connexion with the iodide coagulated albumen, or in other words, a compound of proto-oxide of silver and albumen, which itself would blacken by exposure.

The latent image on a dry collodionised plate of pure iodide of silver will not become visible by any amount of exposure, but is as recurring as the colour on a daguerreotype plate. For instance, if a plate be exposed under a negative, for a few seconds, the picture, on development, will be positive; for a few minutes, and it will be negative; and so the changes may be rung, proving it I think to be an electrical and not a chemical phenomenon. These changes on a dry plate are distinct and definite, exhibiting this principle much better than wet plates.

On this subject I have much more to say, but as time will not permit in this paper I will now hasten on to the consideration of the pyroxyline best suited for dry operations.

Solubility in pyroxyline lies within a small compass, and depends entirely on the strength of the nitric acid. Too strong, it will be insoluble, but very explosive. Too weak, and the cotton dissolves in the acids. Then, again, there are two kinds of pyroxyline—the contractile and the porous—and each of these is subdivisible into the fluid and the glutinous. Hence, to make myself understood, I will classify them as follows:—the fluid contractile comes from hot strong acids; the glutinous contractile from cooler or cold strong acids; the fluid porous from hot weak acids; the glutinous porous from cooler or cold weak acids. *Ergo*, an acid mixture which when used cool gives a glutinous contractile, will, when used hot, give a fluid contractile. An acid mixture, which when cool produces a glutinous porous, will, when hot, produce a fluid porous kind.

Let the line A B represent a portion of a thermometer, ranging from 80 to 170°.

	A	
Fluid contractile	170 160 150 140 130	Extreme peroxidation within the limits of solubility with close impaction of constituent atoms by the action of hot sulphuric acid.
Glutinous contractile	120 110 100 90 80	Same degree of peroxidation with loose state of constituent atoms, owing to the sulphuric acid being cooler.
	B	

It would therefore appear that contractility depends for existence on a strong nitric acid, just capable of giving a soluble compound, while a porous pyroxyline depends upon a weaker acid; or, in other words, contractility is extreme peroxidation within the limits of solubility. Porosity lies below this point in variable degrees, and in proportion to its distance so does the porosity increase, or the less peroxidised the cotton, the more porous.

The acid mixture is here to be considered as the strongest sample capable of giving a soluble product. From 80 to 120 the pyroxyline will be more or less glutinous, but above this point it will be tolerably fluid, increasing in this quality up to 160, above which point it will dissolve. It will be found that collodion prepared from any of the above specimens of pyroxyline will not develop in dry processes. Now add to the above acid mixture a portion of water and the changed conditions may be thus expressed:—

A

Fluid porous	170 160 150 140 130	Lower degree of peroxidation, with impaction of constituent atoms by the action of hot sulphuric acid.
Glutinous porous	120 110 100 90 80	Same degree of peroxidation with loose state of constituent atoms owing to the sulphuric acid.

B

If the acid mixture dissolves the cotton, on raising the temperature to 160°, it is too weak. Any of the pyroxyline of this last formula will develop, but of course the *fluid* porous is the one to be chosen, and the collodion may be made as follows :—

Rectified ether ....6 drachms.
Alcohol (absolute).................................2 „
Cotton (soluble)....................................6 to 8 grs.
Iodide (cadmium) ....6 grains.

It will be ready for use in about a week, but improves by longer keeping. The best preservative solution is made by dissolving 80 grains of gelatine in 20 ounces of distilled water, heating to the boiling point, and filtering while hot through two thicknesses of bibulous paper. It should then be carefully boiled down to half the quantity, stirring well with a glass rod. When cooled down a little it should be poured into a bottle containing 1½ ounces of alcohol, and the whole shaken up well together.

We will now proceed at once to the *modus operandi :*—

1st Operation.—To clean the plates, place them for a few hours in a strong solution of washing soda, and while in, rub the surfaces well with a pledget of rag. Wash well to free from the soda, and then dry upon cloths that have been washed without soap; finally polish with a piece of old silk or wash leather.

2nd Operation.—The coating with collodion and sensitising in the nitrate bath is conducted precisely as in the ordinary wet process; and as the collodion does not contain acetic naptha, camphor, or other foreign body, the usual negative silver bath may be employed without running the risk of spoiling for the wet process.

3rd Operation.—For washing away all free nitrate of silver from the plate, provide three flat dishes of porcelain or gutta percha, and fill with pure distilled water (not common or rain water). Take the plate from the bath and permit it to drain for two minutes, and then immerse in the first dish of distilled water. Proceed now to prepare a second plate in the nitrate bath, and when this is ready, transfer the former plate to the second dish of distilled water, and so on till the first plate has passed into the third dish. The first water must not be used more than three times, when its dish must be washed out and refilled, and placed for the third or last swilling. When the plate is removed from the first water, it should be slightly washed, back and front, with distilled water, kept in a jug for the purpose, so that as little nitrate of silver as possible may be conveyed into the second water. While the plates are soaking, a rocking motion should be given to the dishes occasionally. The plate having remained for about five minutes in the third water, should now be taken out, and the surface slightly swilled. It is now, after draining about a minute, ready for the fourth operation.

4th Operation.—*Coating with Gelatine.*—To do this successfully, the gelatine solution must be made very hot (no fear need be entertained of blackening from this cause). The gelatine solution may be readily heated by placing a bottle of it in a saucepan of boiling water. The capacity of the bottle must depend upon the size of the plates under preparation. It must be understood that the gelatine is not heated simply to liquify it, but because it penetrates better into the pores of the plate, and the plate being heated dries more readily and evenly. Now take up the slightly-drained plate, and pour on one end sufficient of the hot gelatine solution to cover the whole surface, and impart to the glass a degree of warmth, float backwards and forwards for two or three minutes, and pour off by the opposite end into the waste pan; reverse the plate and repeat this operation, with the exception that the solution this time may be saved for the first application to the next plate. The plate is now ready for the last operation, viz., that of drying. This may be done either spontaneously or by artificial heat; in either case the plate must be reared up, face outwards, on one corner, in a very clean place. If prepared at night, they may readily be dried by an ordinary brisk fire, at the distance of about two feet. When dry, they should be securely packed, and will keep indefinitely.

Exposure in the camera.—From 50 to 150 seconds in bright sunlight will generally be found sufficient, although some objects will require as much as four or five minutes under the same conditions, viz.: with a stereoscopic view lens of six inches focus, and a quarter-inch aperture; with a large lens, twenty-one inches focus, inch aperture, in good light, from one and a-half to two minutes; with three-eighths aperture, from eight to twenty minutes.

Development of the latent image.—Wet the plate by immersion in a flat dish of distilled water (common or rain water will not do), drain for one minute, and then pour over a sufficient quantity of the following developing solution :—

Pyrogallic acid.............. ....3 grains,
Distilled water ....2 ounces,
Glacial acetic acid ....1 drachm,

having previously mixed with each drachm required three drops of a forty-grain solution of nitrate of silver. If this mixture should go muddy, it must be thrown away, and the measure well cleaned with cyanide of potassium solution. For stereoscopic plates, about two drachms of pyrogallic solution will suffice, and to this quantity six drops of nitrate of silver solution must be added. This mixture should be poured on to the plate at the end farthest from the body; off again at the other end; and opposite part to the first. The plate must not be put on a levelling stand, but kept in constant motion; and, if any inequality is observed in the development, let the solution be transferred to the measure, and poured on repeatedly at that particular point till the development is equalised. When the action of this first dose appears exhausted, apply a second quantity, containing six drops of silver solution to the drachm. This will rapidly intensify and complete the development. Now wash and fix with cyanide of potassium, five or six grains to the ounce of water, or with strong solution of hyposulphite of soda. When the fixing solution has removed the greater body of the yellow iodide, swill off, and apply again only to those parts where it still remains, as a prolonged action of this agent weakens the negative too much. The plate may now be dried, and varnished with the ordinary French varnish. If time is not an object, very beautiful results may be obtained by developing with a saturated solution of gallic acid, to every ounce of which ten drops of the nitrate of silver solution have been added. This must be conducted in a flat dish, as the development may occupy an hour or more.

CELESTIAL AND INSTANTANEOUS PHOTOGRAPHY.

By Warren De la Rue, Esq., F.R.S., F.R.A.S., &c.

(Continued from page 252.)

Desiderata in the Machinery for Driving the Telescope.

As in the production of celestial photographs some seconds of exposure are requisite, it is essential to have a clock-work driver to the telescope, which works uniformly and smoothly, and which is also capable, when lunar pictures are to be taken, of ready adjustment to the ever-varying lunar time. Lunar time, it will be recollected, differs from sidereal time, in consequence of the moon's variable motion in her orbit in a direction opposite to that of the apparent diurnal movement of the stars. A driving clock, if adjusted to follow a star, must be retarded therefore, more or less, in order to follow the moon. In my own telescope, this is at present effected by altering the length of the conical pendulum or friction governor, thus altering the time of its rotation (or double beat), and this plan, or some modification of it, is universal. My experience, however, has pointed out several inconveniences in thus changing the speed of the governor or pendulum, and it is my intention to make such alterations in the construction of the clock as will enable me to alter the going of the telescope without changing the rate of the pendulum. This I propose to do by substituting an arrangement, similar to that known in mechanism as the disc and plate, for the wheel-work now connecting the machinery of the clock with the pendulum; the disc and plate being capable of producing a variable motion, according as the disc is nearer to or farther from the centre of the plate. The pendulum will, by the proposed plan, be driven by frictional contact, and, having employed this system in other machinery, I feel persuaded that its application to the clock-driver will not be attended with difficulty or inconvenience.

The moon, besides her motion in right ascension, has also a motion in declination, which is greatest when she is situated in one of the nodes formed by the intersection of the plane of the

moon's orbit and the plane of the earth's equator, and is least when situated 90° from these nodes, where it vanishes. As this motion is at times very considerable, it is evident that, with a telescope made only to rotate round the polar axis, the best results will be obtained, all other circumstances being alike, when the motion in declination is at zero. Assuming that, on the average, 15 seconds are necessary for taking a lunar photograph, the moon may have shifted upwards of 4 seconds of arc in declination during that period; and evidently many details would be lost and the others considerably distorted. In order to ensure the most perfect results under all circumstances, it is desirable to give a movement to the declination axis of the telescope simultaneously with the movement of the polar axis. Hitherto, so far as I am aware, no means have been devised to effect this, but the requisite adjustable motion might be transmitted by means of the disc and plate above described, from the driving-clock, although its pendulum moves with a uniform velocity.

Lord Rosse's Method.—In my original method of taking the pictures by means of the sliding eye-piece before spoken of, both motions in right ascension and declination were provided for by adjusting the slide in the diagonal parallel with the moon's apparent path. Lord Rosse, at a subsequent period, applied a clock-movement to such a slide, and made some experiments in celestial photography;* but, the telescope being required for other special purposes, it appears that they were not long continued. This motion of the plate-holder does not meet all the exigencies of the case, but if one of his magnificent reflectors were arranged to move bodily along a guide adjustable in the direction of the moon's path, by means of some such mechanism as I have alluded to, I believe that lunar pictures might be produced of exquisite beauty, because defects in the collodion film and the glass plate would be of less consequence than with telescopes of shorter focal length, the image being larger in the ratio of focal length; for example, even with the three-foot instrument it would be 3 inches in diameter.

(To be continued.)

* Monthly Notices of the Roy. Ast. Soc. vol. xiv., p. 199.

ON THE QUESTION OF ENLARGEMENT.

By M. Silbermann.

The discussions that have lately taken place on the enlargement of photographs demands some attention. I have observed with regret that operators appear in general to be very ignorant of the appliances long since recorded in the annals of science. Thus the construction of instruments for magnifying images of all kinds is of very remote date. First came the simple magnifying glass, and then the microscopes of various kinds followed:—first simple; afterwards with acromatic lenses; then all those instruments intended to project the image on a plane surface, such as the megascope, the magic lantern, lucernal microscope, solar microscope, &c., of which the camera obscura, the pronopioscope, and the photographic apparatus are only variations or reproductions.

We know that in a positive lens there are two points upon its axis—one in front, the other behind—the distances of which from the lens are connected together by a simple formula, by means of which, knowing the principal focal distance, it is easy, for any position whatever of an object on the axis of this lens, to determine at what distance on the other side of it the image will be reproduced. These two distances are complementary to each other, and the points on the axis where the rays meet are called the conjugate foci. We say, as a fundamental rule, when the object is between the principal focus and the double of this focus the image will take any enlargement, from the natural size to the infinitely great. So, also, if the object is removed double the distance of the focus towards infinity, to become at length, in its turn, infinitely small in relation to the object.

We have only here to consider actual enlargement. For this purpose we must regard our photographic apparatus in a reversed position, or as if the camera was in front of the lens instead of behind it: the screen that receives the image remains in its place in which to fix the object, which is in this case a photographic proof on a plane surface. The new camera, of large dimensions in comparison with the old one, according to the size of the pictures we desire to obtain, will carry at its anterior end the usual arrangements for the focussing screen and sensitive plate.

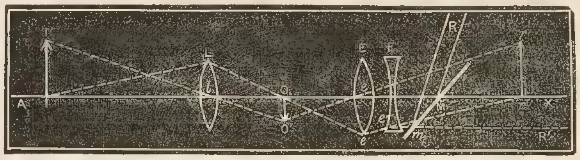
This general arrangement was realised in the megascope, and in the solar and lucernal microscopes, long before our new art came into existence, and we may appropriate what we find useful in them, viz.:—

1. For opaque objects, as proofs on paper, the lighting of the object to be reproduced is effected by plane mirrors, or by concave mirrors, which project a greater quantity of light on the object, to illuminate it better. As the object is opaque, all the rays of light the object reflects back proceed from this object by diffusion, like those which constitute its image. This coincidence between the point of departure of the illuminating rays, added to those of the object, always produces a distinct image, when the lens is well constructed, the focus properly adjusted, and the body quite flat.

2. But when the object is transparent, like the picture on a collodion plate, then its too highly-polished surface sends but very little diffused light, and the circumstances of the preceding case no longer exist; then the borrowed light must necessarily pass through the collodioned glass. Here, then, begins the difficulty of arrangement, which can no longer be a simple plane mirror, because the rays it projects on the back of the glass traverse it in a straight line, and they have their focus at the principal focal distance; then they cross those of the image of which the focus is farther off; and, in consequence of the non-coincidence between the two foci, the image is confused, sharpness no longer exists, and the focal effect is destroyed by extraneous light.

M. Charles, to prevent this effect, and to restore that of diffused light, placed a lenticular illuminator behind the object, first adjusting it so that the additional rays of light formed their focus in the same place as the object to be reproduced. It was afterwards recognised, first by M. Charles, and then by micrographists, that it was not enough to have a perfectly clear image, but that, besides a perfect centering on the same axis, it was necessary that the rays concentrated upon the object should proceed perfectly in harmony with those of the object, and this harmony is only strictly obtained when the illuminating lens, by its size and position, sends all its rays to the object in such a manner that each forms the continuation of that which in part constitutes the image.

The theoretical representation of this effect is given in the annexed diagram:—



Upon the axis, A X, is the object lens, L; the object, O, having its conjugate focus or image in I. I suppose that the illuminating lens, E, is of the same focus as the object lens, and that the distance $O\,e = O\,l$. In this case the illuminating rays must emanate from the point, r, of a luminous body, $r\,r'$, having the same size and extent as the plate in I I′, and be at a distance $O\,r = O\,I$, if it be easy to procure such a well-lighted and well-lighting surface. But as this is scarcely possible, as we have only the parallel rays of the sun and white clouds at our command, we are obliged to collect together the parallel rays, R, by means of a plane mirror, M, placed upon the axis; but these parallel rays, sent by the mirror, will receive a modification in their transit before arriving at the illuminating lens, at which they will arrive as if they had set out from the point, r, on the principal axis, or from the body, $r\,r'$. To do this we must have a concave lens, E′, the divergent power of which must be exactly that required by the difference of the path $e'\,r$. If this condition be realised, we can recognise it; for when we regard the image at I, we then perceive a very sharp representation of the lighting body, at the same time we see the very clear image of the object lighted. This shows that the two kinds of rays are well crossed in O, and that they proceed in harmony from thence to I. We have not then to fear the effects of interference which generally fringe and multiply the lines.

It is understood that the two condensing lenses, E, E′, must be a well-selected achromatic combination. But we see that theoretically we must have a different condensing system for each conjugate focal distance. To obviate this inconvenience in practice, that is, to have less occasion to fear the injurious effects of a given illuminator in cases nearly actual, we make the arrangement of the two condensers moveable, and convert the first lens of it, E, into an achromatic lens. Thus we obtain a tolerable play within and beyond the absolute limits.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

We have to remind the members of the above Association that the next ordinary meeting will be held, as usual, at Myddleton Hall, Islington, on Wednesday, the 26th instant, at eight o'clock in the evening.

Gentlemen wishing to join the Association will please to communicate with the Honorary Secretary—Mr. John Barnett, 9, St. Peter's Terrace, Islington, N.—before the evening of meeting, and, on election, they will be entitled to all numbers of The British Journal of Photography published between the 31st of March last and the end of March, 1861; and also a copy of the presentation photograph, when ready for distribution.

The Committee will meet, for the transaction of business, on Wednesday, the 26th instant, at half-past seven o'clock.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A meeting of the above Society was held in the Rooms of the Literary and Philosophical Society, 36, George Street, on Wednesday, the 5th inst.,—Professor Williamson presiding.

Mr. Isaac Horsfield, Mr. John H. Gilbert, and Mr. J. Kershaw were unanimously elected members of the Society.

The Hon. Secretary laid on the table a large collodio-albumen print, presented to the Society's portfolio by Mr. Joseph Sidebotham, also four large prints presented by Mr. H. Petschler, taken by his new modification of the collodio-albumen process, all of which were much admired.

The thanks of the meeting were given to those gentlemen for their donations.

The Chairman said, if the members of the Society would, in their leisure time, take little picturesque bits of foreground, they would be of much value, and by so doing they would confer a great boon upon artists.

Mr. Sidebotham said artists were often glad to receive assistance from photographers, but, at the same time, were very much in the habit of sneering at their productions.

The Chairman said he could not agree with Mr. Sidebotham on that point; at all events, such was the exception, for he was acquainted with several artists who had frequently acknowledged the valuable assistance they had received from photography, and had expressed a strong desire to possess such photographic scraps to assist them in their studies.

Mr. Mabley said that the Society had no honours or decorations to bestow upon those members of the Society who had distinguished themselves by discoveries which they had made, and he thought, in the case of Mr. Petschler, who had lately made known to them the very novel and important facts in his modification of the collodio-albumen process, it would be a very graceful and proper marking of their appreciation, if they were to elect him forthwith a member of the Council of the Society, there being a vacancy at present. He should therefore propose that Mr. Petschler be elected a member of the Council.

Mr. Sidebotham seconded the motion, which was carried by acclamation.

Mr. Mabley said the editor of The British Journal of Photography had, in his article on Mr. Petschler's process, rather unfairly put the matter before the public. He there insinuated that the matter was only a variation of the Fothergill process; and, though he stated that he did not wish to depreciate the novelty of Mr. Petschler's discovery, yet he did at the same time try rather to detract from some of the merit which he (Mr. Mabley) thought Mr. Petschler was entitled to. No one could fairly deny that the facts disclosed by the communication of Messrs. Petschler and Mann were entirely novel.

Mr. Sidebotham said he quite agreed with Mr. Mabley in his remarks, and thought the matter was not quite fairly put in the article which had appeared in the Journal. As important discoveries were really very rare in photography, it was only proper that the persons communicating them should have the full credit given them.

A general discussion then took place upon the subject of the new process, when it was suggested that some further experiments should be made in a systematic way before the next meeting.

The Chairman called upon Mr. Parry to communicate some experiments which he had been making with reference to the aceto-nitrate bath, as used in the collodio-albumen process.

Mr. Parry then read a paper *On the Action of the Aceto-Nitrate Bath in the Collodio-Albumen Process.* [See page 267.]

After reading his communication, Mr. Parry exhibited several stereoscopic negatives, illustrative of the remarks in his paper.

Many of the members thought the results of Mr. Parry's experiments very important, if a weaker bath than was generally used was sufficient, though the increased liability to blisters was a serious difficulty. A general discussion took place on the subject of the cause and means of preventing the blistering of the film in the collodio-albumen process.

Mr. Griffiths said it had occurred to him, though he had not yet tried it, that developing with alcohol, instead of water, would prevent blisters.

Mr. Neville stated that he had long since tried the plan suggested by Mr. Griffiths, but could not at all succeed in obtaining any trace of a picture.

It was generally stated by Mr. Sidebotham, Mr. Mudd, and other members, that the best plan to avoid blisters was to bake the plate well previously to sensitising the second time, and if the plates had been kept sometime in the half prepared state, always to take the precaution of heating them again before sensitising.

Mr. Mudd said he had lately sensitised some plates which had been kept some time. Some he warmed at the fire, before putting in the aceto-nitrate bath; but he did not take this precaution with all, and those only which he had not so dried, blistered.

Mr. Mabley exhibited some negatives which he had lately taken at the seaside, on some of the plates lately prepared by Dr. Hill Norris, which were said to be as quick as wet collodion. The pictures he produced he had taken in from three to five seconds, and thought this fact was the most wonderful thing which had lately come out in relation to the dry processes. He also developed a plate which he had exposed for only a few seconds that morning at Blackpool.

The thanks of the meeting were given to Mr. Parry for his communication, and also to the chairman for his services, when, after a very interesting meeting, the proceedings closed at a later hour than usual.

LIVERPOOL PHOTOGRAPHIC CLUB.

An ordinary meeting for the month of the above Society took place at the residence of Mr. Forrest, on Tuesday, the 11th inst. There was a full attendance of members.

Mr. Berry exhibited a picture of one of the new street railway omnibuses, thickly clustered with passengers. This was taken with a view lens in the short space of five seconds, without the aid of Maxwell Lyte's instantaneous fluid. The portraits of a large number of the passengers were readily recognised by the several members. He also showed several proofs of negatives of the sun's disc during the late eclipse: these were about five inches square, and exceedingly clear.

Mr. Helsby, lately returned from South America, presented a very clear positive, half-plate size, that had been very successfully transferred to paper. After being blacked at the back with the usual asphalte varnish, the separation from the glass was accomplished by means of varnish of his own composition, which had the effect of making it adhere so closely to the paper that it left the glass without crack or break in the film.

Messrs. Cook laid before the meeting some very clear negatives, of stereoscopic size, prepared according to the method of Messrs. Petschler and Mann, and were disposed to think highly of the principle. The pictures were sharp, clear, and forcible.

Mr. Corey narrated the particulars of some very satisfactory experiments he has pursued on the subject of plates preserved with resin. Having tried them according to the plan recommended by Mr. Glover, at a recent meeting, but with indifferent success, he was about to lay it aside; but the lucid remarks of Mr. Hardwich, in the last edition of his work, caught his attention, where he observed that he advised, what had never been tried by any of the members, viz., redipping in the bath after exposure. This very judicious suggestion tempted another trial, and the result far exceeded his most sanguine expectations. There was no longer a cold, weak, spotted negative, but every part rushed out in full vigour and brilliancy. Nay, more, the same collodion that would produce a tame and medium picture, would now present one of the greatest intensity. Nor was it confined to the same sample, for subsequent trial proved that any collodion that would produce a negative of ordinary quality, provided that it was prepared with pyroxyline of the proper quality, that is to say, prepared with strong acids at rather high temperature, with a brief immersion, so as to give a short pulpy film that would adhere on drying, the rich effect always followed. But it must be observed that a slight washing was not efficacious for a clear picture. A large jug of water must be emptied on it with some force, so as to remove all trace of the free nitrate, and here he was prepared fully to coincide with Mr. Hardwich when he says, at page 375 of his work, after observing in the previous page that this removal was all that could be looked for by the washing, but "that it is not so; for the image" [in full vigour] "cannot be developed after so short an exposure when the pyrogallic acid and nitrate of silver are mixed and applied simultaneously to the plate" * * * "hence that the second dip in the bath has to do, not only with the reduction, but the formation of the image." Now he (Mr. Corey) was entirely of that opinion; and he was further borne out by the experiments of Messrs. Petschler and Mann, who, by their addition of chloride, seek more effectually to get rid of the free nitrate of silver upon their surface, which, by its inevitable crystallisation, would break up the surface, and then, just before exposure, get rid of the insensible chloride; but could only then produce a negative of feeble quality, for lack of the integral part so necessary to the existence of a first-rate negative, with the further drawback of having, as it were, to resensitise the plate by the subsequent washing, a short while before exposure. On the other hand, these were ready to be snatched up at any moment upon the appearance of the genial beam, or the unexpected coming across a favourable object; but if no other recommendation offered itself, the time of exposure would supersede all others, for in every other description of washed plate a range of from five minutes to even twenty was requisite; whereas in no case had more than one minute with sun, and three minutes without it, been required.

Mr. Berry was also of opinion that the restoration of the free nitrate by dipping had some specific effect in the re-formation of the latent image,

which could not be accomplished by mere mixing of the silver with the developer.

Mr. Charles Jones exhibited a very perfect negative by this method; but, not intending to redip, had exposed six minutes.

The Rev. Thomas Banner, during the meeting, developed two stereoscopic plates exposed that day, one of them by re-dipping, the other without. Though both were exposed the same time, that which was re-dipped exhibited every appearance of having been over-exposed; the other was rightly timed, but as it was a very light day the exposure was short in each case.

Mr. Helsby was disposed to think re-dipping exerted some occult influence, for he had tried forcing over-done positives, developed with iron, into negatives, by a further treatment with pyrogallic and acetic acids, but never successfully until he had heard of this; he then brought out rather deeply with iron, washed his plate, cleared with cyanide, and dried thoroughly. After this he dipped it again into the bath, and now upon applying the two acids as before, a very deep, clear, and intense negative came out.

The members separated, after a most satisfactory meeting, at a late hour.

New Books.

On the Invention of Stereoscopic Glasses *for* Single Pictures, *with Preliminary Observations on the Stereoscope, &c.*

By T. Wharton Jones, F.R.S.

(London: John Churchill, New Burlington Street.)

It is not often that we have been more impressed with the truth of the saying, "the wish was father to the thought," than when reading the pamphlet now before us, which is published with the view of showing how a single picture may be forced into producing stereoscopic effects by inspecting it through lenses of peculiar construction, each of which causes a particular kind and amount of distortion.

The fact that Professor Jones, a gentleman intimately connected with investigations relating to the physiology of vision, should have failed to detect the weak point in his own theory, is one of those striking instances of mental obliquity of vision so frequently seen in the enthusiastic pursuer of a cherished idea, who not only ignores difficulties, but also makes light of impossibilities.

The attempt to produce stereosity in one picture may be properly classed with those for effecting perpetual motion, aptly described as getting into a basket and trying to lift yourself up, basket and all, by the handles: it is, and ever must be, simply *impossible.*

In asserting this we do not mean to affirm that a slight *semblance* of stereosity may not be produced under certain circumstances by aid of the lenses contrived by Mr. Jones, if brought to bear upon *skeleton diagrams;* but *true* stereoscopic effect can never by any possibility be educed from a single *picture.* The reason is evident when we reflect that *an object in the foreground eclipses a different portion of those in the background, when viewed by each eye alternately;* and, as in a single picture on a plane surface this condition cannot be fulfilled, the idea of objects in different planes cannot be suggested.

In Professor Jones's remarks upon the stereoscope we find him somewhat behind the age, or surely he would not have written the following:—"Sir David's improvement, admirable as it is, belongs merely to the arrangement by means of which the two perspectives of the slide are presented one to each eye separately. It consists in substituting for the ordinary convex glasses the two halves of one, placed with their circumferential edges next each other."

We need scarcely inform our readers that the "*improvement*" is not now regarded as such, and that in the higher class of instruments whole lenses are as a rule employed; and when, for economy, semi-lenses are still used, they are so placed that the pupils of the eyes look through that portion most nearly approximating to the centre, thus avoiding, or reducing to a minimum, lateral distortion.

We can by no means assent to the correctness of the theory of stereoscopic vision as propounded by the author. We do not see the slightest necessity for any such suppositions as "the mental combination of the two into one." His explanation of the reason why an image though inverted upon the retina is referred correctly to an erect object by the mind, is perfectly clear and sound, it being, as he says, "referred in accordance with the law of visible direction outwardly," and, consequently, the same point being seen simultaneously by both eyes with *an outward reference*, runs no more risk of making a double mental impression than the same point touched simultaneously by both hands.

Again, when treating of the corresponding points of the two retinæ, our author states:—"It is not an indispensable condition of single vision that every part of the impression on the two retinæ be made on exactly corresponding points." We think this statement is scarcely true without limitation, and the illustration given to meet the hypothesis is by no means satisfactory.

A very lucid and perfectly conclusive demonstration of the laws of stereoscopic vision was published a year or two back by Dr. Tyndal, in which that gentleman showed that, as by the degree of convergence of the optic axes the relative distances of various points are accurately conveyed to the mind, while their relative positions are determined by the law of visible direction, all the requisite conditions are strictly fulfilled for ascertaining mathematically the absolute *locus* of each individual point (that in fact a complete system of triangulation is carried out), and that the information is gained by a series of successive but rapid adjustments of the optic axes to each point of importance in the subject before the spectator.

That Mr. Jones is well aware of the power of determining the distance of objects by the two eyes no one could of course for a moment doubt; and this the following extract will prove:—"The faculty of perceiving the three dimensions of space with the two eyes implies the faculty of recognising by the same means the distance and position of objects looked at with the optic axes in a state of convergence." With such a proposition before him, it is to us perfectly marvellous that he does not perceive that in a single picture—however much it may be distorted in opposite directions to each eye, either by reflection or refraction—the amount of distortion of the back and foreground objects in *the same line of vision* being equal, and consequently the convergence of the optic axes in order to view them being also exactly equal, the fact of their being located at an equal distance must of necessity be revealed, and therefore stereoscopic illusion destroyed.

We have admitted a possible case of the *semblance* of stereosity: it is that of a white diagram representing a single object in outline *upon a black ground;* the latter, resembling mere space, would not reveal the fact that the back and foreground objects occupied the same plane.

We readily admit the ingenuity of the plan proposed by Mr. Jones, and can easily understand how he has allowed his enthusiasm to run away with his more sober judgment; but we must bring in a verdict of "not proven," nevertheless.

Letters to a Photographic Friend.

No. V.

My dear Frank,

In my last letter I omitted to tell you what I saw at Solomon's, in Red Lion Square, so take this opportunity of doing so.

You know what an everlasting source of anxiety the focussing glass is to the photographer when *en route*, or in the field, in districts where graziers are more plentiful than glaziers, and opticians are known not, lest, when placed aside on the ground or elsewhere after the operation of focussing has been completed, some accident to it should place him *hors de combat.* To get the focussing glass out of harm's way, Mr. Solomon has introduced the following simple and efficient arrangement in a camera he brought under my notice:—The focussing glass has two springs screwed to the back of the frame, and which rest against bearings in such a way that they force the focussing glass into the position the plate-frame occupies when a picture is being taken. The top of the frame is bevelled, and, if the plate-frame be forced downwards on it, the springs yield, and the focussing glass is forced behind the plate-frame as it slides into position: thus you see the focussing glass need never be withdrawn from the camera, as in the usual method of mounting, so that it saves time as well as risk, and it only entails an additional length behind the groove in which the plate-frame slides equal to *the thickness* of the focussing glass. In the camera examined this was about one inch, but it might be much less. When the plate-frame is removed, the springs, of course, force the focussing glass again into position ready for the next view being adjusted. I only know of one other way of protecting the ground glass when out of use, and that is by providing a compartment for it in the roof of the camera, from which it can be withdrawn, and then, by means of a hinged arrangement, be lowered into position for focussing the view—which done, it is raised and pushed back again; but this can only be accomplished in solid-framed cameras, where a space equal to the size of the focussing frame can be provided in the roof of the camera. But as it is evident bellows and other collapsable forms will, from recent improvements in their construction, come into general use, the method introduced by Mr. Solomon is more generally applicable. Another point in the camera under consideration was, that the plate carriers, instead of being made of wood, were constructed of slate, with silver wire corners for the glasses to rest upon. I think, on the score of cleanliness and absorptive qualities, these slate or "stone-plate carriers" must be better than wooden ones: they are equally neat, but perhaps a trifle heavier. These are made to suit cameras of all sizes.

Another contrivance brought under my notice was a capital plate-cleaning frame. It consisted of a board, to the under side of which a bead was attached, so as to secure a firm rest against a table or bench; the upper side was covered with plush, and, round the left-hand and top side of the board, a beading was screwed that

presented an inner edge somewhat less than the thickness of an ordinary glass plate. At the left-hand corner of the board nearest the operator a wooden bar worked on a screw, so that a glass of *any size* less than that of the board might be clamped by placing it in the right angle formed by the beading, and then pressing the moveable bar against its lower angle. This "lever glass-cleaner" is at once cheap and simple in construction, and greatly facilitates the not over-agreeable operation of plate-cleaning.

In connexion with this contrivance, I was shown the action of "Cowderoy's Diamond Polish"—a liquid for instantly cleansing glass without washing, and said to be free from fixed alkalies, salts, or anything else injurious to the bath solution. This was rubbed over a very dirty plate with a cloth, and the liquid certainly did its work most efficiently.

On starting eastward, the first photographic house that fell in my way was that of Messrs. Burfield and Rouch, at the corner of Norfolk Street, Strand, where I found a very portable camera, conveniently contrived to economise both weight and bulk. It consisted of a base-board, made in two parts, framed and grooved, so as to work like a telescope joint, and which could be extended or contracted, by means of an endless screw. To the widest portion of this board the wooden framework forming the back of the body was screwed, whilst in the narrowest or front portion a piece of mahogany, that carried the flange-plate of the lens, was hinged so that it could be turned up at a right angle to the base-board, and firmly fixed by means of two brass struts, clamped by binding screws. From within the back frame a collapsable conical body, made of thick black plush, was drawn forth, the front portion of

FIG 1

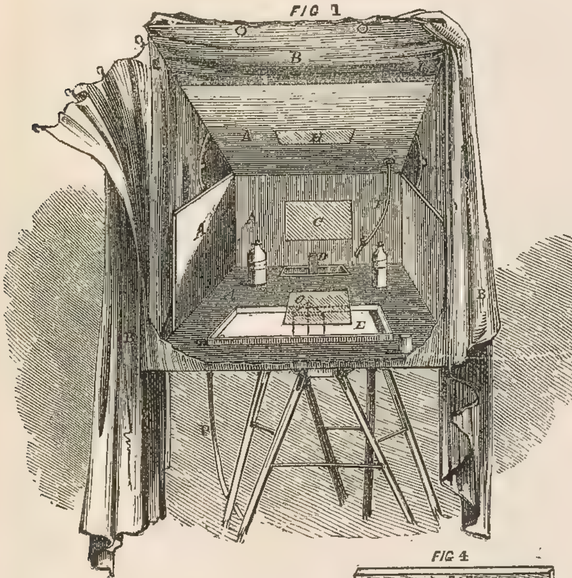


FIG 4

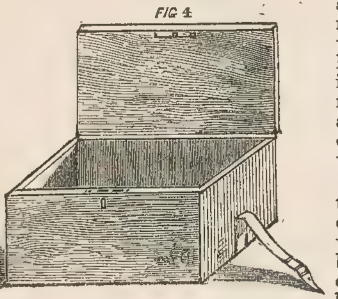


FIG.2

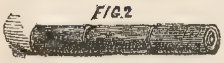
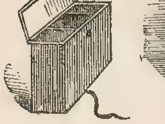


FIG.3



which was attached to a square board, that dropt into a groove in the upright behind the flange-plate. The body received support by means of square iron-wire frames, placed here and there within it, and elastic bands stretched from back to front at the four corners. The focussing was effected from the back, by means of the endless screw acting on the two portions of the base-board; and, when stretched to its full range, this camera was rigid at all points. When the base-board was shut up into the shortest range it corresponded in size with the back frame, and packed into it, closing over the collapsed body, and forming a lid to the whole. The focussing-glass and plate-frame packed within the camera on the opposite side to the base-board, so that all the parts of a ten by eight inches camera packed into a thickness of about four inches. The plate-frame had a cell beneath the plate-carrier, extending the width of the frame, for the purpose of receiving the drainings of silver solution: this seems a good idea.

Messrs. Burfield and Rouch had also a very convenient form of outdoor "portable operating chamber," which, I trust, by aid of pen and pencil, I shall be able to give you a good idea of. *Fig.* 4 represents the chamber when put up as a packing-case; for plates ten by eight inches the dimensions are twenty inches wide, ten inches high, and twelve and a-half inches from back to front: with the covering, &c., this weighs seventeen pounds. This box is screwed on to the tripod-stand, in such a way that the lid forms the front part of the work-table. The front portion in *Fig.* 4 (where the keyhole is inserted) is then pushed up, and kept in a slanting position by means of quadrant-pieces and knee-jointed brass rods, as shown in *Fig.* 1—so as to form the roof of the chamber or tent, which is further extended by means of two stout brass wires and a cross-bar being fitted in to holes in the edge of the lid. Over this wooden portion a covering B, impervious to actinic rays, is fitted, so that a part falls in folds over the back of the operator, and effectually closes out the light from the interior. Yellow light is admitted by means of an orange-glass window C, which slides in grooves, so that it can be used as a shutter to admit white light or air, as may be required. Ventilation may also be obtained when needed by the trapdoor H. The chemicals are packed in a divided tin box, *Fig.* 3, which also acts the part of a reservoir for water, and is then fixed on the top of the chamber, and the liquid conveyed into the interior by means of a flexible tube, closed with a spring clip F. A bag at D receives the bath-holder, whilst a portable tray E and tube P receives and carries off the waste liquids. When the tent is arranged, as in *Fig.* 1, a table space is provided of twenty-one by thirty-four inches, and ample ventilation is secured. It can easily be erected by one person, and adjusted to any height desired. An extra support is given to the tripod on which it is placed by means of metal bars passing from one leg to the other, and clamped fast by screws passing through slots in the metal and this greatly assists in preventing the whole affair being affected by wind. I should certainly expect that one could work with the greatest ease and comfort within its walls.

In passing through Fleet Street, my eye fell upon a carbon filtering apparatus in a shop window. Thinking this invention might be serviceable in the photographic laboratory, I went in to overhaul it. I found that the sponge, or porous stone, &c., usually employed in filtering apparatus, was replaced by a ball of "moulded carbon." This, from its porosity and its known peculiar action on decaying matter, might be expected to give very satisfactory results; and Dr. Hassall states, in his report on these filters, that they deprived foul waters of sulphureted hydrogen, urea, and organic matter held in solution, as well as animalcules, confervæ, and earthy substances held mechanically in suspension, and he regards these as the most valuable and efficient filters yet constructed. These may be had of the Patent Moulded Carbon Company, at prices varying from three shillings to two pounds ten shillings. The most useful form for photographic purposes would be figs. 5 and 6 in their list, and costing ten shillings for one of a capacity of one gallon, twenty shillings for one of three gallons, and thirty-five shillings for one of six gallons.

Another form consisted of a carbon ball, to which a flexible tube was attached. On placing this in a vessel of water of questionable purity, and sucking the free end of the tube till water was drawn up, and then dropping the end lower than the ball, it began to act as a syphon, and the water was drawn over bright, tasteless, and apparently pure. This form would be very convenient for use when travelling, as the ball with its tube occupies little space, and can be readily applied to any vessel when needed. Dr. Hassall states that these carbon filters act not only mechanically, but chemically, and have the power of abstracting a large portion of many substances held in a state of absolute solution, as in the case of acetate of lead. A solution of sugar, having a specific gravity of 1012, after filtration was reduced to 1004.

The next photographic house on my route was Shepherd and Co.'s, at the corner of Farringdon Street. Here I found a camera, in principle exactly like that I had examined at Messrs. Burfield and Rouch's, the plan of which had been placed in Mr. Eidman's hands by Mr. Ramsden, of collodion celebrity—the only point of difference being that the end of the conical body was permanently attached to the flange plate, and this was fixed in position at the end of the telescopic base-board by means of a triangular bar fitting into an aperture of corresponding shape, which could be fixed at any height by a clamping screw. This also allowed of the lens being adjusted for foreground, and the body was made of waterproof cloth, instead of plush, as in Messrs. Burfield and Rouch's instrument.

I also took the opportunity of examining "Jeffery's Excelsior Dark Tent." The frame of this is put together so that it folds up like the letter W, the inner folds of which when pressed down form the table portion of the tent, and the outer limbs are kept at right angles to the table by means of another hinged frame that fits on in front. This framework is clamped on to a stand, and over it is stretched a black twill cover, with a yellow window let into the front portion. To the upper part of the side frames are fitted a contrivance for ventilating the tent. When folded this roomy tent occupies the space of a large carpet-bag. There is one peculiarity about this arrangement that I must not omit to call your attention to—viz., that a provision is made for fixing the lens in the front of the tent, a little above the table; whilst behind the lens, attached to the table, is a sliding board, carrying a hinged plate-frame, turning up at a right angle to the table, so that the tent may be employed as a camera as well as an operating room. To a *travelling portraitist* this arrangement would be valuable, as the lens could readily be pointed at a chair on which the sitters would always take their place. But for landscape photography such a method would be *very* inconvenient, as I know from experience; for, some years since, I contrived a framed tent, with a camera attached, so that it could be manipulated from within. This tent was mounted on an axletree carrying a pair of large light wheels; but, although this possessed more freedom of motion than a tripod-stand admits of when pointing at fresh views, it was too cumbersome to allow of its being placed in many positions, and the covering of the tent catching the wind imparted a very undesirable tremor to the lens and plate. There is little question but that the camera and tent should be kept distinct, except for the purpose I have previously indicated, and then it can be placed in a position so as to be shielded from the wind.

This letter has now run to such a length that I must wait till I can again find leisure to inform you what I saw at the other establishments in Rowland Hill's E. C. district.

So believe me,

Yours everlastingly,

SIMEON HEADSMAN.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

Returning to the face, hatch a thin pale tint of blue (cobalt) over the receding or rounded portions of the face, and about the jaws; soften the outlines of all shadows, keeping the edges cool and grey; destroy all hardness in the lines of the eyes, mouth, hair, ear, &c., and continue working upon the flesh until, in point of roundness, gradation, softness, and fidelity of resemblance to nature, your eye is tolerably satisfied. Then work up every other part with a similar feeling and result, with extreme care, tenderly preserving the more subtle transitions from light to shade. If you are colouring on the salted paper, the application of the burnisher, as already described, will be frequently necessary, during progress, to keep the surface hard and smooth.

You will discover frequently that while in the light in which it was painted your picture looks soft, smooth, and even, in the reverse light it will appear coarse and rough: to avoid which effect, in the course of your work turn the picture upside down now and then, and even up the colours with very tender, delicate touches, taking great care not to deepen the colours too much by working into the interstices. Preserve the proper proportions of depth or tone with the greatest care.

The instructions given relate to painting a fair complexion: for a darker one use, for the flesh-wash, Venetian red and Indian yellow, keeping the shadows and half-tints greenish if the complexion incline to the sallow, or purplish if the complexion possess more of the red hues; or, if the complexion be very dark, use a little burnt sienna or yellow ochre in the flesh-wash. [See previous remarks upon the half-tints and shadows of flesh, and also the "maxims."] It would be so difficult, without models, to convey any idea of all the many modifications of colours and tints necessary for imitating the vast variety of complexions, that these few hints, with the many others already given, must suffice. With study and practice the student will duly learn to secure all the effects of nature; and without such aids what I have said already is more than enough for his guidance.

TINTING.

A less elaborate method of colouring, which will demand less time and study to secure a pleasing effect, may be adopted as follows:—

Commence by working over the retiring shadows and half-tones with washy touches of cobalt, mixed with a very little Naples yellow, making this tint more or less blue according to the character of your sitter's complexion. Then work over the deeper shadows with a little Indian red, combined with a very slight touch of vermilion. Now take a little pink madder and put the colour into the cheek, lips, &c. When these colours are dry, carry over the whole, with a light touch and a rather full brush, a general wash of Naples yellow and pink madder, or Venetian red and Indian yellow, with a touch or two of Chinese white, or madder pink and Indian yellow, or what other mixture may seem best for producing the complexion to be imitated, keeping the colour clean and bright, and not too deep in tone. Whilst this is drying, a wash of any of the colours for hair which have been already given may be applied, but be careful not to use it too fluid, lest it should stray into the flesh tints and destroy their purity and beauty. The eyebrows and lashes may next be touched in with a little sepia, or sepia, lake, and indigo mixed to a rich purplish or blueish black, preserving their softness and delicacy with the greatest care. With this last tint touch in, vigorously, the pupil of the eye, and outline the iris of the same with a little indigo or sepia: the former if the eye be blue or grey. A little vermilion and madder pink, or madder pink or lake, as the model will determine, may be stippled over the lips; and a little brown madder and pink used to strengthen the deeper portions of the shadows, used with a little gum water. With a delicate stipple now proceed to even up or deepen the tints, adding a little cobalt to the greys, a little cobalt and madder pink here and there [see previous directions with reference to the violet and blue tints in the flesh], and a little Indian red to warm out the deeper shadows. Tinted pictures are generally left with the flesh only coloured.

ORNAMENTS, DRAPERY, ETC.

Gold.—Lay in with Roman ochre; for the shadows, use a little bistre and burnt sienna; for the high lights, a little yellow ochre and white, with a touch of cadmium; the highest or more sparkling high lights, with a little cadmium and white;* reflected lights, orange chrome.

Silver.—Local colour, black, white, and burnt sienna; shadows, cobalt, sepia, and madder pink; high lights, pure white; reflected lights, Naples yellow.

Pearls.—Local tint, ultramarine, sepia, and lake; burnt sienna and ultramarine for shadows; ochre and white for reflected lights; high lights, pure white.

Lace.—It is as well to paint this over the colour it is supposed to cover, this colour being painted as if in shadow. The local colour for lace is a yellowish white, upon this place the lights with white. Use sepia with a touch of cobalt for the shades.

Feathers.—Say the feathers are white: use for the local colour ultramarine, ochre, and madder pink; the same, deeper, for the shades; and pure white for the high lights. Carefully avoid harsh touches in laying on the lights, working with a series of faint and tender touches to preserve an appearance of feathery softness and looseness in the particles. For the stronger shadows and markings use a little warm sepia.

Velvets.—Black velvet: local colour black, with a little gum; lights white, lampblack, and a touch of French blue; shadows, lake, sepia, and indigo, with gum; highest lights, white, black, and a touch of blue, using more white. Put in the fainter reflected lights with the colour for the lights, but glaze over them, when dry, a little madder brown and gamboge. Keep all the lights soft, but strong. For green velvet use prussian blue, cadmium, and Venetian red as the local tint, laid on with a good body; use white, Prussian blue, and a little gamboge for the lights; white and French blue for the highest or brightest high lights; and glaze over

* Increased brilliancy of the highest lights may be obtained by laying the white on first, and, when dry, glazing it with a little gamboge.

the whole with sap green. Crimson velvet: lake and madder brown for the local colour, laid on with a good body; shades, lake and sepia; high lights, white and a little vermilion; glaze with carmine. [For a more detailed description of the method of treating velvets refer back].

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

J. B. and Rosalind.—The replies to these correspondents being of a character not likely to benefit or interest others, will be sent per post as soon as the author has made the inquiries.

Arthur E., Colchester.—The old old fault—impatience. Don't hurry, I say again. I really cannot judge from the specimen you sent—try again.

Chromo.—I have been from town, but will write to you in a day or two.

An Unanswered Inquirer.—I must solicit your pardon for overlooking your note. I should not suppose that Chinese pigments possess any absolute superiority to our own, but they are certainly more elaborately ground, and altogether better prepared. I should have thought your plan a good one; however, try a varnish made with equal quantities of Canada balsam and clear white resin, dissolved in turpentine. With reference to your last question I have consulted Sir Charles Eastlake's work, and find that the varnish so highly recommended for oil paintings, as retaining its purity of colour and transparency better than any other, is composed of the best Olio d'Abezzo, slowly dissolved with gentle heat, to which is added rectified petroleum, the whole being well stirred while mixing. It is applied, while warm, to a surface also warmed. The painting may be warmed by the sun, or, with more care, by the fire.

Foreign Correspondence.

Paris, September 10, 1860.

A fortnight ago I left Paris for Tréport, with the intention of taking some sea baths. To tell the truth, although my enfeebled health required that invigorating treatment, I counted but little upon the effect of baths, which the season's persistent inclemency would necessarily render unfrequent. I founded more serious hopes upon the purity and freshness of the air, upon the bodily repose, and upon the setting free of the mind from its habitual occupations, and from those ideas which, besetting it at the same hours day after day, finish by wearying the brain. I was like one of your city merchants who, after the labours and all-absorbing preoccupations of the week, quits his office on Saturday, bidding business good-bye till the Monday morning. I penitently confess to having thought, with a certain pleasure, that for some few days I should hear no more of collodion, nitrate of silver, hyposulphite, camera, and stereoscope.

Tréport is a charming little port, seated at the foot of a cliff in our fertile Normandy—a town inhabited by two or three thousand fisherfolk, and visited in the bathing season by a few modest families, for whose tastes or purse the luxury of Dieppe and Boulogne would be ill suited. I had, therefore, much chance of finding there a calm which would be beneficial to body and mind, and I started in all confidence. The first person, however, that I saw on getting down from the carriage was a gentleman carrying a photographic apparatus, and whose costume and white hands led me to judge him an amateur. The next morning, at the entrance to the jetty, where I had gone at sunrise to enjoy the fine spectacle presented by the sea at that early hour, I found a camera with its objective pointed at the port, and seeming to bar my way. This time there were two operators, and their mode of proceeding showed them to be professional photographers. The day following, I met two others coming in from the environs with their baggage. It was enough to make one believe that all the photographers of the country had fixed, for their common rendezvous, upon this little out-of-the-way corner of France. But I was still more surprised when, on returning from an excursion into the country, I found in the very middle of the quay a booth, which seemed to have grown there by enchantment, and which was no other than the extemporised operating-room of one of those nomadic photographers of whom I spoke in a previous letter. Already the portraits of the best known bathing-men of the place were exposed to public view, together with the figures of a few soldiers picked up on the road, and a dozen or so of half-obliterated stereoscopic views. As I passed, a baby, mounted on a donkey, was having his likeness taken in the interior, the door being left open to excite the curiosity of the wondering natives; and, while the *artist* and his assistant were operating, two women were seated at a table, busy with needlework. When I left Tréport two days ago, the little tribe had not yet struck their tent; without doubt, business was going on prosperously. I know not whether the wandering disciple of Daguerre took many portraits; but I know that there was one which must have paid him well, for copies of it were in great demand. It was that of the chief of the master-bathers—a handsome fellow, with curly hair and light-coloured beard, whose lessons and protecting care were much sought after by the numerous and elegant *baigneuses.* Thus has photography invaded the whole land; and there is now-a-days no nook so obscure as to be without a rambling portrait-taker.

As I have confessed to you my selfish disappointment at finding in my retreat that which, on leaving Paris, I had wished to fly from for a few days, I must also avow that I was led to regret that there was not about me a still larger number of photographers, whether amateurs or professionals. It was on the 20th of August, for which day had been announced a solemn procession to the summit of the cliff, which, from its three hundred feet, looks down upon the little town, the surrounding country, and the outstretching sea. The object of the ceremony was the erection of a colossal cross, supporting an image of the Saviour two yards in height, which might be seen by the fishermen of the country in their little voyages, which rarely extend to more than three or four leagues from the coast. After a religious service at the Church of Tréport the procession set out. The little girls of the place, clothed in white, and bearing little blue banners, went first, led by Sisters of Charity; then came seamen bearing tapers, and then twelve master boatmen, who bore on a litter the image of Christ, in cast-iron, weighing more than four hundred pounds—a heavy burden for such a road. After them went the clergy of Tréport, whose numbers were swelled by all the *curés* and *vicaires* of the neighbouring localities, and then the numerous and peaceful crowd. They formed a striking spectacle as they slowly climbed up the steep and verdant slope of the cliff, and seemed as it were suspended 'twixt heaven and earth. When the summit had been reached, and the image of Christ, so laboriously brought up those heights, had been fastened to the cross, the appointed preacher, from that magnificent natural pulpit, amid the deepest silence, addressed an animated discourse to the multitude around him, who had quitted their homes in the adjacent villages to be present at the ceremony. The splendour of the place, from which could be scanned an immense horizon—the very simplicity of the scene, bringing to mind the primitive Christian days—together formed an admirable picture, which, in the open air, and with the motionless and attentive crowd, it would have been easy to seize; but unfortunately there was no photographer there to reproduce it.

On my return to Paris, I found but a few communications respecting the eclipse of the 18th of July. These show that in all parts photography was largely turned to account on that occasion; and the results reported prove that the art is now become an indispensable auxiliary to astronomy. ERNEST LACAN.

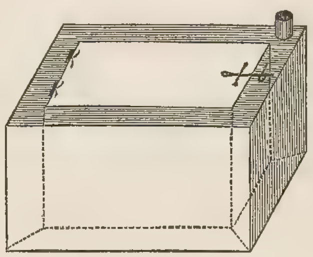
Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

DRYING BOX.

To the Editor.

Sir,—I enclose a rough model of what I call the "Photographic Water Oven."



About two years ago it occurred to me that such a thing would be very useful to those who wrought the dry-plate process, and I applied to a photographic friend, who was a better draughtsman than I am, to make me a sketch of it, so that I might send it for insertion in your useful Journal; but he said that although it was good yet no one would go to the expense of getting one, so in consequence of that I did no more in the matter, although I have often thought it a pity such a thing was not adopted.

I think you will nearly understand by the model what the "oven" is like. If you fold up the inside part first, and stick the gum paper where you will see it should go, you will observe that it forms a box. Then fold the outside part, and it forms a box outside the other, with a space between for the *water*. The whole to be made of tin or brass. Of course, the inside box will have to be supported from the bottom of the outside one; on the top at the corner is the hole for putting the water in; and in the centre of the top there may be another hole, made with a conical rise, on which may be slipped a *worm*, and then would be got *pure* distilled water;—although it might not be much, still it could be depended on for particular work. The front and sides ought to project about an inch below the bottom to keep the smoke from the gas or lamp from coming up that way; and what will be an improvement on my plan will be to put ledges on the sides, such as Shepherd and Co. have on their little apparatus for plates that do not require to be kept so free from dust. The whole can be made to hang on the operating-room wall like a German clock, so that a gas branch can be turned in beneath it at pleasure, and one can receive light from it at the same time that it heats the water.

Now, sir, if you think the above worthy of a place in your Journal, and you will take the trouble to insert it, I shall feel happy in making a small return for the many hints I have received from others through the medium of the Journal, &c. It was by seeing how you appreciated Messrs. Shepherd and Co.'s plan that I thought perhaps some photographers might think more of my contrivance than my photographic friend above referred to.—I am, yours, &c.,

WM. BIRNIE.

ENLARGING.

To the Editor.

Sir,—Supposing a portrait taken with a half-plate lens were enlarged in the printing by means of a solar camera to what is called full-plate size, would there be any difference as to sharpness between that and one taken with a full-plate lens, and printed in the ordinary way? And would it take any longer to print in the solar camera than the ordinary one?

As I wish to take larger portraits, and have only a half-plate lens (Ross's), I wish to know, and shall feel obliged by an answer through your Journal.—I am, yours, &c.,

Aug. 28, 1860. A LADY PHOTOGRAPHER.

[Your note reached us too late for reply in our last. We perceive that you have also made the same inquiry of a contemporary; and though we have no wish to cause you any embarrassment, *our* reply you will find *diametrically opposed* to that you have already received.

It is impossible to enlarge a negative without some loss of definition, be it much or little; and we consider money spent on the solar camera just so much waste. For details of the subject we refer to our last volume, pp. 236, 253, &c.

You will obtain better results by taking a small negative and enlarging therefrom to some extent, than from a larger negative with more moderate increase of dimensions (at least that is our experience); but there is certainly more labour incurred by enlarging than by taking full size direct.—Ed.]

FAULTY PAPER.—PETSCHLER AND MANN'S DRY PROCESS.

To the Editor.

Sir,—I beg to return you my most sincere thanks for your replies to my former queries. I was not able to attend Mr. Hardwich's classes, as I had not time to remain sufficiently long in London. I have, however, been since trying what I could do without aid, and I think I have succeeded pretty fairly.

I have met with a difficulty which I cannot explain. The enclosed will show you what it is. The two stereographs I send you are on paper made by different makers. The red-toned one is made by Rive, and the other one by some Scotch maker—I forget his name. Both papers, however, print very well in the printing frame. Perhaps you will be kind enough to say which is the proper tone, and make any remarks on them, or on the negative from which they were printed, that you may think proper. I have been trying the modification of Taupenot's process, as described in your Journal of the 16th August. I have met with the greatest success. I have not given the plates sufficient time to know how long they will keep; but I do not see any reason to prevent them "keeping" to any extent of time. I shall be happy to forward you a correct copy of this village—I mean a stereo-print—if you think it worth your acceptance.—I am, yours, &c., A NOVICE.

[Your success is certainly very satisfactory, and gives promise of your becoming a good photographer. The specimens of paper are very faulty, being full of metallic spots. We recommend you to apply to Mr. Hughes, of Oxford Street, for some that he knows to be good. You must be careful, in sensitising your paper, that the surface of the silver solution is free from floating particles, otherwise they will produce little specks on the proof. The specks on the specimens you have sent, however, clearly arise from minute grains of some metallic substance in the pulp of the paper, as you may readily perceive on examination under the microscope. The reddish-toned print is not unpleasing for some subjects, but too warm for general purposes; the other is a little too grey, but not bad. The fault lies in the paper, which has too little chloride in it to enable you to get a vigorous print. We have very little fault to find with the negative: a rather longer exposure would have improved the foliage without spoiling the rest. Remember you should expose with reference to your *shadows*. You need have no fear of the "keeping" qualities of the plates. We shall be happy to receive the proffered print of "our village"—Ed.]

☞ **The Publisher, in reply to continual inquiries, begs to inform present or intending Subscribers to this JOURNAL that no difficulty exists to prevent its being received on the respective days of publication (viz., the 1st and 15th of each month) in any part of Great Britain and Ireland. It is printed in sufficient time to be despatched by the Publisher, Liverpool, or by the London Wholesale Agents, so as to reach the most distant Subscribers and Agents on the above days. Orders sent direct to the Publisher, accompanied by a remittance (if by post-office order, made payable to Henry Greenwood, 32, Castle Street, Liverpool), or to the London Wholesale Agents, Messrs. E. Marlborough and Co., 4, Ave Maria Lane, E.C., will receive immediate attention. Foreign Subscribers and Agents can also be supplied in the same manner by paying the additional postage charged by the Post Office. Orders given through Country Booksellers are carefully executed by Messrs. Marlborough and Co., as above, or by the Publisher, Liverpool.**

ANSWERS TO CORRESPONDENTS.

E. R.—You may do so with safety in the quarter indicated.

An Intending Amateur.—Mr. Thomas Ross, Featherstone Buildings, High Holborn.

J. F. R.—We cannot recommend you to purchase the apparatus you mention: it is, in our judgment, a mere toy.

Queechy.—The American views that you speak of are mostly very good; a few of them but indifferent, but only a few.

Scotus.—It is a delicate question to answer truthfully, yet inoffensively. We can safely say, "bide a wee bit," and you will be no loser.

Chas. Cooly.—We believe the quondam replies, relative to the class of pictures named, to have been all "bosh." We do not believe a word of it.

Anxious Artist.—We think, from their aspect, that they must be by Wilson, of Aberdeen; but we have only seen them in passing the establishment you name.

F. C.—1. Needless in the Fothergill process, but no disadvantage. 2. The process named is, in our opinion, a mistake. We recommend you to try Petschler's process.

One of Many.—It would be impossible for us to do as you wish, even if we were inclined. We only criticise such as are sent to us for that purpose. It would scarcely be fair, even if practicable, to do so unsolicited.

Wenham.—If the water be not clear, there is still a portion of chloride *in suspension*, and you lose a portion of the silver by throwing it away. Probably boiling the water in an earthenware vessel will cause precipitation to take place.

J. S. (Oxford).—You have omitted to add a few drops of solution of nitrate of silver to your developer. This is a *sine quâ non* for dry plates. Wet ones have already enough to form the picture, but on dry plates there is little or none left.

S. E. C.—We do not apprehend that there is any occasion to fear the light of a fire in the developing room. A *very* brilliant blaze might possibly affect a *very* sensitive plate, if held too near it; but that is a contingency not likely to arise.

Faulty Negative.—We do not perceive any reason why you should not paint out the blemishes from your negative: there is no fraud unless you attempt to conceal it. When you send in your picture, you can say "touched negative."

Goose.—Perhaps "some one else" might designate you by the name of another web-footed bird instead. Is that the reason why you make so bad a sitter? Just fancy *yourself* criticising *yourself* in the looking-glass, and then you will do very well.

Adolphus.—The first on your list of names decidedly. The last mentioned is very good for the price, but it is a "Jerusalem pony" to a racer as compared with the other. The gas stove will do very well, provided that you carry off the vitiated air by a tube into the chimney.

Jessie.—You had better begin by learning to print well: beg, borrow, or "otherwise acquire," a good negative to operate with, and carefully note the instructions for printing. By a little practice you will learn more of photography generally than by any other course of proceeding.

Erc.—Nos. 4 and 7 we have not seen; but the other five we have minutely examined, and find that each has some peculiar advantage for certain purposes. For our own use, when moving about from place to place, we should prefer No. 5 on your list. No. 1 is very good and roomy, but is heavy, and takes some time to put up, so that it is not so well adapted for *constant* change of place.

Samuel Evershed.—We can most certainly recommend the article about which you inquire. We have no influence in the commercial phase of photography, and, therefore, cannot help you to obtain the advantage mentioned. We are a little amused at your extra faith in our opinion "because you are a personal friend of our publishers'," who are gentlemen that we have never to our knowledge even seen, or had any direct communication with, as we have nothing to do with the "business" of the Journal.

J. S. Borwick.—We believe that the composition you mention is to be purchased, and that the artist resides at 168, New Bond Street. Collodion iodised with a cadmium salt will keep for a very considerable space of time without deterioration; most other kinds change more or less for the worse in a few weeks (sometimes days), gradually becoming more and more highly coloured. A partial restoration is effected by immersing therein a slip of pure silver or cadmium. Never *throw away* collodion: when utterly spoiled for any other purpose, it is capital for cleaning glass plates that have been previously used.

No Chemist.—Your developers will do very well. You are mistaken in supposing that no intensification occurs; the fact of your negative *turning red* proves that it does. To satisfy yourself proceed as you have been doing, only *intensify one-half* the plate, leaving the other half as it was after development with the iron solution; then print from the plate, and you will soon perceive the difference. You should fix with hyposulphite of soda, as the greater intensity produced by the organic matter of the pyrogallic developer is nearly destroyed by the use of cyanide of potassium as a fixing agent. A little dilute albumen (a few drops) added to your pyrogallic solution, when intensifying, will very materially increase the effect.

A. H. J.—1. You err in supposing that you should have *exactly* the same portion of the view in both halves of your stereograph. You may correctly take a quarter of an inch more on each side of the pencil lines that you have drawn, which will make half an inch difference in the whole. The reason for this is that you are to suppose you are regarding the subject *through* a rectangular aperture—a window, for instance, in which case (as you may demonstrate by trial) you will find, on closing each eye alternately, that the right eye sees a little more of the left side, and the left eye a little more of the right side of your subject. Your lenses are, however, rather too close together, and might be separated another half-inch apart, with advantage. Get your brass plate cut through between the lenses, and you can then separate them.—2. Add one grain of bromide of cadmium to your collodion, and you will find that the greens will come out better, but your exposure must be longer. The snowy effect is apt to arise *not* from *over exposure*, but under exposure and over development.—3. Good.—Cadmium.

⁂ "Government in Competition with Professional Photographers," No. II, with other articles, have been deferred from want of space.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 127, Vol. VII.—OCTOBER 1, 1860.

We verily believe that it would be quite worth the while of some of the larger enterprising railway companies, which endeavour to coax the money out of the pockets of a certain section of the public by offering what are designated as *tourists' tickets* at reduced rates, to establish in the waiting rooms some of those cleverly-constructed PEDESTAL STEREOSCOPES that are furnished with an almost unlimited number of stereoscopic slides, which can each be brought into view in succession by turning a small knob, the mechanism acting upon a similar principle to that of the Jacquard loom. Of course the object would be to exhibit stereoscopic views of the various interesting localities accessible by the line. This is a scheme which we have little doubt might be readily made to pay; for the probability is, that the railway companies might obtain the stereographs without charge for the consideration of the perperpetual advertisement thus afforded to the photographer producing the stereographs, who would of course stipulate for the privilege of appending conspicuously his own name and address. As there are few people now in such an uncivilised state as not to possess a stereoscope, while nearly all like to take away some record of the places associated in their memories with holiday trips and all sorts of pleasant reminiscences, the photographers would find their account, not only in bringing people to their own localities, but also in putting their goods before them in a prominent and memorable manner. We certainly started the idea half in joke; but, in sober seriousness, we do think it is one that might very profitably be carried out.

Of course it is to be expected that, in viewing a stereograph of a locality that has been visited by the spectator, he will most probably recognise it with readiness; and this is a pleasure that we have on many occasions experienced when criticising specimens that have been forwarded to us for the purpose. But we have recently also experienced the converse of this in a visit to Dovedale, in Derbyshire, where, though unaccompanied by any one acquainted with the spot, we were enabled to recognise with facility most of the remarkable points of interest along that very beautiful valley, simply from being familiar with Mr. Woodward's illustrations of them—a detailed notice of which appeared in these columns some time since. There are also many other places with which, not having visited, we are yet intimately acquainted, and have no moral doubt that we should be quite at home in; for have we not been introduced to them by Wilson, Rodger, Sedgfield, Ogle, and many others? Truly this same stereoscopic rendering of the many favourite haunts of pleasure seekers is one of the *institutions* of the present day, and a very pleasant one it is.

We find photographers are very strongly inclined to try whether it may not be possible to return with advantage to paper as a vehicle for negatives; but we regret to notice that with many of them, instead of attempting to substitute paper for glass, they are endeavouring to reduce the calotype process to its simplest expression. Although this may prove an advantage in one respect, we cannot be otherwise than conscious that, while the paper itself is made the recipient of the sensitive substances, all the evils that have led to the abandonment of paper for negatives cannot fail to be re-introduced, *e.g.*, granulation, absence of sufficient definition, spots from flaws in the fabric itself, &c.

One very curious circumstance has occurred in connexion with this subject. In the respective numbers of two of our contemporaries, which appeared on the same day as our last, we find a simplified calotype process, almost identical in all particulars, put forth both by Mr. Prichard, of Leamington, and Mr. Sutton, of Jersey—though the latter, by the way, does not admit that it is a calotype process at all: in this we think he errs, as the principle involved is precisely the same, the mere details of manipulation alone differing. In stating this, we are by no means decrying the improvement in the preparation of the paper—for such it is; but simply protesting against any possible improvement, where the image is in the paper, being sufficient to cause the abandonment of glass as a support to the sensitive film. We do not suppose that there has been any direct communication between the gentlemen named upon the subject in question; for, though their operations are very closely alike, there is a sufficient variation both of quantities and method of application to show that it is simply another case of experiments in parallel directions. The object of both is to prepare a sensitive calotype paper by continuous operations, instead of, as formerly, obtaining first a coating of so-called insensitive iodide of silver, and subsequently rendering it sensitive by the application of aceto-nitrate of silver a short time before exposure. We have no doubt that the plan proposed is a considerable saving of trouble, and that the results are at least equally good; but, for those photographers who are content with calotype negatives, we would suggest the trial of a further slight modification, whereby valuable time might be saved in getting a few sheets ready for the camera, especially when away from home. Our idea is to endeavour to take greater advantage of Mr. Petschler's principle than has yet been done in its application to paper, and proceed as follows:—

Coat the paper on both sides with a measured quantity of solution of an alkaline iodide, the application of which may be either by means of a very shallow glass dish, as advised by Mr. Sutton, or by the glass rod, as directed by Mr. Prichard. In either case the object is to apply a given dose, neither more or less, to the sheet of paper. As regards the strength of the solution, we incline more towards Mr. Sutton's, namely, thirty grains to the ounce of water, than to Mr. Prichard's, who only directs six grains; but probably somewhere between the two would be best—say twenty grains. After soaking for a few minutes, the paper to be pressed between blotting-paper, and while still damp treated on both sides with a measured quantity of aceto-nitrate of silver, of say thirty grains of nitrate of silver to the ounce of water, with from ten to twenty minims of acetic acid, according to weather, &c. The paper is again pressed

between blotting-paper; and thus far we have proceeded precisely as suggested by both operators, who then wash the paper in water, to remove superfluous nitrate of silver, and then put it in the dark slide ready for exposure. But if, instead of plain water, we substitute a weak solution of chloride of ammonium, or similar substance—say one grain to the ounce of water—we could then dry our paper, which ought to be insensitive to light, or nearly so, but which could be readily rendered fit for exposure by merely soaking in water just before being required to be placed in the dark frame, which might be done, as in the cases suggested, while still wet. Of course, this would be nothing more or less than the application of Mr. Petschler's principle to the calotype process. We have not tried the experiment proposed: want of time quite precludes our so doing at present; but we throw out the hint for the benefit of those whom it may concern.

It is with sincere regret that we have to record the decease of one of our veteran photographers, in the person of Mr. Peter W. Fry, until very lately a member of the Council of the Photographic Society, and one of its original promoters. He was formerly a member of the Photographic Club, and one of the earliest followers of the calotype process; and we have, on several occasions, listened to his amusing account of the very primitive and awkward kind of camera with which the earlier photographers had to be content. He was very active in introducing Mr. Archer's discovery of the collodion process, and materially assisted that gentleman in bringing it to the needful state of perfection. We cannot forbear relating an anecdote, which we had from his own lips, of an incident that happened to him, and which caused him no little feeling of embarrassment. Being in Italy, with some members of his family, he had taken a photographic copy of a work of art with which he was struck, and subsequently noticed a student (a foreigner) who was employed for several consecutive days in copying the same subject by hand. Thinking that a copy of the photograph might be of service to the poor student, he, with his usual kindness of heart, printed one for him, and made the offering to him while he was at work on the following morning. The student received the gift with many thanks, inspected it carefully, comparing it with the original: he looked at his own work with evident disgust afterwards, and, snatching it from the easel, *he dashed it violently across his knee, thus rending it into tatters*, and destroying in one instant a week's work. Mr. Fry used to declare that he never remembered to have felt more awkward than upon that occasion.

Mr. Fry's loss will be deplored by a large circle of friends, including many both in the artistic and scientific *coteries*. He was a pleasant companion, a kind-hearted friend, and a most enthusiastic photographer.

OBSERVATIONS ON ALBUMENISED PAPER AND ALKALINE GOLD TONING.

By C. Jabez Hughes.

No. II.

The Plain Paper.—In the former article I endeavoured to show that albumenised prints depended for their character and tone mainly upon the original plain paper. I pointed out that, although there are English, French, and German papers at command, the two latter are principally used, and I promised to discuss in detail their particulars. In resuming, I wish it to be understood that my remarks apply only to their fitness for albumen prints.

Plain paper may be spoken of as composed of two distinct substances, *pulp* and *size*. The pulp—chemically speaking *cellulose*—when examined under the microscope is seen to be a mass of fibres interlacing in every direction. In this form—blotting-paper is a good example—from its soft, spongy, absorbent nature, it is obviously unfitted for printing upon; but when the "sizing" is added, binding together and cementing this loose vegetable felt, the material then properly becomes paper. If this distinction be borne in mind, that paper is formed of "pulp" and "size," and that each of these is subject to defects, its nature can be more readily examined, for it may happen that a given paper may be good in one respect and bad in another.

The "pulp" is derived in all countries from the same sources—cotton and linen rags—and it probably does not vary much in its nature. I do not conceive it plays any important part in forming the photographic image. I consider it acts only mechanically as supporting the albumen film, and retaining the sensitive solutions within its fibres.

The "sizing," however, performs a chemical as well as a mechanical part; for not only does it cement the fibres together, but it unites with the silver and gold salts, and materially determines the nature of the picture obtained.

Although the paper makers of England, France, and Germany, are fully agreed that linen and cotton rags are the right materials for the "pulp," they are by no means unanimous as to the proper composition of the "sizing." In our own country gelatine is used; in Germany, starch; while the French are supposed to employ a mixture of starch and resin; but it really is not exactly known what is used, for the manufacturers do not allow their trade mysteries to be penetrated. It is sufficient that, while there is not much difference in the pulp, the sizings vary very much indeed, and communicate their character to the paper.

In judging of the pulp the paper must be examined by holding it to the light and looking through: a good paper will show a uniform texture, with very few spots and irregularities. Estimated in this manner, the English papers are generally very good, their principal faults being iron spots; the German or Saxe papers are also very good, scarcely so uniform in their texture as the English, having a mottled appearance, which, however, never shows in printing; while the French papers, especially those known as "Rive," are found to be extremely defective. The whole paper has more or less a honeycombed, speckled appearance, numerous holes, and no end of transparent and opaque spots. Canson used to make paper comparatively free from these faults; but he does not now, his new make being about the very worst in use. A great number of the defects seen in these Rive papers, however, do not show in printing, but then a great many do; and any photographer who uses this paper must be very lenient and patient, for there is no possibility of obtaining it without these objectionable peculiarities.

Perhaps this will be the proper place to correct a very prevalent error among photographers, who imagine that "Rive" is the name of a maker of paper like Canson. The fact is, Rive is the name of a small town in France, where, water-power being abundant, there are a few paper mills, the largest of which is "Blanchet, Frères and Kleber's." These makers sometimes have their initials in the water-mark, "B. F. K." In one batch the word "Rive" will also be there, in the next absent. Sometimes only the word "Rive" will be found, and occasionally only a few sheets in a ream have any water-mark. I mention this in explanation, for I have known photographers declare the paper to be entirely different, though coming from the same mill, because the customary water-mark was absent. "Rive" means therefore, like "Saxe," not a maker's name, but a small district producing paper of a particular character.

In the French papers the "size" employed, whatever it be, gives them an extraordinary hardness. The fibres are cemented together very closely, so that the surface is very hard and fine. When this paper is laid on albumen it seems of a repellent nature, is inclined to curl, and finally, when taken off and dried, retains the albumen almost entirely on the surface, giving the highest glaze of any papers. Those persons who wish the very highest gloss must always ask for Rive, for no other paper can be had, all other things being equal, which so readily takes the highest gloss; but they must remember that there exists a greater quantity of spots and marks, as already mentioned.

In the German or Saxe paper the sizing is not nearly so hard as in the Rive. The surface therefore is not so fine, and, when albumenised, the albumen seems to sink into the paper. It never receives so high a gloss as the Rive. On the other hand, those defects so common in Rive are almost absent in the Saxe. The greatest care appears to be taken in the preparation of the pulp, and very few defects are to be found in it.

Judged by the standard of the other two papers, the English sizing seems very indifferent. The surface of the paper is never so fine as the French, and seldom quite so good as the German. The albumen sinks into it more even than in the German, and when immersed in the solutions this paper more than any other gets woolly and soft, thickens, and becomes porous. The peculiarities

spoken of are quite independent of the hot pressing or glazing, and is entirely due to the sizing.

The above papers all act differently in toning. The English ones print red in the pressure frame, and tone very reluctantly, adhering very much to some shade of reddish brown. They can be got to deeper colours, but not so easily. The Saxe papers print a dark colour, and are readily toned, passing quickly from the red tint they assume when they are washed. There are no papers, however, which have given so much trouble in toning by the alkaline gold as this Saxe. There seems a tendency with it, in many persons hands, to get a disagreeable, inky, mealy, granulated appearance. There is no real reason why this paper should give these unpleasant tones, and those who have experience know how to avoid them; but as the matter will be more fully entered into when "toning" is considered, the subject will now be waived.

The highly-glazed Rive paper is difficult to tone; and with a gold and hypo. bath it is almost impossible to get a deep purple black without the whites being yellow; but with the alkaline gold it can easily be done. To my mind the richest of all tones are obtained on this paper. The gold seems to enter into union with the albumen, and a singularly rich colour can be produced. To all who are troubled with grey and mealy blacks with the Saxe paper I recommend a trial of the highest-glazed Rive, and I think they will get rid of their troubles.

In forming a comparison between the three kinds of papers, it is seen that if that paper be judged to be the best that gives the highest glaze and allows the most perfect surface definition, the Rive stands the first; if the absence from defects and readiness of toning be the standard, then the Saxe is the highest. Thus, while something may be said in favour of both French and German papers, the English remains behindhand, for it has not the fine surface of the one or the rapid toning properties of the other; but while, unfortunately, it has neither of the merits of its rivals, it in some degree possesses both their defects—the soft porosity of the Saxe and the metal spots and reluctant toning of the Rive. Can it, therefore, be wondered at that English paper is not in general use?

The subject of albumenising is far too important to be commenced here, and must be deferred till next number.

THE PHOTOGRAPHER'S TRIPOD.

By George Shadbolt.

[Read at the Ordinary Meeting of the North London Photographic Association, 26th September, 1860.]

The tripod, in its connexion with photography, may be regarded somewhat in the same light as the bellows-blower in a performance on the organ, each being indispensable to the attainment of the respective ends in view, and neither entitled to any portion of the honour acquired in either case. There is an anecdote on record of an organ-blower who vindicated his own dignity by ceasing to blow in the middle of the finest part of the performance, thus bringing it to an abrupt termination. The indignant organist shouted out, "Blow, you rascal!—why don't you blow?" "Because you said last time the WE did not play, but only YOURSELF,—now *why don't* YOU *play?*"

I propose this evening to vindicate the dignity of the tripod; but I hope to show you that it really has some cause for consideration, and that a portion at least of photographic failures are due to a "weakness of constitution" in this assistant to the landscape photographer, which holds a very subordinate rank. It may be asked why, if a robust constitution be desirable for this useful servant, one is not always engaged with that qualification? The reply is simple: because, as a rule, it involves an extra-robust constitution in the operator himself in order to contend with the additional weight required, which extra vigour cannot so easily be obtained when desired; and therefore, in order to accommodate the contending interests, the vigour of the tripod is too often shamefully sacrificed to the weakness of the operator.

To drop jesting, however, I may remark that the numerous attempts made to produce a portable tripod indisputably indicate the demand existing for an efficient article of the kind; and, as every experienced operator knows full well the great importance of stability in the very foundation upon which the camera rests, it is not surprising that folding tripods bear but an indifferent reputation, and are tolerated rather as unavoidable evils under certain circumstances than adopted with that confidence which a "strict attention to their duties" would ensure.

Before describing an arrangement that I have contrived for my own use, it may be as well to consider what are the desiderata in a tripod? In my opinion the are—

1. Rigidity.
2. A height of not less tha five feet; but six preferable.
3. Portability and lightness.

Rigidity being the most important, must be the first consideration. The height of the lens should not be less than that of the eye when the spectator is standing; but generally it may be somewhat higher with advantage, not only as conducing to a more imposing view of general landscape subjects, but frequently allowing the operator to avoid a foreground of dead wall, or the unpicturesque arrowheads of an iron railing. The consequent lengths of the "legs" is therefore antagonistic to the quality of firmness, which is still further aggravated by any attempt to increase the portability by making the "legs" each length in two pieces; which, however, it is absolutely essential to do with so great a length as six feet, if we do not wish to be put to no end of inconvenience in moving from place to place, especially when proceeding by rail.

Having tested several kinds of portable tripods, and found that in use there was always a deficiency in rigidity, especially when the lower portion of each "leg" consists of a single piece, I determined to attempt a solution of the problem myself, about two years back. The result I am now about to lay before you.

I may mention that I abstained from so doing at an earlier date, as I met with a portable tripod, constructed by one of our most intelligent dealers in apparatus, and which at first view appeared to me to accomplish all that I had attempted with some other conveniences. Subsequent experience has, however, proved to me that, except for stereoscopic or other small cameras, my own form of tripod is decidedly the better of the two. The principle involved in its construction is a close adherence to as complete a system of triangulation as possible. Some of the details may be varied to meet particular cases, but the principle of triangulation must never be lost sight of.

Having completed the theoretical construction of my tripod, I made such variations in the details as would enable me to convert an already existing one into the portable form, and the result is the one I now lay before you. Although an unusually long one, by folding it in halves the length is brought within very convenient limits for being carried about; and though each "leg" consists of four pieces, these are so connected as never to become detached the one from the other, and when put up for use, the different bearings are contrived with a view to afford mutual support, and, as it were, "lock" into one another. The annexed diagrams will explain the construction more perfectly.

FIG. 1.

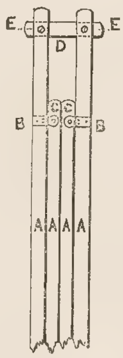


FIG. 2.

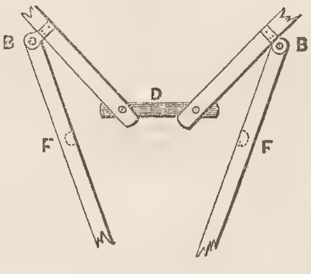


Fig. 1 shows the extremities of the four pieces forming one "leg" when folded—A A A A being rectangular pieces of mahogany $1\frac{1}{4}$ by $\frac{5}{8}$ of an inch in dimensions, the thinnest edge being towards the spectator; B B are two hinges, formed by straps of brass or iron clamped round the outer pieces, and turning on pins at C, so as to allow the outer pieces to be turned quite over, as in fig. 5; D is a thin slip of metal let into slits at the end of the wood, as shown at *fig.* 4, and fastened by pins or screws passing through at E. To set up the tripod, the outer pieces are bent upwards, as in *fig.* 2, until they occupy positions as in *figs* 3 and 5. The outer ends of the slip of metal D fall into mortices at F, *fig.* 3, and thus the two portions of each side of the "leg" are firmly connected by two bearings, viz., at B and at F, in such a direction as to present most resistance to the strain.

FIG. 3.

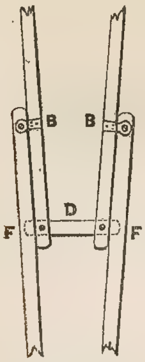


FIG. 4.

FIG. 5.

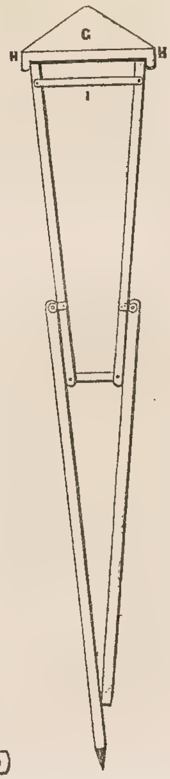


FIG. 6.

A triangular wooden or metal top G, *fig.* 5, is furnished at each angle with pins at H, on to which the ends of the leg-sides, furnished with brass sockets, are "sprung" by slightly squeezing them together; and they are firmly retained in this position by the slip of metal I, an enlarged view of which is shown in *fig.* 6. It is attached to the "leg" by a screw through the circular hole at K, around which it has motion; and on the opposite side of the leg, at a proper distance, is another screw, over the head of which the hole in the slip of metal will pass, and is kept rigidly in place by its falling so as to let the narrower part of the slit embrace the screw with the head of it projecting.

This arrangement is intended merely to save time in setting up the tripod, as I am not sure but that I personally prefer the arrangement of the tripod before you in this particular, in which a screw passes quite through the wooden head, and renders it extremely firm and rigid; but it certainly takes a little more time in setting up.

I can, from practical experience, testify to the efficiency of this tripod for cameras up to a size fit for pictures ten inches by eight inches; and I see no reason why, with a slight increase in the size of the top, it should not be adapted for cameras of almost any size. At any rate, such as it is, it is free to any manufacturer to make this tripod, if he be so inclined.

ON FIXING POSITIVE PROOFS.

By MM. DAVANNE and GIRARD.

(*Continued from page* 267.)

IV. *Number of proofs that can be fixed in the same bath.*—If in a similar solution of hyposulphite of soda we fix a sufficient number of proofs to effect its saturation, the time of fixing, which we have estimated at ten minutes, becomes increased as the point of saturation is approached; but prudence requires that we should only place in the same bath the quantity of salts of silver far below that required to saturate it. Now, the point of saturation of 100 parts of hyposulphite of soda is 38 of chloride of silver (or its equivalent), which is equal to about eight or nine large sheets, 17 by 22, if they have not undergone the first washing, and double that number if we only take this precaution. In practice, from excess of prudence, perhaps, we should not venture to exceed four large sheets, 17 by 22.

We prepared sixteen quarter sheets, and fixed sixteen proofs (10 by 8), in a solution of 100 parts of hyposulphite of soda in 500 parts of water (solution of 20 per cent.). The proofs were first washed in a bath of bicarbonate of soda, then two by two in hyposulphite, where they remained only ten minutes. After being washed and dried, we satisfied ourselves that the whites of the first and last were perfectly pure, and that the two proofs appeared exactly alike. The solution of hyposulphite of soda was filtered after this fixing to remove a slight deposit of carbonate of lime, produced by a little bicarbonate of soda: it had a slightly yellow tint, indicating the commencement of decomposition, arising without doubt (notwithstanding every pains that could be taken) at the moment when the hyposulphite of soda, penetrating the paper, came in contact with an excess of salts of silver. Therefore the bath that has served for one operation should never be employed further, but mixed with the residues.

We may then affirm that 100 parts of hyposulphite of soda, dissolved in 500 parts of water, will suffice to fix successively and continuously four whole sheets, of the value of forty sheets to the kilo (36 ounces), even when we omit the first washing in pure water, in which we persist in from the moment that the nitrate of silver is transformed into an insoluble salt.*

V. *Washing the proofs.* — We often fall into great error with regard to washing fixed proofs; and whilst some photographers, seeing the proofs are faded, pretend that this fading is due to hyposulphite of soda remaining in the texture of the paper, and propose, therefore, that the washing be prolonged from twenty-four to twenty-eight hours,—others, who see good proofs fade and turn yellow by a prolonged immersion in water, assume, on the contrary, that this washing injures the proofs in purity and brilliancy—that the impurities of common water are destructive to them—that we must consequently operate quickly, and perhaps with distilled water.

The experiments we have made simplify greatly this question. It enables us to explain the cause of these exaggerations in two ways, and to show, in practice, a rational and easy method of washing.

Under ordinary circumstances it is rarely that the proofs fade in consequence of the hyposulphite of soda remaining in the texture of the paper; and when this cause of fading manifests itself, it appears in round yellow spots, which destroy the picture by their spreading. This alteration is produced in a very short time—in a few weeks, frequently in a few days, after fixing. But when the picture is destroyed gradually, and turns yellow in an indefinite space of time, according to the dryness of the atmosphere in which it is placed, it is due to fixing in hyposulphite of soda, and on the appearance of decomposition; and it is in this case that prolonged washing only hastens this destruction.

We can affirm, on the other hand, that a long immersion in ordinary water does not injure the proofs; for we have taken proofs, cut them in half, when one half has been washed three hours and the other forty-eight hours, and there was no difference.

Experience proves that we must not attribute an injurious influence to the quality of the water at the moment that ordinary water is stirred; for we have never found the slightest difference between one half of a proof washed in river water during three hours and the other half having remained forty-eight hours in very hard water, to which was added sufficient chloride of sodium to give it a very salt taste: in this case the whites were slightly tinted. An immersion of twenty-four hours in water might influence an injurious action on the pulp of paper, but it would not injure the proof as much as if fixed in a sulphurous bath: in this case the water acts in some few hours, as humidity of the atmosphere acts

* We have also attempted to simplify the fixing. In the course of our researches, we have proved that if we add bicarbonate of soda directly into a solution of hyposulphite of soda, the nitric acid acts upon the bicarbonate before it decomposes the hyposulphite. On the other hand, and in another series of researches, we have ascertained that the presence of chloride of sodium greatly retards the decomposition of the argentifous hyposulphite of soda, even in the presence of light. From this very simple idea we make a bath in the following manner:—

Water	500 grains.	Filter the solution.
Bicarbonate of soda	10 „	
Common salt	25 „	
Hyposulphite of soda	100 „	

It will be preferable to make this solution beforehand, and to filter it at the instant it is used, to separate the precipitate of carbonate of lime, which is not formed quickly. In the quantity of bath above indicated we have passed sixteen proofs, 8½ by 10½, in removing them from the printing frame; but we have not found the same result as by employing two separate baths. The tone of the proof is not so strong as at the commencement of the fixing. The bath filtered immediately had evidently the same tint as the first. Always after forty-eight hours of repose it will acquire a much deeper tint than the bath of simple hyposulphite. It has then a greater tendency to decompose: its employment is doubtful, and must only be sanctioned by practice. It is probable that this difference is due to the action of carbonic acid set free in the bath.

in a much slower manner, and hastens the fading, which would not have been apparent for a length of time.

The washing therefore can be very simply done if the proofs have been well fixed. An excess is not to be condemned; but it is useless, and should be confined to washing out the hyposulphite of soda.

In general we should use dishes about four inches in depth, using a large quantity of water, which should be renewed every half hour, removing each proof one after the other. After the sixth we may be sure of a complete washing; but we may assure ourselves that it is completed by a very simple method, first used by M. Bayard. All photographers have a test of exquisite sensibility for hyposulphate of soda: this is nitrate of silver.

If to water containing five-millionths of its weight of hyposulphite of soda a crystal of nitrate of silver be added, the characteristic yellow tint of sulphide of silver will be shown.

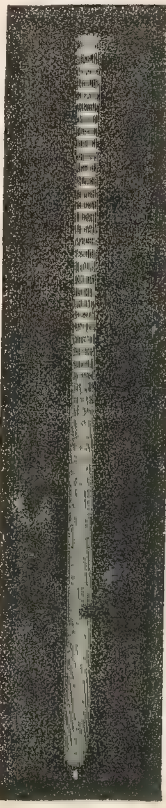
The most convenient way of employing this test is to lift a proof out of the bath when we think the washing finished, and to allow a few of the last drops that drain from it to fall into a white porcelain basin, and to throw into it, without stirring, a fragment of nitrate of silver about the size of a pin's head. If the yellow colour does not appear instantly at the bottom of the basin, or if it is not very apparent, it will bear another washing as a further precaution: if, however, the colour changes rapidly from red then to black, it will require two or three more washings. Independently of toning, which does not at the present moment demand our attention, we think that hyposulphite of soda, employed as now recommended, will not entail risk as to the stability of the prints, and that they will be in a condition to keep for any length of time if protected from atmospheric influences or exhalations which tend to attack the silver.

ON THE ACTINISM OF ELECTRICAL VACUUM TUBES.

By Professor W. B. Rogers.

[Being an extract from a letter to Mr. Gassiot, read before Section A, at the Oxford Meeting of the British Association for the Advancement of Science.]

I send you, by my brother, a printed abstract of remarks made some months ago on the phenomenon of the vacuum tubes, and a hypothesis as to the condition and cause of the stratifications.

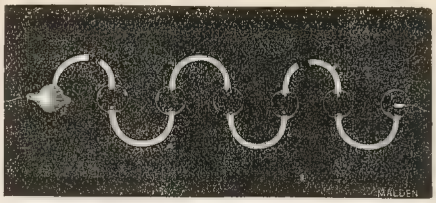


You will see that, with the aid of Mr. Ritchie and our skilful photographer, Mr. Black, I have been experimenting on the actinism of these electrical discharges.

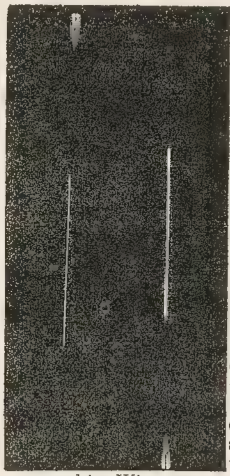
In some more recent trials I have obtained beautiful photographs of the stratification, of which I send you a specimen. The tube, as you will see, is a straight one, of uniform calibre. It is about fifteen inches long, by three-quarters inch diameter, and is marked by Geissler as containing phos. hydrogen. As you have perhaps observed, it gives the strata with extraordinary distinctness; and after the action has been continued a little while, the strata near the blank end *arrange themselves in pairs, consisting each of a bluish and a more reddish layer*, separated by a blank interval from the next, as seen very plainly in the photograph.

By a steady, rapid motion of the ratchet-wheel of Mr. Ritchie's coil, it was easy to keep the strata almost perfectly stationary. The picture was obtained with eighteen turns of the wheel, each giving twelve sparks. With six turns a tolerably clear picture was secured.

You see that the unilluminated space at one end made no impression, and that the intervals between the strata are also as devoid of actinic as they are of luminous rays.



The picture of the *winding tube*, with bulbs, shows how *superior* is the actinism of the faint *blue* light of the negative end compared with the brighter and less refrangible rays of the opposite bulb.



The third photograph was produced by the two slender Geissler tubes, containing respectively N and CO_2. The former was placed below the latter as they were presented before the camera, and the current was sent through them in succession. To the eye the intense whitest light of the CO_2 tube was more dazzling than the crimson colouring of the other. Yet you will observe the picture made by the latter is far the stronger of the two, as indeed might have been expected from its more refrangible illumination.

This photograph was produced with half a turn of the wheel, that is, six successive flashes of the light. I am unable to state the aggregate time of exposure to the rays, as I have not yet ascertained the duration of a flash. This I hope, with Mr. Ritchie's aid, to accomplish at an early day. But if we assume the time to be as much as tenfold the duration of the electric spark, as measured by Wheatstone, we should have less than $\frac{1}{20,000}$th of a second for the entire time which the light required for producing this intensely clear picture. I believe that a single flash would suffice, but I have not yet made the trial.

CELESTIAL AND INSTANTANEOUS PHOTOGRAPHY.

By Warren De la Rue, Esq., F.R.S., F.R.A.S., &c.

(Continued from page 272.)

Degree of Perfection hitherto attained in Lunar Photography.

In my own telescope, the picture of the moon is only about $1\frac{1}{10}$ in. in diameter; it might be suggested that the image could be enlarged by means of a combination of lenses before reaching the sensitised plate, but this would have the effect of prolonging the time of exposure, and moreover introduce the disadvantages of the refracting telescope, and the result would not be so good; for even if the moon's motion in declination were followed automatically, still the outstanding atmospheric disturbances before alluded to would remain.* Indeed, if the aperture of the telescope could be, considerably increased in relation to its focal length, much finer pictures would be procured, because the time of exposure would be shortened. In practice it has been found preferable not to magnify the focal image, but to take enlarged positive copies on glass direct from the original negative, by means of an enlarging camera, and in this way the impressions, 8 inches in diameter, exhibited at the meeting were produced.

In making positive copies, some of the more minute details are, unfortunately, always lost, for no means exist by which enlarged positive copies can be produced showing all the treasures of the original negative; a perfect enlarging lens being still a desideratum.† As an instance may be cited the streak in the lunar disc which Mr. James Nasmyth has called "the railroad," indicated in

* Monthly Notices of the Roy. Ast. Soc., vol. xviii., p. 17.

† Since the above was written, the author has been informed by Mr. Dallmeyer (son-in-law of the late Mr. Andrew Ross) that he has brought his investigations on this subject to a successful termination, and that he has just produced enlarging and diminishing lenses which copy without any sensible distortion or dispersion.

Beer and Mädler's map as a straight line to the east of the cratur Thebit, between latitude 19° and 23° south, and between longitude 7° and 9° east. In the photograph it is shown to be a crack in the lunar crust with an irregular outline, and the eastern edge is perceived to be depressed below the western, which forms a perpendicular cliff. This, although sharply defined in the negative, is frequently lost in positive copies. For the examination and micrometrical measurement of the minuter details which celestial photography is capable of furnishing, recourse must still be had to the original negative.

Notwithstanding the disturbances which arise from the atmosphere, minute irregularities in the driving-clock, and the want of means for following the moon's motion in declination, I have obtained pictures of the moon that bear examination with the three-inch object-glass of a compound microscope magnifying about 16⅔ times, and which show with good definition details occupying a space less than two seconds in each dimension. Two seconds are equal to about $\frac{1}{800}$th of an inch on the collodion plate in the focus of my telescope, and in the finest photographs, details occupying less than $\frac{1}{1000}$th of an inch are discernible with the three-inch object-glass; hence much valuable work has already been accomplished. A second on the lunar surface at the moon's mean distance being about one mile (1·149 mile), it will be evident that selenological disturbances, extending over two or three miles, would not escape detection, if such occur, provided photographs continue to be taken for a sufficiently long period.

Lunar Phenomena recorded by Photography.

Full Moon.—Variations of Apparent Diameter.—By the delineation of our satellite, photography brings out palpably several phenomena which, although well known, are not always present to the mind; for example, about every 29 days it is stated that there is a full moon, but we see by the photographic picture that there never is a full moon visible to us, except just before or just after a lunar eclipse, or at all events except when the sun, earth, and moon are very nearly in the same plane; at all other periods of the full moon we are unfavourably situated for seeing the whole of the illuminated hemisphere. Moreover, the different apparent diameter of the moon at various times, dependent on her distance from the earth, comes out in unmistakeable prominence in a collection of photographs; for the pictures taken with my reflector vary in diameter from one inch to one inch and nearly two-tenths (1·0053 inch to 1·1718 inch, being at the moon's mean distance 1·0137 inch).

When positive enlarged copies are made, it is easy to obtain all the pictures of exactly the same dimensions by the adjustment of the distance of the negative to be copied from the lens of the camera; and my enlarging camera is furnished with screws to facilitate the adjustment of the distance of the object to be copied, and also that of the focussing screen.

Libration.—We are familiar with the terms "diurnal libration," and libration in "latitude" and "longitude," yet it is difficult to realise the great amount of disturbance in the aspect of the moon's disc, and the direction of the displacement from the mean position which these several causes produce unless aided by photography, when we see them palpably before us.

The diurnal or parallactic libration never exceeds 1° 1′·5; the direction of the displacement in the markings on the lunar disc which it produces is variable, and is dependent partly on the position of the observer.

The poles of the moon at the epoch of mean libration are situated in the periphery, and the equator and all parallels of latitude are straight lines; the circles of longitude being more or less open ellipses, varying from a straight line in the centre to a circle at the periphery. This occurs when our satellite is either in perigee or apogee (when the libration in longitude is at a minimum), and she is also situated in one of the nodes of her orbit (when the libration in latitude vanishes): the nodes, apsides, and moon would, under these circumstances, be in the same line.

Libration in longitude merely causes a change of place in the various circles of longitude, which still continue to be more or less open ellipses; the parallels of latitude straight lines.

Those lunar craters, however, situated on the central meridian at the epoch of mean libration, would be on a straight line, but, at the periods of maximum eastern or western libration, they would be seen arranged on a semi-ellipse, whose conjugate diameter is 0·1377, the moon's diameter being unity. Therefore a point at the centre of the moon's equator becomes shifted by the sum of the librations to the east and to the west to the extent of more than ⅐th of the moon's diameter, namely, 0·0688 to the east, and the same quantity to the west of the mean position. On account of perspective, the effect of libration in longitude is much less apparent on the eastern and western peripheral meridians, which shift towards the centre by a quantity equal only to $\frac{1}{210}$th of the moon's diameter (0·0048).

The equator and its parallels, which at the period of mean libration in latitude were straight lines, become more or less open ellipses under other circumstances; the ratio between the conjugate and transverse axes of all the parallels being constant for a given inclination of the lunar axis. At a maximum libration in latitude the equator becomes an ellipse, whose conjugate axis is 0·1181; the transverse axis being equal to the diameter of the moon considered as unity: so that a point in the centre of the equator is shifted 0·059 of the diameter to the north or to the south by a maximum northern or southern libration, and will move by the sum of these librations to an apparent extent of ⅛th of the diameter of the lunar disc. The apparent motion of the north and south poles towards the centre is on account of perspective only $\frac{1}{280}$th of the diameter (0·0035).

Libration in latitude also causes a change in the ellipses which delineate the meridians, causing an inclination of their axes to the line joining the poles, and also a change in the ratios of their transverse to their conjugate axes. For example, the meridian distant 7° 55′ from the centre (this being the position of central meridian at a maximum libration in longitude) would have its transverse axis inclined 0° 56′·3 to the pole, the conjugate axis being no longer 0·1377 but 0·1368 of the transverse. The peripheral meridians would no longer be semi-circles, but semi-ellipses, whose conjugate diameter is equal to 0·9965, and whose transverse diameter is inclined 90° to the pole.

(*To be continued.*)

PHOTOGRAPHY A CHAMELEON.

"When next you speak of what you view,
Think others see as well as you;
Nor wonder if you find that none
Prefer your eyesight to his own."

A FRIEND of ours has set up an image which, at the sound of his own music, he commands all the faithful to fall down and worship. There is no fiery furnace, it is true, held *in terrorem* over the misdemeanants; but one does not like to be charged with thoughtless extravagance, especially by one who confesses his helm has been turned the same way as ours. He sings the glory and praise of the early photographers, and forgets the exceeding merits of the new.

We much question whether Daguerre himself, could he walk down a London street now-a-days, would have much to say against even the collodion positives, of which our friend is so deprecatory. Of course there are grim, ghastly, ghoul-like portraits perpetuated in this way; but who prefers a daguerreotype portrait now to a good one on collodion? Besides, it is almost "Hobson's choice" with the former: the operator is deterred by the cost from trying again, if you object to the first. In vain do you or your friends find fault. The nose, that Roman of which you are so proud; those whiskers, which excite your vanity; those eyes, whose penetration you make so much of;—the first is too snub, the second resemble the foliage on a windy day, the third are evidently trying to take in both ends of the room! There they all are—irremediable! You pay your money, but you are not allowed the benefit of a choice; whereas collodion is so cheap that the artist must be a niggard indeed who does not himself find fault, and say we can do better than that, and forthwith tries again. It was a labour, indeed, sitting in the old time for one's portrait; now you have half-a-dozen for *cartés de visite* taken at once.

Daguerreotype had, and has, advantages. The art was founded by its experimenters. Watt elaborated the steam-engine from a teakettle; and similar inventions, now so essential and complex, have had a like humble origin, for which they deserve the greater praise. We think the gentleman who overhauled his portfolio, and concluded that all was vanity and vexation of spirit, drew most probably a just inference; but who was to blame but himself? If anybody is to be hung, who must it be? Not the inventor of collodion, and the scores of ingenious contrivances and processes springing from it. We know no one who has tried more things in this way than the editor of the *Photo. Quarterly* himself, and now he wants us to fall back on—what? Daguerreotype! with its glaring

reversed results, which certainly do fade and often disappear; though, like most things, they can, with care, be preserved a long time, and can even be re-developed, and on paper. Paper indeed! Does any one remember direct positives on paper? What wonders those were! A large discount had in those days to be allowed for failures, so large as almost entirely to deter amateurs from the art; and, if they ventured on the task, soon to disgust them.

Some of our Manchester friends used to practise calotype, but it seems entirely abandoned now. Some of them are now at turpentine waxed paper, and we know not what complications these enthusiasts may venture on next; but the majority use some dry process on glass. We have some of Mr. W. Newton's calotypes before us, and one of Mr. Sutton's own permanent pictures, all sadly below the present standard; and we are not even content with a view of Rouen from the establishment of B. Evrard, at Lille. This gentleman achieved great success, but perfection was not to be found five years ago, even at Lille.

Now, photographers, as a rule, are economical; they certainly embark largely in fancy cameras, and paraphernalia of exceeding costliness, but we hear of them saving washing and clippings, and then troubling the assayer to transmute the residue into current coin of the realm. There is not much wear and tear in apparatus; so these two causes must be added to those named, as occasioning a bad trade latterly. You don't buy, because you don't want, new apparatus every day; and the rapidity with which a quantity of work can now be got through, reduces the necessity for seizing every suitable moment to get your portrait taken. We think an appeal to the ledgers of some of our professionals would show a great difference in favour of 1860 over 1850; if not, we are much mistaken.

Altogether we have reason, we think, to be satisfied with the present position and future prospects of the art. At the same time we are guiltless of any desire to sully the fair fame of the early operators, whose experiments every day commemorate themselves, so to speak, in every laboratory. Σ

ON THE ADAPTATION OF MACHINERY TO PHOTOGRAPHY.

By G. H. Babcock.

[Read before the Photographical Society, at the August Session.]

In this age of steam, telegraphs, and photography, when the three most subtile agencies of nature, light, heat, and electricity, have been subdued by man, and trained to do his bidding, startling developments and astounding applications in art and science are looked for as an almost daily programme in the great drama. Is it, then, to be wondered at that the go-ahead Yankee, in his impatience of the slowness of this "fast" age, should conceive and actually carry out the idea of applying steam power to the production of photographs, and should turn them out at a speed which eclipses the boasted rapidity of the "lightning" printing press?

As an evidence that this may be and even has been accomplished, I have the pleasure of presenting for the inspection of the Society, this evening, several specimens, among them a sheet containing about three hundred photographs, all printed from one negative, at the rate of *twelve thousand an hour!*

Astonishing as this speed may seem, I am assured, and from what I have seen believe, that it may be greatly increased.

The means by which this is accomplished is simply the adaptation of machinery to the process of printing by development. This process, though little used of late, has certainly produced some very fine specimens, and prints so produced are generally conceded to have the advantage in permanency over the ordinary print produced by the direct action of light.

This machine is the invention of Mr. Charles Fontayne, of Cincinnati, O., who has spent several years in perfecting it and the developing process which he uses therewith. I am assured by him that the process by which these specimens were produced is quite different from any other known, but in what this difference consists I am not informed. A negative is fixed in a box together with a sheet of prepared paper, and the latter exposed by automatic machinery to the condensed light of the sun passing through the negative. After each exposure the paper is traversed underneath the negative to present a fresh surface for the succeeding impression. These motions, together with that of clamping the negative into close contact with the paper at the instant of exposure, are all performed by the operator simply turning a crank.

The rapidity at the several times I witnessed its operation was two hundred impressions per minute, at which speed the exposure was but ·03 of a second for each impression. The condensing lens being seven inches in diameter, and the circle of condensed light about one and a-half inches, the above exposure is equal to ·65 of a second direct exposure to the light of the sun. If, therefore, the machine were to be used for a larger class of pictures, such as book illustrations and stereographs, a condensing lens might be dispensed with, and yet nearly twenty-five hundred impressions be taken in an hour!

This opens a field for photography hitherto impracticable in consequence of the time and expense of printing as ordinarily practised. The illustrations of a book, having all the requisite beauty and perfection of the photograph, may be turned out by the use of this machine with a rapidity wholly undreamed of either in plate printing or lithography. The expense of engraving may be dispensed with, and the negative come direct from the artist's hands, drawn upon a prepared glass, from which, in the course of a few hours, the plates for a large edition may be printed—each one a perfect duplicate of the original drawing. As an evidence of the facility with which this may be done, a print produced by the ordinary ammonia-nitrate process, from a rough sketch so prepared, is herewith presented. It will be seen that an ease, freedom, and spirit is given to the drawing which cannot be equalled by any process of engraving, and, when the negative is properly prepared by an experienced artist, nothing further could be desired for illustrating ideal subjects; but for the actual, and for reproducing the works of others, of course the draughtsman would give way to the far more truthful camera.

But besides book illustrations and portraits for visiting cards and advertising purposes, of which specimens are shown, this machine may be applied to the multiplication of stereographs, which, by its use, may be made so cheaply as to bring them into the humblest family, where by their exquisite beauty and truthfulness they will foster a taste for the beautiful, and in time entirely eradicate the cheap and disgustingly coarse lithographs, engravings, and water-colour daubs which at present form so large a proportion of the pictures within reach of the poor.

When these new adaptations of photography shall have been fully accomplished, then shall our noble art, which has already done more to develop and elevate the taste of the present generation than any other one instrumentality, take a stand by the side of its great sister art, Printing, and hand in hand will they go forth to educate, ennoble, and elevate mankind.

The pictures herewith presented possess additional interest to this Society from the fact that they are taken upon ordinary American writing paper, which was not prepared especially for photographic purposes. Mr. Fontayne first used this paper in his experiments on account of its cheapness, and having become accustomed to it he now prefers it to any of the foreign photographic papers. In the course of his extended experiments he has used almost every variety of American paper, including that made from straw, manilla, and cane, with varying degrees of success, and promises at some future time to present the results of these experiments to this Society.—*American Journal of Photography.*

STEREOGRAPHS.

English Lake and Other Scenery, by Thomas Ogle, *Preston.*

There has been no season in our recollection so unfavourable to the tourist as that which we have experienced during the present year; and it appears to us little less than a miracle that photographers should have been able to obtain any presentable results at all under such very adverse circumstances as have been almost universally and uninterruptedly prevalent throughout what we presume must by courtesy be called the spring, summer, and autumn of 1860. Photographers as a class are, however, of a patient and hopeful disposition: hence, when such persevering adepts as Mr. Ogle make up their minds to "carry off" a certain object, why it becomes merely a question of when—the *how* having been already settled and provided for. Accordingly we find that while tourists have been waiting for the fine weather to set in, and expecting in vain, Mr. Ogle has taken advantage of a few smiling moments, few and far between though they have been, and as the tourists could not go to "the lakes," he has brought the lakes to them; and, so well had he laid his plans, it is no lame apology that he offers to our notice, but the veritable pleasant spots in all their summer beauty. He has not only performed the task which he set out to do, but, need we say, when we have already mentioned Mr. Ogle's name, that he has done it well. Let us tell our fireside travellers what a treat is in store for them during (we had almost said the rest of) winter.

HEAD OF WINDERMERE.—There are three distinct and separate views from this spot, all with natural clouds, and each one having a separate beauty of its own. No. 139 will be that preferred by the artist, on account of the atmospheric effects and aërial perspective, which are truly charming when this somewhat sombre-looking slide is viewed in the stereoscope. Langdale Pikes, which *out* of the instrument are so blended with the clouds as to be almost indistinguishable from them, when viewed by its aid instantly attract the observer's attention, distant as they are, and robed in a gauzy garment of moisture. With No. 137—the view taken from above Bowness, with Loughrigg Fell and Langdale Pikes in the distance—the ordinary photographer will be most charmed, the picture being sharp, clear, and distinct; while No. 108 would probably obtain most suffrages from a constituency of the general public, as it possesses artistic merit in a considerable degree, and is altogether a very pleasing subject. In the immediate foreground, on a grassy knoll, a black and white cow is quietly reposing, and her figure stands out in strong relief against a mass of large trees in the middle distance, which skirt the edge of the lake, serving by the gracefully undulating outline of their tops to break the monotony of the water line. Along the right hand margin of the lake various creeks and miniature bays, with here and there a long reaching promontory clad with a verdant fringe of shrubs and little trees, may be noticed; while beyond the further shore Loughrigg Fell, dashed with a gleam of light, is backed up by the grotesque outline of Langdale Pikes, forming a pleasing contrast to the beautifully-rounded forms of the masses of soft clouds above.

No. 127. BOW FELL AND LOUGHRIGG TARN.—In this slide we have the same Pikes in the distance, but seen from a different point of view—this time bounding the vista of a long valley shut in on either side by lofty hills.

No. 109 will, without doubt, be a favourite; and deservedly so, for a happier specimen of charming English lake scenery it would be difficult to obtain. The subject is WINDERMERE LAKE, LOOKING TOWARDS LOW WOOD. The view is taken from above a huge mass of rock, and the spectator looks down upon a substantial residence with farm buildings hemmed in by a dense wood. Two or three reaches of a small river are seen to the left, embracing in its sinuosities another small plantation of trees, behind which it unites its waters with those of the lake, on the further side of which gently sloping hills, clad with abundance of verdure, interspersed with houses here and there, make up one of those views which cause the lover of natural scenery to linger long and gaze with ever-increasing pleasure.

We now come to some delightful subjects, which though of a kindred, are still of a different, class, and remind us very much of Mr. Wilson's favourite studies.

No. 103. BOBBIN MILL, NEAR STOCK GHYLL FORCE, AMBLESIDE.—This does not sound very attractive as a description of a most exquisite composition, which it is, the said bobbin mill really forming only a very insignificant incident therein—the ugly chimney-shaft being judiciously obscured by the projecting branches of a tree, under the boughs of which the water-wheel is to be seen, and from which the little fussy, foamy stream dashes and tumbles over the stony bed, half smothered by the brambles and other lowly vegetation on the bank. The mill itself is nearly hidden by some tall fir trees, which, in their formal regularity, contrast well with the somewhat straggling and dissipated-looking trees on the opposite bank.

HAWES BRIDGE ON THE KENT, NEAR KENDAL, No. 87, makes an admirable picture, though in an architectural point of view it would be held but in very small esteem. It consists of nothing more than a couple of rough stone arches—one of them only spanning the tranquil waters of the Kent—which are given with all the truth of nature. But who shall describe the mass of *natural masonry* from which these arches spring? or tell how the ivy and rushes and *equiseta* adorn the unpretending structure? On a projecting mass of the near bank is a boy fishing, and through the arch the river is seen to wind and lose itself to view behind the leafy screen of its own wooded banks.

THE WILD BROOK, BABBLING DOWN THE MOUNTAIN SIDE, No. 93, is truly a photographic gem, and would form an admirable subject for a large painting. The spectator is looking up the stream, which comes dancing down the ravine in a soft mass of foam over the huge boulders, which are smoothed and rounded by its continual play. Both edges of the ravine are clothed with shrubs in wild luxuriance, and the whole is seen through a vista formed by the overarching boughs of a birch tree and a holly on opposite sides of the stream.

As a contrast to the preceding we must notice No. 76, which presents to us a phase of nature in calm repose—a stream of water, smooth as the surface of a mirror, reflecting the low bushes on the wall, and the tall elms behind. It is thus described:—

> "Here could I stand and muse and muse,
> And dream fresh fancies as the stream glides on."

From Westmoreland we get some very beautiful illustrations. Two taken from NEAR RYDAL MOUNT, Nos. 91 and 92, are very similar in character, and both perfect in manipulation. The subjects are very difficult to render truthfully by photography, in consequence of the dense mass of foliage contrasted against the light-reflecting surface of the stream; yet we can with truth affirm that the execution of these two specimens leaves nothing to be desired: the foliage is not too dark, nor is the water too white. The more they are examined the more they are appreciated. We have already stated that both are beautiful, but in No. 91 especially there is a whole volume of poetic fancy embodied. As an art-composition this would command universal attention and admiration. The subject is a wild ravine, along which a mountain stream rushes over the rocks which, at irregular intervals, stand out in bold relief, draped with soft mosses kept in constant luxuriance by the ever-moistening spray. In the immediate foreground are some unusually large masses, and these are hemmed in by very tall trees which join overhead throwing three-fourths of the whole subject into deep shade; but, deep as the shade is, every detail of branch and leaf is just as visible as in nature. A small portion of sky only is to be seen, and that through the upper branches of the trees. The stream, soft and pearly in tint, occupies but a small portion of the entire area; but in the more distant part of the ravine, where the upper foliage is less dense, a glorious burst of light comes in which gives vigour and fresh value to the whole. This is one of the finest specimens of its class that we have ever had the pleasure of examining.

THE UPPER FALL, No. 96, and THE LOWER FALL, RYDAL PARK, No. 95, are also exquisite in subject. The former, though very good, is a little over-developed, and consequently spotty. Mr. Ogle's general high standard may have made us somewhat hypercritical. But the "Lower Fall" is peculiarly charming, the water streaming in soft foam down a steep declivity, and the magnificent fronds of graceful ferns projecting from the perpendicular rocks on the left.

In addition to the Lake Series, we have also before us several admirable vews of RAGLAN CASTLE, KENILWORTH CASTLE, and TINTERN ABBEY, all executed with the same skill that we have been so pleased to recognise in those already noticed. Amongst those of Raglan Castle we prefer No. 3, THE VESTIBULE LEADING TO THE BANQUETTING HALL; but where all are so good it is difficult to select. Of the Tintern Abbey collection, two, which we may designate as semi-interiors, are especially pleasing, being Nos. 23 and 24, representing the principal aisle—one from the east the other from the west, the former containing the picturesque west window. With regard to the printing and toning of these stereographs, we can only say that they are unusually fine, being of a rich, warm, brownish-black tone, and without flaw of any kind.

We could well have given a more detailed account of these last-mentioned productions, but space will not permit us to do so on the present occasion. We are highly gratified to find that, in spite of the unfavourable season, the practice of stereoscopic photography at least has progressed at a far more rapid pace towards perfection than we could possibly have anticipated. We are indeed surprised as well as delighted with what has been achieved. We have already described some of the beauties that are to be had: we have others of a different character yet to lay before our readers, which we hope to be able to do in our next.

Letters to a Photographic Friend.

No. VI.

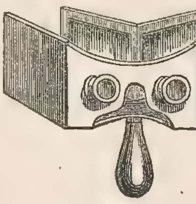
DEAR FRANK,

I proceed to tell you of the things that interested me at the other houses I visited in the city.

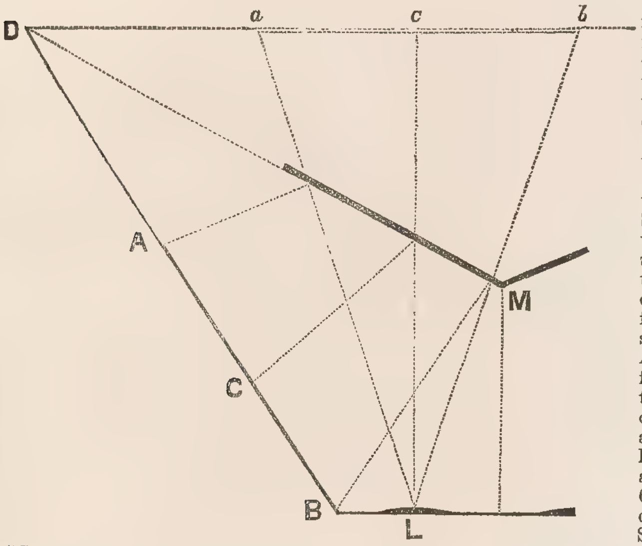
At Negretti and Zambra's I had brought under my notice a series of transparent stereoscopic views of the scenery and natives of Japan, executed by the photographer sent out there by this firm. These were of great interest, and the groups of Palms that predominate in nearly every view are exquisitely rendered. How long will it be before we have the characteristic Flora of the various phytogeographic regions of the world brought home to our firesides by means of camera and stereoscope? May this instalment be quickly

followed by similar ones! One slide gives a capital idea of the external and internal aspect of the fruits of the country, others of the physiognomy of the male and female natives of Japan, or of their habitations and surroundings.

I next turned my steps towards Mr. Cox's, of Skinner Street, Snowhill. Here I had an opportunity of examining Mr. Sutton's new form of stereoscope. The form of this instrument I will convey to you by means of the annexed sketch. The framework placed at an angle on each side of the lenses is for the support of the two pictures, and the angular portion opposite the lenses consists of two plane mirrors, that reflect each picture into the axis of each lens. The lenses are plano-convex, of six inches focus, placed two inches and a half from centre to centre: they are entire, and may be achromatic if desired. The pictures are four inches square, the negatives of which are taken in a twin-lens camera, on a plate eight and a half by four and a half inches, placed in "a non-reversible slide"—that is to say, with the film on the back instead of the front of the plate, so that the two views are taken right *through* the glass. The lenses of the camera *must be* of the same focal length as those in the stereoscope, viz., six inches, and placed four and a quarter inches from centre to centre. This arrangement is *necessary* that the objects may not appear *reversed* when inspected in the stereoscope, and that they may produce an idea of magnitude.



Mr. Sutton thus describes the geometry of this instrument by aid of the annexed diagram:—



"Suppose the pictures to be four inches square, then the distance Lc must be six inches. Set off ca, cb, equal to two inches, and join the line b B (not shown in the figure), B being the nearest corner of the left picture. Bisect b B at right angles by the line D M. This gives the position of the left mirror, and by joining D B you get the position of the left picture A C B.

"It will be seen that $a\ c\ b$ is the virtual image of the picture A C B, C being the point where the axis of the camera cuts it. This reversed image is formed by reflexion in the manner shown by the dotted lines.

"According to this construction the axes of the eyes are parallel when directed towards the centres of the pictures, that is, towards the points in which the parallel axes of the lenses cut the pictures when a twin-lens camera is employed. But it must not be supposed that the same object C in both pictures is always united at an infinite distance; for when the axes of the lenses are parallel the same object does *not* occur in the centre of both pictures unless that object is at an infinite or very great distance. The images of near objects will be united by converging the optic axes at the same angles as in natural vision."

I examined several stereographs in this reflecting instrument, and they certainly conveyed an idea of the magnitude of the objects delineated that is not attained by the lenticular stereoscopes we have been accustomed to. I could not detect any signs of distortion in the stereographs brought under inspection; and the instrument occupies no more space than an ordinary stereoscope, so that it may be regarded as an improvement on the old forms, and a step in the right direction.

Mr. Sutton, I found, had just sent Mr. Cox a box of negatives taken by his Triplet and Panoramic lenses, that those interested in these inventions might have an opportunity of criticising their respective merits. The subjects of these negatives are certainly most *judiciously* selected for the purpose of criticism, for there is hardly a line perfectly straight to be found in these views whereby to test the lenses as to their freedom from *distortion*; and there is such abundance of foliage at the marginal portions that it is difficult to know whether parts wanting in definition are to be attributed to defects in the lenses or to motion of the foliage caused by wind.

With regard to the negative produced by THE TRIPLET, this is taken on a plate 10 by 10 inches. The focus of the lens employed was fourteen inches and a half. Therefore the surface covered is, in relation to the focal length, in the proportion usually considered as fairly available, viz., two-thirds; for if, in round numbers, we call the focal length 15 inches, $\frac{2}{3} = 10$ inches. The size of the stop employed is not stated. As there appeared to be a distortion of the "pincushion" kind in the rendering of a chimney in a cottage, and this in the marginal corner of the negative, I compared the negative with one of the four-inch stereographic prints of the same subject stated to be taken from the same spot, and, on measuring with a goniometer the angle between the slope of the roof and the perpendicular line of the chimney, I found, as the eye indicated, that there was a greater angle formed in the view rendered by the triplet than in the one taken by a stereoscopic lens of six inches focus; moreover, *in the negative, the angle increased* at the *upper part* of the chimney, whilst in the stereoscopic print the perpendicular line of the chimney was straight from the top to the base. This seems to confirm the suspicion (of course only founded on the evidence of the single negative sent to London for the purpose of being criticised) that the triplet, as at present constructed *or manipulated*, gives the "pincushion" distortion at the marginal portions of a field that it might fairly be expected to cover without a fault. Mr. Sutton contrasts this 10 by 10-inch negative with a negative of *the same size* taken by a Ross's landscape lens of *nine inches focus, with a quarter-inch stop;* and on a label attached to it he calls attention to the "frightful distortion of the chimney on the left." There is no question about the frightful distortion. They say "comparisons are odious," and the saying holds good in this instance, because they are not fair. Apply the same rule to Mr. Ross's lens, as to the proportion of field that it might fairly be expected to cover without distortion, then $\frac{2}{3}$ of 9 inches$=$6 inches. Therefore Mr. Sutton ought not to expect it to cover a plate of 10 inches square, and put it in comparison with his lens of $14\frac{1}{2}$ inches focus. But on his label he asks people to observe that "not more than a diameter of six inches is passably good;" but this surface of 6 by 6 Ross's lens is free from distortion, which is more than can be said of the surface of 10 by 10 covered by Mr. Sutton's triplet. Mr. Ross, in his catalogue, only professes to render pictures 6 by 5 inches with his No. 1 lens of 9 inches focal length. *Beyond* these limits distortion begins to make itself apparent. The negative from THE TRIPLET ought to have been put side by side with one from a Ross's No. 3 lens, of 15 inches focal length, which is put forth as covering a surface of 10 inches by 8, for the comparison to be anything like a fair one. Moreover, it would have been better if both negatives had rendered the same view from the same spot, which is not the case.

I also examined a negative on curved glass, taken by the panoramic camera, which included the two views rendered on the two 10-inch by 10 negatives I have just referred to. This specimen of what the panoramic lens is capable of is decidedly superior to the negative exhibited before the meeting of the London Photographic Society, which is still in Mr. Cox's shop; but whilst the middle and left-hand sides are in parts well defined, the right-hand portion is very weak. Whether to attribute this to an unsymmetrical fault in the lens, or to the curve of the glass plate, or careless manipulation of the film, I know not; but I do not think this perceptible inequality in the character of the negative is attributable to inequality of illumination of the subject. The objects delineated in the negative are nearly all in the same plane, there-

fore it does not afford an opportunity of judging of the "depth of focus" said to be a characteristic of this lens. The angle of view is extraordinary; and if this form of lens and camera were brought to perfection, I think it would be *the* instrument for military and naval purposes. If for the latter service, the camera should be mounted on Professor Piazzi Smyth's "free revolving stand" or gyrating apparatus, described in his work on Teneriffe, so as to render the instrument independent of a ship's motion.

Finding that I could not "do" the entire City to-day, I retraced my weary steps to the "Garden." In my next I hope to describe what I saw in my visits to the remainder of the City establishments.

And so remain,
Yours for ever,
SIMEON HEADSMAN.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The first ordinary monthly meeting for the season of this association was held at Myddelton Hall, Islington, on Wednesday, the 26th ultimo,—George Shadbolt, Esq., V.P., in the chair.

Mr. John Barnett, the honorary secretary, having read the minutes of the last meeting, which were confirmed, the ballot for new members took place, when Mr. J. T. Bell was unanimously elected a member of the society.

The chairman then introduced to the meeting some fine stereographs, the production of Mr. Ogle, of Preston, representing Tintern Abbey, Raglan Castle, and English lake scenery. [For a notice of these, see page 285.]

A Member observed that the specimens appeared to be a little over-printed, to which

The Chairman replied that the objection made would not be observable in the stereoscope.

G. Wharton Simpson, Esq., exhibited some specimens of waxed albumenised paper negatives, possessing great sharpness, produced by a new process not yet published. The inventor is Mr. H. Hooper, of Manchester.

Mr. Hill expressed his opinion that they would be more suitable for large than small pictures.

The Chairman replied that, in his opinion, they would be suitable for either stereoscopic or large negatives.

Mr. Bingham stated that, in preparing some dry plates, he had experienced some annoyance from the production of blisters on the film. He found he had been able to correct this by applying a coating of dilute albumen.

The Chairman remarked that that was the course usually adopted by albumen operators.

The Chairman having vacated the chair for the purpose of reading the paper of the evening, —— Moens, Esq., temporarily took the chair, when

Mr. Shadbolt read a paper on *The Photographer's Tripod*. [See page 281.]

Messrs. Dawson and Hughes having commented on the mechanism of the stand exhibited, were of opinion that, with the view to avoid a tendency to vibration, it would be necessary to construct the lower limbs of the tripod below the hinge. Mr. Hughes added that, for his own part, he preferred the mode of construction adopted by Mr. Shave.

The Chairman observed that as greater strength was imparted to the hinge joint—the plan proposed by Mr. Shadbolt—his tripod might fairly be considered an improvement on the old form.

Mr. Hughes asked Mr. Shadbolt's opinion whether ash would not be the best material for the legs of the tripod?

Mr. Shadbolt, in reply, said that in the tripod now before the Society the legs were of plain Honduras mahogany, a wood which he had always recommended for photographic purposes; but the wood which he would strongly advise for the construction of tripod stands was Norwegian or Baltic yellow deal.

The Chairman inquired how light metal bars would answer in place of wood for tripod stands?

Mr. Shadbolt replied that metal would cause a great deal more vibration.

A vote of thanks was then unanimously passed to Mr. Shadbolt for his paper, when he again resumed the chair.

Mr. G. W. Simpson exhibited some specimens of arrowroot-paper, presented to him by Herr Paul E. Liesegang, the editor of *Photographisches Archiv*, on his recent visit to London.

In the course of conversation which followed,

Mr. Hughes was led to make some observations on artificial ivory, which, he stated, had been known in the French market long before Mr. Mayall had patented it in this country. In operating with this material, by which he had obtained one of the best photographs he had ever seen, he had found, on developing and washing, that it curled like common glue. He did not clearly see his way commercially in following up this process.

Mr. Cramb, of Glasgow, observed that, although a picture on ivory could not be produced in the ordinary manner without the grain showing, not only in the white but the black portions, yet, by a slight modification, he had never experienced any difficulty in producing photographs on ivory.

Mr. Wall expressed his opinion that ivory lost its transparency, and was not to be compared with paper.

Mr. Dawson remarked that the greater part of the ivory introduced into this country was "fossil ivory," which must have been buried for thousands of years, and this might account for the differences observed in the colour and structure of recent ivory.

Mr. Mainwaring then exhibited some beautiful coloured photographs, illustrative of our most favourite flowers, representing gloxineas, dahlias, and bigonias.

The thanks of the meeting having been given to the Chairman, the Society adjourned till October 31st.

FROM THE SOCIETY OUT-OF-DOORS.

Oh! if you please, I am the society which has been turned out-of-doors. Turned out-of-doors! and in this weather too! when only twelve months old, by my own parents, without whom I had not been in existence! No other society has been so treated. What have I done to deserve this? The excuse has been utility. I have been told that I must become strong and healthy, and able not only to help myself but others; that if I don't work, and work well, there is no reason on earth why I shouldn't die, and be decently buried. Very well; if this be true, why don't you serve us all alike? why should I be selected, the youngest, and consequently the weakest? All I say is, if it's good for one it's good for all; turn them all out, then, for three months a-year. That's what I say.

There — that's off my mind! and now I'll send you a report of

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

LAST OUT-DOOR MEETING.

The Committee, which had only met on the previous Wednesday, selected for this meeting of Saturday, September 15th, Epping Forest. The rendezvous being appointed at "The Eagle," Snaresbrook, at 2.15 P.M.*

The locality is one well adapted for the purpose, the scenery being of a truly picturesque character, and the distance from London very short.

Some gentlemen had started at a very much earlier hour than that appointed, and the President was not able to reach "the scene of operations" until half-past three o'clock, but most of the members were present at the rendezvous. The number of cameras there were sadly too few, and various reasons were given for the fact: some alleging the uncertainty of the weather, others the difficulty of conveying the apparatus for their process—the wet; but Mr. H. raised a laugh by giving for *his* reason that he had to start from that spot for Brighton; and when asked if he were going there for pleasure, innocently replied, "Oh, no!—it is to fetch my wife."

The first views (very pretty sylvan bits) were taken in the road by the railway station, the others from spots farther in the forest, taking a road past the sheet of water in front of "The Eagle."

Messrs. Tear, Borchert, and Ackland were testing Messrs. Petschler and Mann's new process. Mr. Tear has since informed the Secretary that the five plates he had prepared turned out quite satisfactory as far as this process was concerned, developing evenly and without stains. They were soaked for about fifteen minutes in water after albumenising, and thoroughly washed under the full force of the tap. M. Borchert thinks success by this plan is greatly dependent upon the collodion's character, and found his best pictures by it were produced with the more porous collodion. Mr. Ackland's Petschler and Mann plates were the victims of a rather singular accident. During his absence from home the gardener had swept into some apertures left for ventilation at the bottom of his laboratory (which chances to be in the garden), leaves, gravel, &c. The decomposition of the vegetable matter generated foul air, which acted upon the plates while they were being prepared, just as the fumes of ammonia might have done, and so produced fogging.

Several plates prepared by the linseed process have since turned out "excellently well," especially some which were said to have received a perfect washing subsequent to the application of the linseed.

As the members of the Society passed along, laughing, chatting, and joking, a little army of photographers bearing tripod stands and cameras, no small wonder distended the eyes of passing rustics.

In all, nearly forty plates were exposed; but, had the day proved less unpromising, more than double that number would have received images. Several showers fell, and darkness came on so rapidly that all regretted both that this was their last out-door meeting and that an earlier hour had not been named for the rendezvous.

After rambling about the forest, focussing and exposing, discussing matters photographic, and displaying the best of good fellowship, the party adjourned to "The Eagle," and partook of a capital tea, discussing some excellent ham and eggs, with a relish which was in itself a very good proof of the wisdom of adopting such out-door meetings. After tea the meeting was resumed.

* The announcement of this meeting, it will be easily seen, could not have appeared in this Journal, as it would otherwise have done.

One of Mr. Skaife's "chromo-crystals" having been handed round, some discussion ensued in reference to the real value and importance of the "pistolgraph," the difficulty of focussing being chiefly dwelt upon. Some suggestions were also made with reference to Mr. Skaife's method of obtaining an instantaneous exposure, and in discussing an optical question involved. Some statements made by Sir David Brewster were combated. A very artistic little picture, taken with a telescope glass, was shown by Mr. Davis, together with some specimens of failures.

The Rev. Mr. Statham, the President, said he had been thinking over a matter which he desired to lay before the meeting. In the first, or one of the earlier numbers of the new German journal, some hints were found as to the advisability of publishing a general index of reference, by which photographic students might see at a glance what had been said or done in reference to any one subject, process, or other matter in connexion with the art. The special utility of such a work would be at once apparent to photographers, inasmuch as articles of value on the various branches and theories were so scattered, and the journals and magazines in which they were to be found were so numerous, and of so varied a character, that many valuable matters must necessarily lose much of their utility, and finally become lost altogether. Such a *Catalogue Raisonnè*, as it might be termed, would be of infinite service to our own Society, and to others. Photographic literature was now in its infancy, but it was rapidly growing, and that which was now practicable might in ten years time be out of the question. He (the President) thought the Society might take some steps in this direction; most or all of the societies had originated such works, and with reference to that of the Royal Geological Society he, as a member, could speak very highly indeed of its great importance and utility. Undigested knowledge in scattered morsels could not compare in power with knowledge properly systematised, arranged, and concentrated.

Mr. Wall warmly advocated the adoption of such a system, but feared it was a task of greater difficulty than it might appear. To compile such a work would demand no little time, labour, and expense. Now, the South London Society was very young, its exchequer very low, and the tasks already undertaken were at present, considering the means in hand, quite enough to occupy its time and attention; but, as Secretary, he would willingly try to aid in carrying out such a suggestion in any way he could. Perhaps, if he found it necessary, he might ask the members to elect another secretary, with whose co-operation and assistance it might be accomplished, not in reference to the past, but the future. He (Mr. Wall) would also suggest that a combination of subscribers from amongst the members of kindred associations might take up such a design by appointing a committee of their number for its management, and ensuring some respectable publisher against loss by its publication. He believed such a book would command a large and ready sale.

Mr. Hughes said he was glad this subject had been brought forward, although he feared there were many difficulties in the way of realising their Rev. President's suggestion. Such a work ought to have been one of the earliest tasks undertaken by the parent society. Its utility would unquestionably be very great, and its importance to the art-science itself equally so. Many valuable papers on photography had appeared in such pages as those of the *Athenæum*, *The Times*, the *Quarterly*, the *Chemist*, *Notes and Queries*, and many others, the existence of which might only be preserved to photographers and experimentalists by a good *Catalogue Raisonnè*. In the present rapidly advancing state of photographic literature it was more than probable that this task, now perhaps practicable, would soon become impossible. From every point of view the matter was important; and, perceiving that Mr. Wharton Simpson was present, he would hint that the matter was one well worthy his editorial consideration. A regularly organised system of chronicling the character and the whereabouts of all papers of sufficient importance would be very advantageous. He was happy to find the Society's officers took such an active interest in its affairs. There was, unfortunately, too strong a tendency in young societies generally to fill their executive departments with officers elected rather with a view to their eminence in rank, or high position in public estimation, than to ability and fitness for performing the duties of their office.

Mr. G. Wharton Simpson had a very high opinion of the President's suggestion, but feared it was far too comprehensive a subject to fall within the province or power of a journalist. With regard to the particular journal under his charge, however, a more complete, copious, and systematised index of the past volumes, such as would in fact form a *Catalogue Raisonnè*, would probably be issued upon the completion of the current volume.

The President wished to draw attention to a suggestion previously put forward in the Secretary's annual report. It was very desirable that a collection of works by standard photographic authorities should be established as a library of reference in connexion with this society. Copies of all important works were presented to our chartered societies, and, doubtless, such would soon be received from the liberality of photographic authors or publishers if an appeal were made in the Society's behalf.

Mr. Hughes thought libraries were seldom of much service when unconnected with local homes; but he should be glad if a collection of such works as Hardwich's Chemistry, Sutton's Dictionary, Robert Hunt's Works, and others of equal importance, could be procured. Desirous as the thing was, there were some difficulties in the way of its establishment. The books, however, might be issued to members, and returned to the librarian once a month, in which case they must be kept at the place of meeting.

Mr. Wall said he would undertake the duties of librarian until these duties grew too heavy for his leisure—of which, however, he had not too muchj ust now; and a box should be provided for the books when the books were provided for the box.

Mr. Davis said he would, by way of example and beginning, present the society with a copy of Hunt's *Researches on Light*.

Mr. G. Wharton Simpson would also present copies of two little works—*The Photographic Teacher*, and *Harmonious Colouring applied to Photography*. He would also place the name of the Society on the list for presentation copies of the *Photographic News*.

Mr. Hughes, speaking of a suggestion of the President's, in reference to getting up an album of photographic celebrities, said it was an old saying that the shoemaker's wife was always ill shod; and its meaning held good with photographers, for while albums of all sorts of celebrities had been got up, we had yet to originate one devoted to photographic celebrities. Poor Archer had gone, and Daguerre, but many of the art's best friends still remained, labouring in the cause for which they had done so much. There were Fox Talbot—with whose face how few photographers were familiar!—Sir John Herschel, Sir David Brewster, Professor Wheatstone, Claudet, Robert Hunt, Rev. J. B. Reade, Dr. Diamond, and many others. He would initiate the movement by giving a portrait of Mr. Reade, from whom he had recently had a sitting.

Mr. J. A. Cotton, on behalf of his firm, would be glad to photograph any of such celebrities who would favour him with a sitting for this purpose. He had done very little for the society in any shape at present, but hoped to do more in future.

Mr. Wharton Simpson would present a print from his negative of Mr. Sutton.

Mr. Wall would provide a portrait of Mr. G. Shadbolt.

Mr. J. A. Cotton said he thought another album might be got up as a register of the more unaccountable kind of photographic failures. The best way of recognising the particular character of failures in your own productions was to see them in those of others. Some failures were very puzzling to account for, and a collection of such, for reference, might tend to throw light upon their origin, or even some perfectly new facts in relation to the science or art.

Mr. G. Wharton Simpson thought Mr. Cotton's suggestion a very happy one; but it would be important that such failures should be most carefully described, and have all their attendant circumstances fully detailed, otherwise the collection would only tend to increase confusion.

Mr. Wall said in no case ought failures to be adopted for the proposed album until they had been laid before the Society at one of the monthly meetings, to be duly inspected, discussed, and ratified by the members present.

Mr. Hughes also hoped that the utmost strictness and care would be exercised in the choice of such failures, and in impartially criticising the description given of their origin, inasmuch as the Society would lend its authority to the work, and become responsible for its character.

Other remarks were tendered on the subject by those present, and several members pointed out in how many cases valuable results had arisen from supposed failures. Messrs. Petschler and Mann's discovery, he believed, arose from what might almost be termed a failure; and a long list of similar cases were instanced by Messrs. Hervè, Hughes, Simpson, and others.

In the course of the evening another suggestion was thrown out relative to the advantage of procuring stereoscopic photographs of all the more valuable novelties in the way of apparatus.

Three new members were elected, Mr. Roberts, Mr. Holles, and Mr. Deberskey.

Thanks were very heartily awarded to the chairman, on the motion of Mr. Hughes.

Mr. G. Wharton Simpson said they had been guilty of a sad omission at their annual meeting. Not only did this Society owe its origin to their Secretary, but its present healthy position was mainly due to that gentleman's untiring energy and disinterested exertions in its behalf. After working hard twelve months for them, expending some money, more time, and still more thought and effort, he had not received even a vote of thanks. He therefore begged to move, as the nearest approach to an *amende honorable* they could make, that such thanks be now awarded.

Mr. Herve having cordially seconded the motion,

A vote of thanks was then received by Mr. Wall, and the meeting shortly afterwards resumed its sitting in the railway carriage, passing, as the President said, over the sleepers as a wide-awake young society should, and progressing rapidly as we hope it may continue doing.

The following papers were announced for the next meeting, which will be held in the school-room beside St. Peter's Church Gates, on the 18th of October:—

On the Best Mode of adapting Portrait Lenses to Landscape Photography. By Mr. C. Jabez Hughes.

On the Photogenic Action of Colour. By Mr. T. Clarke.

The Secretary stated that steps having been taken for forming the proposed "Experimental Committee," one or two "Jottings" relative to

experiments of more or less value might be expected from the same at each of their future meetings, excepting, perhaps, the first of the session, although he trusted such committee might at once get into working order.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The first meeting of this Association, after the summer recess, was held at the Chorlton Town Hall, on the 12th ult.,—Mr. Griffiths in the chair.

The Secretary read the minutes of the last meeting; which were confirmed.

The Chairman then addressed the meeting as follows:—

Gentlemen,—On this our first meeting after the vacation, I should like, with your permission, before proceeding with the ordinary business of the evening, to make a few observations *On the Present Position of Photography, Viewed as an Art and Science Educator;* and also *On the Present Unsatisfactory State of our Knowledge with Reference to the Chemical Nature of the Various Changes Involved in the Production of the Photographic Image, together with a Short Account of the Working of some of the Negative Processes.*

The subject is so vast a one as to make it impossible for me, in the short time I dare venture to trespass on your patience, to do anything like that justice to it that I should wish; therefore I shall content myself with merely calling your attention to those points that appear to me to be of the greatest importance.

We have been highly favoured in our day, for we have lived to see the gradual development of three of the grandest discoveries that it was ever permitted man to make—the railway system, the electric telegraph, and photography.

By the operation of the two former, time and space may be said to have become almost annihilated; and by means of the latter we are enabled to hand down to posterity not merely dry verbal descriptions of persons, places, and scenes, as formerly, but faithful, speaking images, drawn by the unerring hand of Nature herself. No one, I think, will deny the immense benefit that has accrued to the human race from these discoveries; not only as aids to civilisation, by breaking down the barriers interposed to the free intercourse and interchange of thought and opinion between nations, but by supplying a fresh stimulus to scientific and chemical investigation.

The part played by photography in this great work may not appear at first sight so apparent to the casual observer, simply because its sphere of action is the human mind; and it is, consequently, only in the lapse of time—like all other influences, whether for good or evil, to which it is subject—that we must expect to see any decided and palpable effects of its operation.

Even now, although ten years have scarcely elapsed since the lamented Scott Archer freely made his discovery of the collodion process known to the world, its effects on the great mass of the people are becoming more and more apparent in the improved taste and love for art which is exhibited, not only by the middle and higher classes, but even by what are termed the uneducated classes of society. As a proof of this, I need only instance the vast and increasing number of amateurs from the lower walks of life who now practice the art, and who have, from being careless or indifferent observers of what is beautiful in nature and art, become enthusiastic admirers of all that tends to ennoble and elevate the human race.

It is in this way, I conceive, that photography may be safely considered as one of the great aids to the civilisation and improvement of mankind.

I may not, in confirmation, inappropriately refer to some of the commercial aspects of photography; to the thousands of our fellow-men who now find useful and profitable employment in its practice; and to the great stimulus it has given to optical and chemical discovery.

I should have a difficult task to perform were I even to attempt to name all the various uses to which it has, up to this time, been applied. I shall, therefore, merely allude to those which more particularly claim our attention.

Portraiture, being the first great practical use to which it was put, demands more than a passing observation. If we would know the estimation in which it is held, we have only to take a walk through some of the streets of our towns, noting down the number of galleries we everywhere see. There can be no greater proof than this that the services rendered by photography are highly appreciated by the great body of the people. Ask the husband who has lost a dear wife, the wife who has lost a husband, the father who has lost a child, what value they place upon the frail and delicate image which photography alone has enabled them to possess, and you will no longer have any doubt of the important position our art is entitled to.

Landscape photography, the next in order of usefulness, I shall pass over by observing that we are far yet from having obtained that perfection in it which portraiture has attained: partly from the nature and construction of our lenses, embracing, as they do, so much smaller an angle of view than the eye; and also because of the lengthened exposure we are obliged to give, consequent on the smallness of the aperture required for the sake of having all in good focus, during which time the aspect of the scene is constantly undergoing a change in the variations of its lights and shadows, the movement of trees, foliage, and living objects. A wide field for research is open to the enterprising experimentalist in this department, who should not rest satisfied until the improvement in his lenses is such as that the angle of view embraced by them shall more nearly approach that of the eye, and until he has made such improvements in the dry processes as to make them equal, at least, in rapidity and certainty to the wet collodion process. Both these objects, I am persuaded, can and will be ultimately attained.

The next great use to which it has been applied is that more immediately connected with trade and commerce—the copying of machinery, plans, maps, paintings, and numerous other objects. This department has attained an importance and a perfection almost equalling that of portraiture.

The last uses, though not the least important, to which it has been applied, and that I would call your attention to, are those connected with microscopical and astronomical science.

Its application to both these sciences promises well to be of the greatest benefit in their popularisation and advancement.

Having now, though very imperfectly, placed before you some of the facts and the reasons why photography must be considered a great art and science educator, I would specially call your attention to the second part of my subject—the Chemistry of Photography.

If this department had only received a tithe of the attention that the mechanical has, I should not have to regret that our knowledge is so meagre and our opinions respecting it so conflicting. Some few individuals, it is true, both in this country and in France, have specially devoted their energies to it, and our thanks are particularly due to them for the little knowledge we possess. But this is not sufficient. Besides, we have no right to expect that they will continue their investigations, involving, as it must to them, a great loss of time and money, and all for our benefit.

There is scarcely one amateur or professional who has not taxed his inventive powers to improve the manipulative and mechanical department of the art; and the consequence is, the comparatively high state of perfection they have now attained.

But the chemical department, though far outweighing the other in the importance of the results that may be expected to arise from a more general and energetic study of it, seems to be viewed by the majority of photographers with something like the aversion that the schoolboy looks upon the solution of some difficult geometrical problem. To show you the necessity for this department receiving a greater amount of attention and study, I have only to remind you of some of the as yet unexplained facts and phenomena connected with the collodion process alone. Take collodion itself. What amount of knowledge do we possess respecting the changes, chemically, which we all know it undergoes by long keeping? Why do we experience such great difficulty in obtaining it of uniform and unvarying quality, even from the same maker? Is it not mainly owing to the defective state of our knowledge as respects the preparation of pyroxyline? Cotton is a definite compound of carbon, hydrogen, and oxygen. Gun-cotton differs from it only in the substitution, atom for atom, of part of its hydrogen by peroxide of nitrogen; and it is according to the extent that this substitution has proceeded that we obtain so many varieties of it, each differing so greatly in its properties and suitability for photographic purposes.

A careful analysis of that variety which is found from experiment to answer all or most of our requirements, particularly with reference to the per-centage amount of peroxide of nitrogen it contains, would, it seems to me, be a great step in advance. Our next object then would be to ascertain by careful experiment the exact strengths of the mixed acids, and the temperature, as well as the time of immersion, necessary to produce that variety. To produce a definite chemical compound certain fixed and invariable conditions are necessary, and these once known and acted upon, we cannot fail in arriving at a successful result.

Some years ago Professor Hadow gave to the world the results of his experience in the shape of a formula for the production of a definite gun-cotton, suited to the manufacture of collodion; but, however strictly it may be followed, the result is not always perfectly satisfactory. More recently Professor Hardwich has taken up the subject experimentally, and has given us a formula which differs widely from that of Professor Hadow, but I cannot say that it produces better or even as good results. It is quite clear, then, that there is room for further experiment in this direction. We all know from experience that a collodion plate made sensitive in an alkaline bath produces a picture enveloped in fog; and that one excited in a neutral bath is more readily acted upon by light than it would be if excited in one that is acid. A satisfactory explanation of these facts has yet to be given. Our information is equally defective as to the part played by free acids in our developing solutions. Various theories have from time to time been put forth in which an attempt has been made to explain the precise nature of the action of light upon salts of silver; but further corroborative proofs are wanting before we can decide with certainty which of them, or if any, is the correct one. The future advancement of photography to the position of an exact science depends mainly upon this point being satisfactorily cleared up. That done, we should not be startled out of our propriety, as we occasionally are, by the announcement of some such extraordinary (because unexplained) facts or phenomena as the *reversed* action of light on an over-exposed plate; the gradual fading out of the invisible image on the dry plate when kept too long before development, as also its obliteration when exposed to the vapours of iodine, acetic or nitric acid;

the development in daylight of a collodio-albumen plate, after the removal of the iodide of silver; the non-sensitiveness of dry collodion, when a slight trace of any soluble chloride, iodide, or bromide is present, and the return of sensitiveness by simply washing it away.

I could point out to you, if it were necessary, a great number of other facts that require explanation; but I trust I have done sufficient to excite in you a determination to commence a course of careful experiments, with a view to clearing up some of the mysteries that beset our art.

I will now, lastly, say a few words on some of the numerous processes followed in the practice of landscape photography.

I have personally had a limited experience of the wet collodion, the oxymel, the gelatine, the gum, the collodio-albumen, the milk, and the simple dry collodion processes, and have succeeded in obtaining fair, though varying results from all. If I were asked to which I should award the palm, I should hesitate, as I believe them to be all equally good in the hands of a practised manipulator. Were it not for the great drawbacks to its successful working in the open air, I should feel inclined to give the preference to wet collodion—not so much from the beauty of its results, but simply from its rapidity and the satisfaction one feels at coming away from some favourite scene with negatives one can look at. It is more followed than perhaps some of you may be aware, particularly by professional photographers. The new process of Messrs. Petschler and Mann, called by them (although inaptly, as it is more nearly akin to the Fothergill) *a modification of the collodio-albumen process*, promises to become highly popular from the simplicity of the manipulation required. But far outstripping, to my mind, this, and all other dry collodion processes, is the *improved patent process of Dr. Hill Norris, of Birmingham.* I confess that, until lately, I have been somewhat sceptical about it; but, from results recently seen, I have no hesitation in saying that it is, as described, "fully equal in sensitiveness to wet collodion, without any of its attendant disadvantages."

Before I conclude, I feel it to be my duty to refer to the untiring energy our treasurer, Mr. Hooper, has always displayed in his efforts to improve the negative paper processes. We all know that paper negatives, apart from the long exposure they require, rarely equal in definition and sharpness, particularly in foliage and in distances, those on glass. This no doubt arises from two causes:—the want of uniformity that all paper presents, and the formation of the image in the body of it and not on the surface.

He has succeeded in producing a paper almost, if not quite, equalling in sensitiveness and sharpness the collodio-albumen process.

As he is himself present, I will leave him, as better qualified, to make any further remarks upon it.

I will not continue further to tax your already overstrained attention, but conclude by thanking you for the patience yon have shown in listening to my imperfect remarks.

Mr. Hooper then handed round to the members several specimens of negatives and transparent positives. He said they were prepared by coating the paper with plain albumen, coagulating it by immersion, or floating it on alcohol after drying, which was rapidly accomplished. He coated with iodised albumen, prepared by mixing as a formula—

Iodide of Potassium	25 grains,
Bromide of Potassium	3 grains,
Albumen	1 ounce,

well frothed, again coagulated and dried, sensitised on the nitrate of silver bath, washed in plenty of water, and hung up to dry. The formula was not perfect yet, although the specimens were on the whole better than he had expected; but he wished to make the Society acquainted with the results of his experiments. He had found it very successful in copying in the printing frame, but it was hardly as good in the camera as he wished; however, in his opinion it was sharper than waxed-paper. For printing positives it answered very well; and, from being so sensitive, they could be printed by gas-light in the evening, which he was sure would be an advantage to amateurs, enabling them to produce prints on paper after dark.

Mr. Wardley remarked that, if this process could be made to work for positives, it would be very useful to enable persons to print in dull weather or in the evenings, and by all means urged upon Mr. Hooper to go on and perfect it; but for his part, he hardly expected to find it better than *good* waxed-paper for negatives.

Mr. Adin should be disinclined to abandon the waxed-paper process for this: he did not care for such extreme sharpness. He had a positive which had been moved in the printing-frame probably to the extent of one-fiftieth of an inch: many had seen this print, but not one had detected the double image.

Mr. Wardley called attention to the now accomplished fact, that dry plates had been obtained by Dr. Hill Norris equal in rapidity to wet collodion in the camera. This was a great step in advance. Dr. Norris had patented the process, he understood. There was a long and animated discussion on the mode of gaining increased sensitiveness, and several members gave the mode of manipulation they employed; but none appeared to have any knowledge whereby they could produce plates so rapid as these appeared to be.

Mr. James Ward said he had great pleasure in reporting to the meeting that he had had great success with some plates he had prepared according to Messrs. Petschler and Mann's formula. He had exposed and developed several, and found them the best of any that he had yet tried.

It was resolved that the thanks of the meeting be given to the Chairman for his services, and for the address that he had delivered to the meeting.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VII. *(Continued.)*

ORNAMENTS, DRAPERY, ETC.—*Continued.*

White Satin.—French blue and ochre, with a touch of madder pink, forms the local wash; a little Indian yellow, ultramarine, and madder pink the half-tints; for lights, use white, with a very little blue and gum; and for the highest lights, strong full touches of thick perfectly pure white. As satin reflects the light, the tone, and colour of objects around very strongly, the shadows will display much variety of tint and depth. For the deeper shades use bistre, with a very small portion of French blue and madder pink. Having thus pointed out the pigments for the above, I need only remind the reader once again that further particulars on the subject of drapery may be found in Chapter VI. (No. 113).

Cloth is best treated with transparent and semi-transparent blacks, using body colour (white, black, and a little blue) for the high lights, and strengthening the deeper shadows with a little gum. In painting draperies your chief aim must always be to preserve the photograph. As a general rule warm shadows accompany cool lights: for instance, in painting blue drapery, use cobalt, or cobalt and white; for the high lights, French blue and lake for the shadows, and, for the deeper shades, madder brown.

Scarlet Cloth.—Commence this with a thin wash of carmine and cadmium carried over the whole; then use vermilion for the local colour; orange vermilion for the high lights; vermilion and lake for the half-tints; lake for the half-shadows; madder brown and carmine for the deeper shadows. To finish, work over the whole, excepting the deepest shadows, with the mixture of carmine and cadmium, thinly mixed with a very slight portion of gum.

CHAPTER VIII.

COLOURING IN OIL.

I know by letters received that some of my pupils have been anxiously looking forward to my promised instructions in painting photographs in oil. I hope I may be as explicit and useful as they desire me to be. I certainly think oil colours the more permanent when applied to photographs, and have good reason for believing that few water pigments remain long on such a surface without fading or changing more or less. With the most scrupulous care in choosing my pigments, and while conscientiously using none but colours of reputed permanence, I have found very few of my water-coloured photographs remain long in their original condition, and have found my own experience that of my professional friends also. The reader may have noticed the same fact in observing the specimens in water colours exhibited at the doors of photographic artists. I therefore recommend you to give attention to the lessons I am now about to commence.

It is frequently supposed that more skill and knowledge is required to colour in oil than in water; but, judging from the progress made by my own pupils in the one and the other, I think the idea altogether an erroneous one. A little may be done as easily in the one as in the other, and to do much will require about the same time, perseverance, and application. Oil colours are not, as is commonly supposed, more opaque than water, unless you use so little medium as to apply the colours on your surface with a most unnecessary and injurious degree of solidity and thickness. Before proceeding further it would be as well perhaps if I enter upon the explanations, &c., of a few terms, technically used by painters, in reference to oil painting.

GLAZING.

This is one of the most important of the oil painter's methods, inasmuch as effects are produced by glazing which cannot be emulated or equalled by any other process. It represents the most valuable feature in this branch of colouring. To glaze, you apply very thin films of transparent colours, for the purpose of modifying, altering, deepening, softening, or rendering more brilliant, as the case may be, colours already applied. By glazing you may render parts cool, or warm, strengthen or decrease effects, or soften and subdue

crude, hard masses of colour. Transparency can seldom be secured in a painting without its aid;—in its use it should be regarded more as a species of coloured varnish than anything else. The medium* with which you glaze should flow freely from the pencil, but not so freely as to spread beyond its intended limits; and the colours should be as transparent as possible, unless, as is sometimes the case, a glaze of semi-opaque colour is essential to the desired effect.

A glaze is best applied when the picture is just dry enough to prevent its being lost in the colours already on the surface: when the paint is too dry for glazing the colours will run off as water does from a greasy surface. When this is the case, the glazings will not prove so thoroughly permanent as they would if they formed a closer union with the colours beneath; but the glaze may be made to lie even and smooth, either by breathing on the picture, applying a little poppy oil and magilp, and then wiping it off, by using a few drops of alcohol with the colour, or by washing the part with a little alcohol and warm water. Glazing gives the whole picture a more natural, mellow, and subdued appearance, destroying in a great measure its painty effect. In glazing due attention must be given to the fact that the glazes are apt in time to assume a deeper and more yellowish tone than they have when first applied; some allowance should therefore be made for this fact in selecting your colours. For instance, in painting blues, they should partake rather of a purple tone than a greenish, because otherwise the oil in the pigment, turning yellow with time, must inevitably make the blue very green indeed, and so destroy your effect. For the same reason use as much varnish and as little oil as possible in glazing colours.

While urging upon your attention the really great importance and beauty of judiciously-applied glazings, you must yet understand that such are in a great measure dependent upon the painting over which they are placed, which should in its turn have been executed with due reference to their after application—the earlier colours being, with this view, lighter in tone and more opaque.

By way of hint, I may here add, that among the pictures of our great painters we find a judicious combination of solid and glazing colours best serve the purpose of permanency and lasting effect. For instance, Sir Joshua Reynolds, the beauty of whose flesh tints have been so enthusiastically praised, always depended upon his glazings. Sir Thomas Lawrence, on the contrary, seldom glazed at all. The changes undergone by the productions of both these painters are a common source of regret, while those of Vandyke, who combined "impasting" and glazing, are least affected by the test of time.

Some recent writers upon photographic colouring have, in their simplicity, argued that the photograph being perfect in light, shadow, and drawing, simple glazing would suffice to colour it. Without adverting to the thoroughly inartistic and unsatisfactory effect which would thus spoil a plain picture without making it a coloured one, I may tell you that such glazings would become discoloured and horny in a very few months.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

N. S.—The specimen is not a good subject to judge from; nor could I conscientiously hold out much hope of your ever becoming a professional photographic colourist. Try again, and let me see the result.

B, A. L.—The medium shall be tested, and the result announced if good.

* Or name given to the vehicle in which the colours are used.

Foreign Correspondence.

Paris, September 26, 1860.

Father Secchi, the director of the observatory of the Roman College, has just sent to the Academy of Sciences a new communication on the subject of the eclipse. I send it to you *in extenso*, because it throws into strong light the advantage of observations taken with the aid of photography, and at the same time refers to the labours of your fellow-countryman, Mr. Warren De la Rue. The Italian astronomer expresses himself thus:—

"I have little to add to what I have already indicated in foregoing communications; and, without repeating what I said in the first, I think it merely necessary to compare the photographs therein spoken of with those of Mr. De la Rue, taken near Miranda, at a station where the absolute instant of total obscurity preceded the arrival of the same phenomenon at the Desierto by about nine minutes of time. The only difference which exists is in the manner of counting the angles of position, which I reckoned from the apparent east to the apparent north, whereas Mr. De la Rue reckoned them from the true north to the true east. With this variation it will be found that *the positions* of the protuberances of our photographs are identical with those of Mr. De la Rue, except a slight difference of one or two degrees for those which are very small. This difference may be explained by the difficulty of taking angles in our little figures, which are but twenty-three millimètres in diameter, or possibly by a slight variation introduced at the moment of changing the camera, which perhaps was not fixed exactly to the mark that I had made on the tube of the glass. This little detail in nowise changes the fact of identity, and may have been produced by the change in the position of the moon relatively to the period of the local phase.

"I have fixed the first little photograph upon a sheet of white paper, and surrounded it with two graduations, according to the different manners of reckoning. In this manner the identity becomes apparent:—

Secchi	78°	113°	135°			198°	213°	242°	
De la Rue ...	197°	154°	135°	129°	111°	72°	57°	28°	348

"These are the only protuberances of which Mr. De la Rue gave a description in *The Times* of the 9th of August; and it will be seen from our photographs that he includes but the half of those which are noted down in our different pictures, and that in the third there appears others which are completely developed in the fourth and the fifth. The only essential difference I find between the micrometric angles and those deduced from the photograph is, that there is an error of 180° in two of them, due to my having taken the angle between the threads of the micrometer without turning the circle of position half round. I give the three series of angles thus rectified, and reckoned according to my method:—

"First photograph.—78°, 88°, 113°, from 135° to 148° a bright arc, 212°, 242°.

"Last photograph.—10°, 40°, 76°, 248°, 290°, 300°, from 350° to 306° a bright arc.

"Micrometric angle.—39°, 75°, 116°, 211°, 353°, 310°.

"It is clear, then, that if any observer saw fewer protuberances than I did the reason must be sought elsewhere. It is not improbable that it may be owing to some constitution of the eye, or rather to the great degree of attention given to one or two of the objects which causes us not to see the other. I can the more readily believe this, as a large protuberance (57° in Mr. De la Rue's reckoning, and 213° in mine), which was seen by so many observers, escaped my attention, occupied as I was in observing the others—113° and 135°.

"Thus, being much occupied with seeing the diffusion of light prevailing near the sun's edge, I did not observe these protuberances neither before or after the totality. I made fruitless efforts to see them in full sunlight; but I convinced myself that that would be impossible. I have almost a positive proof in the following fact:—Having one day, with M. Monserrat, taken an instantaneous photograph of the full sun, with a direct focus, merely opening and shutting the objective, we found the sun quite over-exposed, and the atmospheric region round the sun presenting a magnificent corona, tending to the same effect. We concluded from that that the light of the protuberances is at the utmost equal to that sent to us by the terrestrial atmosphere, illuminated by the full sun; consequently the protuberances would be invisible while the atmosphere is illuminated by the full sunlight.

"Although very small, the pictures show the double summit of Mr. De la Rue's protuberance of 28°, and the inclination of the protuberance of 57°, the great arc between 129° and 135°, &c. In fact, it appears to me proved that the objects photographed at Miranda and at the Desierto are evidently the same. This proves, also, what care should be employed on another occasion to take photographic pictures, but enlarged ones, for I am sure also that their printing would be very rapid.

"The principal deduction to be drawn from the photographs of the photographs of the partial phases (with a diameter of 106 millimètres) is the same that I was led to in 1851, namely, that the border is exceedingly feeble in comparison with the centre. One would say, on examining these pictures towards the sun's border, that the collodionised plate was not in the focus, so great is the diffuseness of the border; but the moon's edge is there, and shows that this diffuseness is not caused so, but by the real indecision of the sun.

"In several of these photographs there is the spot with its

penumbra well marked, and it is clearly seen that the sun's border is much less brilliant than even the penumbra of this spot. I hope soon to be able to send to the Academy some photographs of this kind. Thus these observations confirm the results which I have always maintained before the Academy for the last nine years, and which my thermometric labours upon the measurement of solar radiations had already put beyond a doubt. I have just made a comparison between the absorption of the terrestrial atmosphere obtained by observation and that given by the theory of Laplace, and I find that the theory does not represent the facts. I defer details to another occasion."

M. Zollner, following the indications given by M. Niepce de Saint Victor, has made some interesting experiments on the salts of uranium and on those of iron. By plunging a sheet of paper into a bath of pernitrate of uranium, and then spreading it upon a weak solution of starch, he has obtained, on contact with the sunlight, a picture which he fixes by simply washing. His studies on the salts of iron have led him to a photographic printing process, which is thus summed up:—A sheet of paper covered with starch is floated in the dark, during from thirty to sixty seconds, on a bath composed of—

Solution of perchloride of iron	1 part by measure.
Concentrated solution of peroxalate of iron	6 parts.
Distilled water	14 „

In drying, the paper takes a yellow colour. When completely dry it is placed in the pressure-frame. Three minutes' exposure to the light is more than sufficient. It is washed with a solution of iodide of potassium in albumen (two or three grammes of iodide to the white of three eggs), then washed copiously on both sides with common water, and dried between sheets of blotting-paper. During the washing the colour of the picture is observed to change from light brown to dark blue.

I see, from the interesting labours referred to in the late numbers of the BRITISH JOURNAL OF PHOTOGRAPHY, that the important question of "dry collodion" is still actively occupying attention in England, and that the processes recently made public by your investigators tend to the simplification of the methods hitherto known. This question has also for some time past been the object of serious study in France. You are acquainted with the process proposed by Mons. M. A. Gaudin. I have just received a letter from M. Vernier, in which, while he expresses a different opinion from that put forward by our able chemist, he agrees with him in deciding for the suppression of all preservative coatings. He recommends that the collodionised glass be left for at least four or six minutes in the first silver bath. He also advises that the glasses be submitted to a washing bath sufficiently acid to neutralise the fatty bodies, and to open the pores of the collodion. After exposure he plunges the plate into a second silver bath containing a twentieth of alcohol: in this it remains ten minutes at least. For developing he pours over the plate a solution of protosulphate of iron, to which has been added ether and alcohol at ten per cent. to facilitate imbibition. For this process to be fully successful, M. Vernier recommends that the collodion be powdery, short-fibred, and composed of ether and alcohol in equal proportions.

In a few days the French Society of Photography will resume its meeting; and shortly our amateurs and artists will be returning laden, I hope, with an abundant harvest of new works, and will supply me, I doubt not, with more important matters to communicate.

ERNEST LACAN.

New Books.

Ideal Views of the Primitive World, in its Geological and Palæontological Phases. By Dr. F. UNGER, of Vienna.

Edited by SAMUEL HIGHLEY, F.G.S., F.C.S., &c.

Late Lecturer on Medical Mineralogy at the St. George's School of Medicine, Grosvenor Place, London.

Illustrated by 17 Photographic Plates, from Drawings by J. KUWASSEG.

WE presume that, in the present day, few persons of education can be found who will question the superior advantages enjoyed by the students of our own time, in nearly every branch of instructional literature. Not only is the *art of teaching* recognised and understood as an important acquirement, but its rules are reduced to the exactness of a science. Amongst the many invaluable aids to the clear and comprehensive communications of knowledge we may certainly reckon that of pictorial illustration as one of the more useful kind, especially as it has within the last quarter of a century advanced in position from a scarce luxury to that of a civilised necessity, while its excellence has kept pace with its increased popularity, and in an inverse ratio to that of its cost.

There is, perhaps, no class of ideas more difficult for the uninitiated to realise by mere reading than the stupendous inductive discoveries of geological and palæontological science; and Dr. Unger has, in publishing his ideal views of the primitive world, conferred a boon, not only on the students in these sciences, but also on the general public, by offering instructive and pleasing materials for thought, divested of all "dryness," or compulsory acquirement of technicalities for their proper comprehension.

If Mr. Highley has played a more humble part in his capacity of translator, he has performed a no less useful one, so far as the British public are concerned, in placing before them a perfect transcript of the original work, though upon a smaller scale, and consequently at less cost—in which, by the aid of photography, every stroke and detail of the beautiful illustrations are faithfully pourtrayed; and thus the artist and his English admirers are brought, as it were, almost face to face. The photographic illustrations are from the *atelier* of Mr. Russell Sedgfield, whose name is a sufficient guarantee of excellence; and the subjects themselves, far from being the mere diagramatic sketches which we are apt to associate in our minds with geological illustrations, are, on the contrary, poetical, pictorial works of art of no mean order, pleasing even when viewed as isolated specimens, still more so when regarded as a series, and to which a perusal of the descriptive letterpress adds an additional charm.

Mr. Waterhouse Hawkins, we are informed, remodelled expressly for this work miniature copies of his "extinct animals," which form so prominent a feature in the grounds of the Crystal Palace at Sydenham, and a photograph of the same forms an appropriate frontispiece.

The following is a complete list of the photographs, of which there are seventeen, viz.:—

FRONTISPIECE—Restoration of the Extinct Animals of the Secondary Formation by Mr. Waterhouse Hawkins.

IDEAL VIEWS
of

I.	Transition Period	VIII.	Lias and Oolite Period.
I A.	Silurian Period.	IX.	Wealden Period.
B.	Devonian Period.	X.	Chalk Period.
II. & III.	Carboniferous Period.	XI.	Eocene Period.
IV.	Permian Period.	XII.	Miocene Period.
V.	Trias Period.	XIII.	Diluvium Period.
VI.	Muschelkalk Period.	XIV.	Alluvium Period.
VII.	Keuper Period.		

The work is of a convenient quarto size, well printed upon good paper, neatly bound, and forms an elegant ornament for the drawing-room table.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

FAULTS IN TONING.

To the EDITOR.

SIR,—In toning positive prints I frequently find that, although nearly the whole of the proof colours beautifully in a few minutes, there are patches upon which the toning-bath appears to make no impression for several hours; and I need scarcely say that by this time the positive is entirely spoiled. I now use M. Lyte's bath, but I have often had the same difficulty with others, and with various kinds of albumenised paper.

If you can suggest the cause and remedy you will very greatly oblige.

I am, yours, &c., AMATEUR.

P.S.—The enclosed scrap will illustrate my meaning.

[An explanation of your difficulty may probably appear in the series of articles now in course of publication in this Journal, by Mr. C. Jabez Hughes.

Provided that you immerse but one print at a time in your toning-bath we think that there can be no doubt that the fault lies with the albumen: if several prints be put in the same bath together, contact of the papers would prevent the proper action taking place. It strikes us as possible that the fault may be owing to a slight *greasiness* of surface in the part that remains uncoloured, which would prevent the actual contact of the gold solution until the paper had become thoroughly saturated. To test this point we would suggest that, on the next occasion when you perceive symptoms of its appearance, you should immediately remove the print from the solution, press it between blotting-paper, dry it thoroughly, and then, with a tuft of cotton wool dipped in ether, pass it over the part affected so as to remove any grease that may be present; after which it ought to tone readily, if our conjecture be well founded. —ED.]

A WORD FOR THE OLD TAUPENOT PROCESS.

To the EDITOR.

SIR,—I think any one who has tried all the modifications of the Taupenôt process, which are many and wonderful—namely, salting the plate; using common albumen, *vice* iodised ditto, in disgrace; sensitising

with water, &c.—must be charmed, indeed, when he returns to his first love—the old original process, as preached by Mr. Mudd. All these new lights appear to me to do away with the chief advantage of the old plan, namely, the power of cleaning the plate during development with a piece of cotton wool. Besides which the inventors of these wonders almost always confine themselves to *stereo. pictures*, generally transparencies, which they exhibit at the meetings of their societies, and they are pronounced "particularly clear and bright." Why don't they produce a dozen 11 × 9 negatives? That would be some proof of the excellence of their discovery. Stereo. negatives and positives prove very little; for it has been already shown by the ablest photographers of this town that raspberry syrup, or gin and water, are all that can be desired for that *small kind* of photography: the latter for choice. Of course, the sooner a quicker process is brought out the better; but, till that is so, don't let the old *top-knot* (as some people call it) be run down. A day or two since, after a total failure with six wet plates, I prepared a few "top-knots," which developed as clear and bright as a plate could do. I used the same bath and the same collodion as I had used a few minutes before for the wet process. People say—"How about the blisters?" If they will only keep their *collodion thin, and their room and glasses warm*, I will warrant them against that misfortune.—I am, yours, &c., H. M.

Manchester, September, 1860.

P.S.—I ought to have said that these plates were 11 × 9.

[We have seen many dozens of plates 10 × 8, by several of the modifications of the Fothergill process, which will not, however, bear the rough usage that may be applied to the original Taupenôt plates. But what objection has our correspondent to Messrs. Petschler and Mann's method? That will bear equally rough usage.—Ed.]

CHLORIDED ALBUMEN FOR FOTHERGILL'S PROCESS.

To the Editor.

Sir,—Permit me to recommend the disciples of Fothergill to employ *chlorided albumen* in the preparation of their plates; for by so doing they will obtain increased sensitiveness, clean, bright development, and satisfactory density in the skies. In my experiments I have used four grains chloride of sodium, four minims liq. ammonia, one ounce pure albumen, and three ounces distilled water. The final washing must be *thoroughly* done.—I am, yours, &c., ALEX. NICHOLSON.

[If our correspondent will turn to our last volume he will find that there is not the slightest novelty in his suggestion, and that the practice he recommends has been *in use* for upwards of twelve months. We insert his letter, however, as opening up a question again upon which our experience is diametrically opposed to his own in one particular. Some increase of sensitiveness takes place, but not much. The density of the result, however, has in our hands been enormously *reduced* when a chloride has been used in the albumen. We shall be glad to record the experience of other operators on this point, as it is one of considerable importance, especially now that we are likely to follow the lead of Messrs. Petschler and Mann.—Ed.]

FOTHERGILL PROCESS.

To the Editor.

Sir,—I wish you to look at the enclosed print, and tell me what is the fault with the negative. I am but a new beginner in the Fothergill process, and it is doubtful if I get a better picture than this. The way that I make the plates ready is the following:—I coat the plate with Keene's collodion, and let it stay in the bath from three to four minutes. I then take it out, let it drain, and wipe the back, and then I pour on at one corner about two ounces of common tap water; but I find great difficulty in getting it to flow all over. I then take the albumen (I make the albumen this way: one ounce white of egg to three ounces of water, two grains of phosphate of soda, and ten drops of liquor ammonia), and coat the plate with this, and run it round for about six times, and then place it in a dish of water, and agitate it for about a minute; place it in another dish of water, and leave it till I have coated a plate for the bath. I then shake the first plate about for at least one minute, take it out and rear it up for about half-an-hour, and then dry by the fire. The enclosed was exposed for six minutes in sunshine, and developed with two grains of pyrogallic to one ounce of water, one drachm of common acetic acid, and six drops of silver solution. My lens is fourteen-inch focus and half-inch stop—one of Ross's. I cannot get any body or density in the sky. The other parts are very fairly brought out; but, taking it all together, it is very weak. If you would oblige me with your opinion of the cause, I shall be greatly obliged. I have tried one of the collodio-albumen plates; but I think I wash too much in the first water, for I cannot get the slightest picture.—I am, yours, &c., JOHN WEST.

[The portion of the positive proof received is *very* badly printed; and, although the negative is evidently weak, it would unquestionably yield a better result if properly used. You would probably succeed better by developing more slowly with gallic instead of with pyrogallic acid, and no acetic acid. You should not use common, but distilled water for your first washing; and with a little dexterity you could cover the plate easily enough with two ounces. After the addition of the albumen allow it to remain in a horizontal position for about one minute, and then wash off by a stream of water under a tap: you cannot do this too copiously. We believe that your chief fault lies in too little development as far as the negative is concerned, and very inferior printing aggravates the failings. In the ordinary collodio-albumen process it is impossible to wash too much in the first water. You may even use uniodised collodion.—Ed.]

ANSWERS TO CORRESPONDENTS.

Robert Lane.—Not till November.

Carker.—The quantities given are quite correct.

Amateur (Lewes).—1. See note to letter from "Alex. Nicholson." 2. See our No. for 15th August last.

D.—See reply to "F. B." In what the trick consists we are not aware, but that it is a trick there can be no doubt.

R. S. P.—We should recommend a trial of Messrs. Petschler and Mann's process as admirably suited to your requirements.

B. C. A.—Moist oxide of silver, added gradually if too acid; dilute nitric acid in the same way, if alkaline.

Charles S.—See notice in the present number. For the other localities named, you should get them from Mr. Wilson, of Aberdeen.

John Warry.—We are pleased to learn that you have profited by the hints given. We have no doubt that practice will make you a good photographer.

Adolphus.—Mr. Ross will no doubt supply what you require. We do not agree in the notion that a gas stove requires no piping, and would on no account use one without.

E. Eastwood.—We are unable to inform you of any means by which you can mould carbon into cylinders for Bunsen's batteries. We believe that hydraulic pressure is required.

Green.—Get a bi-lens camera, decidedly, having a pair of good single lenses, which are less costly than portrait combinations, and will answer your present purpose as well or better.

A. G.—We do not think that there would be any danger to your *chemicals* by burning charcoal in your stove; but, without very careful ventilation, it would be highly injurious to your health.

C. D.—Focus on your *principal* object, whether it be near or distant: the others are only accessories, and therefore may be more appropriately sacrificed, if any sacrifice be needed. You may perhaps be able, by management, to "humour" the subject a little.

Messrs. Hope and Co.—Had our correspondents' communication been sent to the editor instead of to the publisher, agreeably with the standing notice below, it would have received attention in the present number. As it is, it has reached the editor too late, and must therefore remain over till our next.

G. M. Redaway.—We cannot reply to any but private friends except through the medium of the Journal: our work would never be ended if we were to do so. Consult a paper by Mr. Hughes, published in No. 113, page 61, of the current volume. Act upon that, or use Maxwell Lyte's toning bath.

F. Graham.—From your description we judge that your collodion is somewhat deficient in pyroxyline: add a little more, say one grain to each ounce, and try again. You need not increase the quantity of your iodiser, as you will find that a thicker film will cause a more creamy deposit of iodide of silver.

F. B.—1. We do not think that varnished negatives will be injured if kept in a deal box, provided it be dry. 2. You can dry your plates in an unvarnished tin box, and, provided the varnish be thoroughly dry, we do not perceive how any vapour could arise therefrom. 3. The advertisement to which you allude is, of course, a trick.

Anxious Artist.—Our conjecture was correct: we find that they are studies taken at Ryde. The same operator has also some others of a similar character that are, in our opinion, still finer than those you pointed out. Apply to him direct, stating for what you require them, and we have no doubt that you will obtain well-selected copies.

J. H. Slater.—The toning bath which your friend proposes would do the work well and quickly, no doubt,—but at what a cost! each print would cost you five shillings, at least, in toning! If you want to try another than that you now employ let it be Maxwell Lyte's, which you will find in Volume VI., page 67, of this Journal.

A. H. B.—If you will consult a paper by Mr. C. Jabez Hughes, in No. 113, page 61, of the present volume, and follow the instructions there given, you cannot fail to attain your object. Toning with the old hypo. bath is radically wrong in principle; and, with albumenised paper, fading is merely a question of time.

Nemo.—The difference consists in the fact, that in Messrs. Petschler and Mann's process the plate after being prepared is insensitive to light, but becomes sensitive by merely washing away the superfluous *chloride*; as the albumen has become coagulated by heat, that is *not* washed away at all. You would gain nothing in sensitiveness by the course you propose.

R. J——s.—Your enquiry betrays either gross ignorance or insolence. Can you point to any single instance in which we have awarded undeserved commendation? We may err in judgment, as no man is infallible; but at least you should have learnt, had you been in the habit of reading this Journal, that we never sacrifice independence, or truth, to interest. Your specimens are returned, and we decline any further communication.

W. Anderson.—We are unable to inform you of the composition of the fluid contained in one of Mr. Archer's fluid lenses: it is by no means improbable that filtering it would clean it. We have seen an advertisement occasionally put forth by somebody resident at Poplar, who acted as agent to Mrs. Archer, after her husband's death, and who was formerly employed by him we believe. It is possible that he would undertake to restore your lens.

C. B.—We consider that the *best* stove for a photographic room is one of Arnott's, in which anthracite coal is burned, as it requires filling but once a day, makes neither dust or smoke, and keeps at one uniform temperature. We see no objection to the long pipes passing through the dark room, if convenient. We are not acquainted with the merits or faults of the terra-cotta stove. We have seen a kind of gas stove that would be very applicable for the purpose of warming a photographer's room, but we question its economy.

R. T. D. (a Novice.)—The defect you are puzzled with is known by the term "measly spots," and arises from too weak a solution of hyposulphite of soda, or, what amounts to the same thing, a state of circumstances that prevents the immediate action of the solvent on the chloride of silver. You should not let the strength of your sensitising bath fall below 60 grains to the ounce of water, and do not let it be more than faintly acid. After removal from your toning bath wash in plain water, and do *not* immerse the proofs in the solution of hyposulphite of soda while saturated with moisture, but hang them up to drip, and when nearly surface dry, fix them. If immersed while very wet, even in a strong solution of hyposulphite of soda, the portion in immediate contact with the paper becomes much diluted—hence the fault complained of. You had much better not use the *sel d'or*, but get your photographic chemist to exchange it for an equivalent value of chloride of gold. One out of the three proofs received is very good.

⁂ Several correspondents who made inquiries some time back for stereographs of English lake scenery are referred to our notice of same in the present issue.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 128, Vol. VII.—OCTOBER 15, 1860.

If we ever had to exercise the office of a judge in sentencing a convicted literary culprit to adequate punishment, we should certainly prescribe an unrelenting course of compulsory reading in BLUE BOOKS. Of course it is scarcely necessary to state that we mean especially those issued by authority of the House of Commons. It is generally supposed that the designation "blue books," by which these publications are *distinguished,* is owing to the colour of the covers in which they invariably appear; but this must be a mistake, and we are satisfied that it arises rather from the condition of those who are obliged to peruse them (it cannot be that anyone but a lunatic would voluntarily do so)—an operation which inevitably induces a "fit of the blues." We assert this from experience. We have recently had an attack of the kind, which has only been brought to an issue by the storm of indignation which was raised within us after a careful perusal of the Report of the Committee of the South Kensington Museum, and the evidence upon which the Report is alleged to have been founded. For anything that we can perceive to the contrary, the report might just as well, indeed better, have been written without hearing the evidence; as in that case the discrepancy between the two would not have been apparent. We came to the inquiry in a perfectly dispassionate frame of mind. We have no personal interest in the question, either one way or other. We had formed no opinion upon its merits; and if a bias in either direction had found a place in our mind, it would probably rather have tended towards the side of the Department of Science and Art—partly on account of our feeling an inclination, like most other people, to be supplied with marvellously cheap copies of the works of the old masters, and partly because an indignity had been cast upon both the scientific and art aspects of photography by the principal antagonist of the "Department," in designating mere copying "one of its highest branches." Our appreciation of the attempted indignity we have already recorded at page 263, and we see no reason to alter the opinion then expressed; but we cannot allow the error of the advocate to prejudice our judgment of the case, to the investigation of which we have devoted a considerable amount of time and patience We have gradually and deliberately arrived at the conclusion that the authorities of the Department of Science and Art, at South Kensington, have been guilty of a great injustice, to seek to rectify which we can conscientiously affirm is well worthy the strenuous exertions of photographers in general. It is true that the number of individuals directly interested is but small in the present instance, but that does not affect the fact that injustice has been committed. What is the case of one class to-day may be that of another to-morrow. The thin end of the wedge has been inserted: let photographers bestir themselves or they may find the wedge driven home before they are aware of it.

In order that the following observations may be intelligible to our readers, we must beg the favour of their re-perusing Section 12 of the "Report," which we reproduced a few numbers back, as will be seen on reference to page 257 of the current volume. It will also probably be remembered that, about the middle of last year, an announcement was made relative to the intention of supplying the public at large with positive photographic copies of works of art, at certain rates, from the government establishment at South Kensington.

It is found that this announcement, though scarcely yet carried into effect, has seriously injured a commercial speculation of one professional photographic firm. It is feared, with just grounds, that others also will suffer; and, furthermore, there is no security that the existing interference with private enterprise may not be carried to a still further oppressive extent.

We will endeavour to put the case clearly and succinctly before our readers:—

1. It has been assumed that there exists an extensive demand on behalf of the public for cheap photographic copies of works of art, and that in order to promote art education this demand should not be checked.

2. Photographic reproductions from public collections at home and abroad having been made by the "Department" to furnish models for the use of the schools of art, it has been arranged to supply the general public also with positive copies at (what is alleged to be) *cost price.*

3. It is asserted that, owing to objections on behalf of the trustees of public collections, it is *impossible* for the public to procure photographic copies by the agency of private enterprise, and that *as there must be monopoly somewhere* it is better that it should be in the hands of a government body.

4. A parallel case is assumed to exist in the official publication of parliamentary papers.

There are several other minor points which it is not necessary to particularise at present, but which will be noticed incidentally as we proceed with the argument.

In the first of these four propositions we fully concur—we have not a word to say against it; but, with respect to the other three, we entirely deny their policy or soundness, and affirm that they are in direct contradiction to the weight of evidence published with the "Report" itself.

There is an extensive demand for cheap photographs of a particular kind, which demand it is highly desirable should be supplied. The same may be correctly said of cheap bread, meat, and clothing. It is regarded as injurious and unjust for the government authorities to attempt to interfere with private enterprise in supplying the three last-named articles. In what respect does the other one differ? The reply is the third proposition above given. But, on reference to the evidence, we find that this reply is quite untenable.

It is proved that Signor Caldesi did obtain permission to photograph the Cartoons of Raffaelle at Hampton Court before any similar application to the Board of Works was made by the South Kensington authorities; and, furthermore, that he succeeded in maintaining his right to avail himself of the permission *in spite of the most determined opposition* on the part of the "Department."

It is proved, by the evidence of Mr. Fenton, that permission to photograph in the British Museum was readily accorded to competent operators — *until, by the interference of the "Department of Science and Art*," such permission was withdrawn.

It is proved, by the evidence of Mr. Scott, that permission has been granted to his firm to photograph pictures in the Royal Collection, which Mr. Redgrave declares has been granted *exclusively* to the official photographer of the "Department."

What do we find, then? That the difficulties existing are only such as have been interposed by the "Department" itself, which then quietly asserts that it is *impossible* for private individuals to procure the requisite facilities!

It is generally held that it is next to impossible to prove a negative, yet the "Report" attributes the execution of this clever feat to Mr. Redgrave; for we find it stated that "Mr. Redgrave proved that Messrs. Caldesi & Co. would have been unable to have produced any satisfactory photographs unless the Department had permitted them to have the benefit (?) of the removal of the Cartoons by their [its ?] officer."

Irrespective of the ambiguity of the adjective "satisfactory" there is in the above paragraph an assertion in direct contradiction to the evidence. Mr. Redgrave holds a double office, as he himself pointed out, viz., that of Surveyor of Crown Pictures, as well as being an officer of the Department of Science and Art; and it was in the former capacity that he superintended the removal of the Cartoons in obedience to a mandate from the First Commissioner of Works, in compliance with a promise given by that minister to Signor Caldesi: therefore the compiler of the "Report" has committed an error of no little importance (to call it by no harsher name) in stating that the officer of the Department, "as such," had anything to do with the removal of the pictures.

Passing by, for the moment, the question of the justice of supplying the public with positive copies at *cost price*, we would draw attention to the fact, that the amount paid simply for materials and labour for the positive only is *not cost price*, nothing being charged for the negatives, either as regards materials, labour, plant for producing them, or rent of premises; and we have no hesitation in asserting that the scale of prices published is unquestionably below the cost, especially as respects large pictures. What can be more absurd than to make a fixed rate at per twenty square inches of surface without reference to the dimensions? Every practical operator is aware that there are comparatively but few sheets of paper fit for large work, in consequence of flaws and specks of various kinds, though, for small work, the defects can be avoided by judiciously cutting up the sheet. This is, however, nothing in comparison with the extra labour demanded in manipulating large sheets and extra risk of damage to them; for a large sheet of paper, when saturated with moisture, requires very careful handling to avoid its being torn, even by its own weight, and consequently more time and skill than is sufficient for the same quantity of surface in small pieces.

While on this part of our subject, we cannot forbear remarking upon another statement in the "Report" which betrays the most extraordinary ignorance of commercial matters in the compiler. We quote the passage to which we allude, viz.—"That, as the sale of the Cartoons by the Department cannot yet be said to be in operation, the apprehension of being undersold is at least premature." And this in the face of the fact that the *scale of prices* at which the "Department" undertakes to supply copies was published as long back as the month of May, 1859, the prices being professedly only cost prices, but in reality much below cost! To our intelligent readers further comment on this point is needless.

In the evidence of Mr. Redgrave much stress is laid on the fact that the Government photographer is bound to produce for the public negatives of any object in the collections at South Kensington and the British Museum at the fixed rate of threepence per square inch, and argues that it would be, consequently, quite unnecessary for private operators to take negatives, even if they had ready access to the originals for that purpose. It is not very likely that any photographer of eminence would publish proofs from a negative obtained in the manner suggested; but, even if there were no scruple on that point, what security would he have that the "Department" would not immediately have another and possibly superior negative taken of the same object, from which copies might be supplied to the public *at cost price*, and thus the private dealer would be undersold, even if the real, and not the assumed, cost price were that charged?

It is nothing to the purpose that the present official photographer is a gentleman whose integrity is above suspicion: he is bound to obey the behests of his employer.

A parallel case is assumed between the sale of photographs and the sale of parliamentary papers; but the slightest examination of the subject exposes the sophistry of such argument. The former are eagerly sought for as matters of luxury — the latter are only in demand in consequence of a stern necessity. The copyright of parliamentary papers is vested in the government; but, if we are not mistaken, absolute freedom is granted to anyone to reprint the whole or any part of the documents coming under this designation. They must of necessity be printed for the use of members, and as no private printer would think of producing them, because they would be unremunerative, no injury is inflicted on the trade by their sale.

It is argued, in justification of the sale of photographs at cost price by the South Kensington authorities, that it is not right to surcharge the public for *the use of its own property;* but, in the same breath, it is enunciated that a portion of this same public should *not* be allowed the free use of its own property in photographing it! Surely the same fountain is putting forth sweet water and bitter.

This same pretended care for the public is a most plausible pretext, but it is in fact very unfair. What though those interested in the sale of photographs do suffer by making the South Kensington Museum a commercial establishment in competition with them, at which the products are sold at cost of labour and materials, without any charge for rent, implements, and profit? Does not the public supply all these, and ought it not to receive the benefit? Truly, the public does supply these; that is, the whole public — professional photographers included—and that by compulsion. But the whole public does *not* receive the benefit of the low prices, nor anything like the whole, not even a majority, but simply a very small fraction of the whole. Why, then, should all be taxed for the exclusive benefit of the few? but, especially, why should photographers be constrained to contribute funds for the destruction of their own business?

This turning of a government department into a mere trading establishment is a monstrous evil, and should not be tolerated for one moment. By leaving the matter unheeded because photographic publishers are few in number we allow a most vicious principle to become established as a precedent; and, sooner or later, others besides photographers will surely suffer for it. We counsel those who are more immediately interested in the matter at once to prepare a memorial on the subject, addressed to the Lords of Her Majesty's Treasury, who, we believe, have the power of putting an immediate stop to the proceeding. We have little doubt that such a memorial would be speedily and numerously signed, not only by photographers, but by others; for though we all like to obtain cheap works of art, let us hope that the majority amongst us like justice better.

It must not be forgotten that, in the first instance, the "Department" sought for and obtained permission to copy the Cartoons *solely* for the use of the art schools in connexion with it; and that it is by no means clear that if the intention of competing with private enterprise in supplying the public had been known to the First Commissioner of Works at the time of

the application for permission to take the photographic copies—it is not very clear, we assert, that any permission would have been granted. This may or may not have been the case, but at any rate we find no record of any sanction having been sought for this public trading proceeding.

We have, however, no idea that an abrupt termination to the trading eccentricities of the Department of Science and Art, need in any way interfere with the public in obtaining photographic copies of works of art at reasonably moderate rates, nor that any special difficulty exists in making regulations for private photographers having access to the pictures in public collections without any greater inconvenience than is experienced under the system at present in operation. We suggest the following outline of a plan that we believe would be found to work satisfactorily:—

Let us presume that application is made for permission to copy one of the pictures in the National Collection. Let the application be of necessity accompanied by an undertaking to supply the public with copies at such maximum rate as the applicant may think sufficiently remunerative for his undertaking. Before granting the permission sought let a public notice be issued, by advertisement or otherwise, announcing all the particulars of the intended scheme, *except name and price*, and appointing a certain day on which tenders would be received from others to execute the same undertaking. Should there be no other applicants, or none offering to fulfil the conditions on terms materially lower than the first proposers, then the originators of the idea to obtain the privilege; but if there be others undertaking to perform the same work on considerably better terms for the public, the original applicants to be offered the option of accepting the lower terms, in consideration of their having first started the idea, and if declined, then those who offered the lowest terms to obtain the privilege. Security might be required for the due performance of the contract in either case, as well as for repayment to the government of all expenses incurred in performing the operation of photographing.

If some such scheme as that we have sketched were put in force we believe that the public would obtain such copies as might be in demand at fair and reasonable rates. If any demand existed, it would pay photographers to supply it: if under such a system it would not pay, we think it would only be just to conclude that the demand did not exist. It may be noticed that we have proposed no provision for testing the competency of parties applying. We have purposely omitted it as an entirely needless precaution. No copy could be taken without incurring much labour and expense, and, consequently, nobody would be likely to undertake it without a reasonable expectation of fair remuneration; and this of itself involves the requisite skill.

We have discussed this question at some considerable length, because we believe it to be one of serious importance to the photographic profession—not affecting the art and science of photography, but its application, which is a very different affair. It is a question which must sooner or later interfere materially with the commercial branch of photography; and it is our firm conviction that, unless an immediate and determined opposition be at once set on foot against the practice that has been so unwarrantably organised, photographers will, ere long, see cause seriously to deplore their want of energy and foresight.

We regret to notice that we are about to lose the services of Mr. Edward Mann as Honorary Secretary to the Manchester Photographic Society, an office which he has very ably filled during the past two years. Indeed all our readers will, we are convinced, cordially join in the vote of thanks which has been accorded to him by the members of the society, of which he has proved himself a most useful officer,—as they (our readers) have participated largely in the result of his labours.

Our regret at Mr Mann's retirement is, however, somewhat balanced by the pleasure we feel in finding that as a successor he is to be replaced by Mr. W. T. Mabley, an enthusiastic photographer and a careful observer—a gentleman whose name will be familiar to our readers as the author of an excellent article, published a short time back, *On the Theory of Positive Printing*. It has been sarcastically observed, that gratitude is an expression of expectation of favours yet to come. Certainly Mr. Mabley has already earned the *gratitude* of photographers, both in the direct and in the perverted meaning of the word.

KNAVERY.

There is a very apt saying—"Hypocrisy is the homage that vice pays to virtue;" and another—"Imitation is the sincerest flattery." The counterfeit bank-note affords testimony to the value of the real one, though the method of so doing is by no means commendable: in like manner the spurious manufacture testifies to the excellence of the genuine article.

We have been led to these remarks by a communication just received from Mr. Ross, the celebrated optician, by which we learn that his well-earned reputation is in danger of suffering severely from the nefarious proceedings of some unscrupulous individual, who it appears has been putting into circulation some spurious and worthless photographic lenses to which the name of the late Mr. Andrew Ross has been attached. We assert that Mr. T. Ross (the son) is threatened with damage to his reputation by this proceeding, because it is notorious that the production of photographic lenses was entirely under his superintendence during the lifetime of his father; and it is questionable whether any were ever issued from the establishment without passing through the hands of Mr. Thomas Ross. The discovery of the fraud arose in consequence of a lens, purporting to be of Mr. Ross's manufacture, having been offered at a pawnbroker's shop for the purpose of raising money thereon. The shopkeeper, knowing the commercial value attached to these instruments, applied to Mr. Ross to ascertain whether the lens which had been offered was genuine or not. Of course the fraud was instantly detected. We are informed also that several instances of the forged name having been applied to worthless lenses have come to light.

Under these circumstances, Mr. Ross has taken a very judicious step, although it will probably entail upon him a considerable amount of unremunerated labour—no less than that of undertaking to examine for verification *any lens* purporting to have been constructed at his establishment, whether purchased there directly or not. This will be a great boon to many who may be in possession of a "Ross" that has come into their hands indirectly, and we strongly advise all so situated to take advantage of the liberal offer.

While on the subject of fraud in connexion with photography, we solicit the attention of our professional friends to the following letter:—

CAUTION TO PHOTOGRAPHIC DEALERS, &c.

To the Editor.

Sir,—Some three or four months since a person calling himself *Professor* Kastner paid me a visit, showing me a printed circular signed by several gentlemen at Portsmouth, also photographs by Mr. Rejlander, which he stated he was selling for him, and photographs which were printed for him by Mr. Bedford. He wished to have a quantity of photographs of mine from the Dresden Gallery, and which, with the others he had, he said he could sell any quantity of. Believing his statements to be correct, I let him have nearly five pounds' worth. He went to Exeter, and wrote for over one hundred more. In the meantime I wrote to Mr. Bedford, and found he was indebted to him about ten pounds, which he was doubtful of receiving. Having sent several letters to him they were returned to me from Exeter, where, I found, after receiving the photographs from me he left, paying for three weeks' lodging six shillings only, promising to return in a couple of days. Thinking he might be serving others in the same way, I wrote to Mr. Rejlander, whose reply was:—"He has done me by false representations, &c., in a similar way." I then wrote to one of the gentlemen named in his circular, Mr. Thomas Vickery, Hope House Academy, Southsea, who stated, in reply, that he was for eighteen months a teacher in his school, but in April last he drew his quarter's salary in advance—fifteen pounds—and left in a few days; that he never expected to get it again; and also that Professor Kastner was *wanted* by others at Portsmouth. Mr. Wood, of the Abbey Hotel, in this

city, also informs me that he stated to him he was travelling for me, and he allowed him to run up a bill for one pound twelve shillings. On the Saturday, when he was absent, he went away, saying he should come back on the Monday, which I need hardly say he has not done, or remitted his account. I should not have written to you had this been a matter concerning myself; but finding he has been playing others the same trick, and doubtless is doing so in some other part, I think it quite time his "*little game*" was put a stop to; and I trust this will prevent any one else being served in a similar way. The said Professor Kastner is about five feet ten inches high, stout, and very restless in his movements.
—I am, yours, &c., HORATIO N. KING.

Photographic Depôt, 42½, *Milsom Street, Bath.*

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 13.

The discovery of Messrs. Petschler and Mann has now been before the public for several weeks, and we, in common with many others, have made trial of the modified process which they suggest. In describing the results of our experiments we shall presume the reader to be already acquainted with the contents of the paper recently read before the Manchester Society, and also with the discussion which followed it.

The first point to be ascertained was, how much of the albumen remained upon the film of iodide after the second washing.—Our theoretical anticipations were that the washing would remove the whole or the greater part of the albumen, inasmuch as the nitrate of silver solution ordinarily used for coagulating is omitted in the new method. Artificial heat was indeed spoken of as a means of producing coagulation of the albumen; but we think that it would not be prudent to place too much dependence upon heat applied by simply holding the plate to the fire, since it is difficult so to regulate the temperature as to ensure the coagulation. The plan we usually follow in dry collodion experiments is to rear the plates around the sides of a covered box, and to put a hot iron in the centre. In this way the glasses become warm, but never more so than the hand can easily bear. Messrs. Petschler and Mann's plates were therefore treated in that way, and subsequently washed in water until nothing further appeared to be extracted. The washing waters, when tested, were found to contain albumen; and an examination of the film appeared to show that it had lost a part, but not the whole, of its surface coating. The following simple plan is the one on which we now rely in testing the quantity of organic preservative left upon a film, and we shall be glad to hear whether some of "the old hands" in the dry methods have observed the same phenomenon:—Take a rather firm and contractile bromo-iodide collodion, and coat with the preservative after sensitising and washing. The resulting film, rather creamy whilst wet, becomes paler and more opaline on drying. Now, wet it a second time with water, and, if the organic preservative be abundant, it will regain its creaminess; but if it be deficient, it will remain blue. Thus a plate preserved by Norris's method will return to its original colour on wetting, whilst a Fothergill plate will not do so.

Having selected, therefore, one of the dried Petschler plates in the first stage of its preparation, we moistened it with water, and observed that the albumen expanded and the opacity of the film increased. After abundant washing, however, and a second desiccation of the plate, wetting with water produced comparatively little expansion or difference in colour. From this we inferred that the porosity of the collodion had not been fully maintained, but that it had contracted on drying, and would not again swell up as at first.

If the whole of the albumen does not remain upon the plate after the second washing in Messrs. Petschler and Mann's method, we must not expect that the developer will penetrate sufficiently to produce a very rapid action, nor that the negatives will bear as much cleaning with cotton wool as in the old Taupenot process.

The second point for consideration was, how far the plates are insensitive to light whilst the salt remains upon their surface.—We find that they are so far deficient in sensitiveness that they cannot be used for taking pictures in the camera, but that the operator must not presume to expose the plates to diffused daylight. In examining the films in this particular we determined to make the test as severe as possible, and therefore selected an old bromo-iodised collodion known to yield very intense images in the dry processes. A collodion of that kind, in passing through the bath, forms not only iodide and bromide of silver, but also, without doubt, some organic compound of silver in small quantity. To prevent a strong light from impressing such a film would therefore be more difficult than if organic combinations were absent. On twice trying the experiment we did not find that an excess of chloride of sodium had sufficient power to suspend the actinic effect under these circumstances; for the picture was fogged and imperfect in both cases, when the plate had seen the light in its early stage. It is possible that if, after having exposed the salted plate to diffused daylight, we had put it away for a time in the dark, the excess of chloride of sodium might gradually have discharged the latent impression. This, however, we omitted to do: the plate was washed and re-dried immediately after the first exposure, and a foggy camera-picture was the result. Alkaline chlorides are undoubtedly less active than alkaline iodides in discharging latent images. Some time since, whilst drawing up our report of M. Poitevin's method of producing transmitted positives, we found that, although a dilute solution of iodide of potassium, assisted by white light, instantly obliterated an actinic impression on the collodio-iodide of silver, a dilute solution of chloride of sodium did not do so. On removing the base, however, and employing free hydrochloric acid, instead of an alkaline chloride, the latent image at once disappeared.

Supposing we allow that the plates of Messrs. Petschler and Mann are not always absolutely insensitive in their first stage, yet we cannot but suppose that they are in a highly favourable condition for long keeping. The operator may prepare any quantity and take them with him on his journey, keeping the lid of the box closed as a precautionary measure.

The point which stands third and last for discussion is, the quality of negative which these plates yield.—Our impression at the present time is, that the negatives are all that can be desired, if the collodion be of the right kind; but that their quality will vary with the collodion more than in the old process of Taupenot. This we find, by experiment, to be the case; for, taking bromo-iodised collodion, as we have described it in this Journal, and working with it the day after iodising, we obtained an image rather wanting in contrast, and too grey and metallic in colour; yet, with the same kind of collodion, four months old, the depth and brilliancy of the negatives were very decided. It can scarcely be expected that a process in which the albumen is not coagulated by nitrate of silver can give the same security for intense development as the old Taupenot process, and hence more attention must be paid to the condition of the collodion. As regards the *sensitiveness* of the Petschler film we find no cause for complaint, since the shadows of the picture were well rendered by times of exposure certainly not greater, and perhaps somewhat less, than we are in the habit of giving for the Taupenot process.

To secure a second string to one's bow is proverbially useful, and the more the operator understands of the science the better will he be able to practise the art of photography. We are greatly indebted to Messrs. Petschler and Mann for showing us that when our aceto-nitrate bath gets out of order, and produces floating scum, marbled stains, or muddiness of development, we can for a time assert our independence, and set it aside altogether.

P.S.—Since writing the above we have prepared a Petschler plate with recently-mixed bromo-iodised collodion, and exposed it for twenty seconds to the diffused light of a room, the chloride of sodium being still in the film. In this case there was no action, and the camera-picture subsequently taken on the washed plate was free from fogging, although rather deficient in intensity.

ON A MODIFICATION OF THE COLLODIO-ALBUMEN PROCESS

By John Parry.

[Read at a Meeting of the Manchester Photographic Society, October 3, 1860.]

At our last meeting I read a short paper *On the Action of the Aceto-Nitrate Bath*, in which I endeavoured to show that its only use was the coagulation of the albumen on collodio-albumen plates. Since then I have pursued the subject a little further, and find that all we require is the coagulation of the albumen by the most convenient means. Pictures may be taken by coating the washed and sensitised collodion with gum, gelatine, &c., after removal from the usual thirty-grain bath; but all these processes have a tendency to blister more or less. The method I find to answer best is by simple immersion in hot water after the application of the albumen.

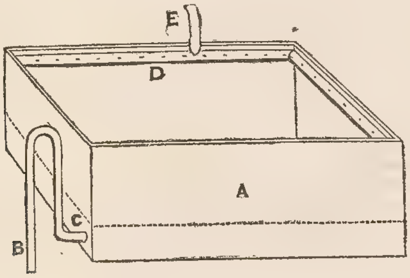
The plan I adopt is as follows:—I coat the plate in the usual manner with collodion; sensitise and wash, first in a large dish and afterwards under a tap; allow it to drain a minute or two, and

afterwards float over a solution of uniodised albumen, say one ounce of albumen to one ounce of water, and after draining a short time, but before it has time to set, immerse in a suitable vessel of very hot water, say for half a minute; dry the back of the plate with sponge, and set in a dark place to dry, when the plate is ready for use.

The conveniences of the above plan I find to be cleanliness of development and entire freedom from blisters.

NEW WASHING APPARATUS.

As I fancy the manner in which I wash my prints is better than many of the methods ordinarily adopted, and as it has been adopted by many of my practical photographic friends, I send a description of it for your pages, thinking that any information on a subject so important as washing proofs effectually would be welcome, particularly as the cost of this plan is at most a mere trifle, and, as it will be self-regulating, there is no danger of an overflow. The annexed drawing will serve to show the construction. It is an ordinary washing box, of any dimensions which may be most convenient, with a siphon attachment, which acts immediately on the water reaching the level of the top bend of the pipe; care should be taken to have the overflow or siphon of capacity to run the water off very fast, at least four times as fast as the feed—which may be done by increasing its size. A false bottom should be placed inside, slanting to the hole, that the deposit of dirt from the water or other matter may be drawn off; a network raised one inch from the bottom is indispensable, to keep the prints from getting into the pipe.



A, box of ordinary kind; B, siphon which is entered up through the bottom of the box at the corner C, and on which is a broad flange of lead, which is firmly tacked with copper nails to the bottom of the box; the siphon B is then carried up inside to be out of the way, to within about one inch of the top, then down as far as it may be desirable—it must be below the level of C; D is the feed pipe, the water coming in through pipe E and through D carried all round on the inside of the box, and perforated with small brad-awl holes. The water may be allowed to run in as fast or slow as may be wished—it matters not. The operation must be evident: as soon as the box A fills with water on a line level with the top bend of siphon B it must run out, and will in a few moments empty the box, leaving the prints lying on the network; the water running in all the while through pipe D, they soon float again, the box fills and again empties, and so on as long as the water runs. By this plan the water changes every ten minutes or every half hour, depending on supply, and changes thoroughly, no more water being used than in the old surface overflow style of box. This may not be new, but I fancy it is; however, it works to a charm. H.

ON IODIDE OF SILVER.

By Dr. J. Schnauss.

All who are sufficiently acquainted with chemistry and photography know that the former, notwithstanding its delicate apparatus and reagents, has not yet arrived at that stage of perfection in which it can satisfactorily explain every kind of photo-chemical process.

In this respect the observer will involuntarily remark an analogy between these processes and the combinations and decompositions that take place in the living organism of the animal and vegetable kingdoms.

The most deserving of notice is the still mysterious process for producing the *latent* photographic image. The principal source of this image, as is well known, is the film of iodide of silver, in combination with greater or less quantity of nitrate of silver. The complete washing off the nitrate of silver solution from the plate in the dry-collodion process is no exception to this rule; for it is impossible to neutralise the action of the iodide by washing it with clean water only. Here we arrive at a point which deserves to be mentioned in the annals of chemistry. It is this:—Photo-chemical researches long ago proved that there are two modifications of iodide of silver—one being sensitive to the light, the other quite insensitive; and there are also many other physical differences between the two kinds. In my researches on these modifications I proceeded in the following manner:—

I dissolved a given quantity of pure nitrate of silver in distilled water, and divided the solution into two equal parts, then added to each an equivalent of iodide of potassium dissolved in water. To one portion I then added a little more nitrate of silver, and to the other a little more iodide of potassium, and stirred the mixture well together. This operation, as well as the following experiments, were carried on out of the influence of daylight.

A remarkable difference was immediately discernable between the two deposits of iodide of silver. The one acted upon by nitrate of silver very quickly settled to the bottom of the glass vessel, and was of a beautiful light lemon colour; the other, treated with iodide of potassium, was a very bulky precipitate, increasing nearly three times in bulk during the process of washing, and nearly white in colour.

Both precipitates were repeatedly washed with distilled water, until a filtered portion of the washing was no longer clouded either by a solution of common salt or of nitrate of silver. This external difference between the two precipitates was permanent. I next exposed a portion of both to the influence of the solar rays. In a very short time the iodide of silver precipitated with the nitrate of silver changed to a brownish hue, while the other retained its yellowish white colour quite unchanged.

To distinguish these two modifications of iodide of silver, we will call that one which proved sensitive to light the + iodide of silver, and the other — iodide of silver.

Both were then submitted to the action of sulphate of iron, but they both remained unchanged, even the + iodide of silver did not assume a darker colour; but the addition of a few drops of nitrate of silver caused both modifications to turn black. Two other samples of iodide of silver, exposed to the light, and placed in contact with a solution of nitrate of silver, turned both grey.

From this it would naturally be supposed that an optical image thrown in the camera upon a film of — iodide of silver, and the collodioned plate then again dipped into the nitrate bath, would become visible under the action of the developer; but such is not the case.

I then made the following experiments:—

1. A sensitised collodion-plate was washed, upon one-half of its surface a dilute solution of iodide of potassium was poured, and the plate then washed again, taking care that the water did not flow off the iodided portion on to the other. The plate was then put into the silver bath again for a few minutes, and afterwards developed.

On that portion of the plate acted upon by the iodide of potassium scarcely any traces of a picture were visible; whereas on the other portion a picture very quickly appeared, and was even partially solarised.

2. A collodioned-plate was sensitised, exposed, and washed; then iodide of potassium poured over the whole of its surface: it was then washed, and again immersed in the silver bath. Under the action of the developer there appeared immediately a strong negative picture.

From the two experiments above mentioned we learn that iodide of potassium, employed before exposure, nearly destroys all sensitiveness to light, even when the — iodide of silver produced by it has been changed into + iodide of silver by again sensitising it after exposure, but that it is not capable of destroying the latent image after having excited the + iodide of silver by light.

I made a third interesting experiment in this direction, the result of which will surprise all those who have not yet undertaken it, namely:—In order to prove that iodide of potassium not only does *not* destroy the latent image, but actually preserves it against the further influence of light, a sensitised and exposed plate, which consequently contained the latent image, after being well washed, had a solution of iodide of potassium poured over it: it was then washed again, and exposed to the full action of daylight. Having then again been placed in the nitrate bath for a few moments,

the sulphate of iron developed a not very intense, but still a very perfect, clear negative, with no signs of fogging.

I leave it to every practical photographer to draw his own conclusions from these experiments, in order to turn them to the best account. *(To be continued.)*

ON THE PRESENT STATE OF OUR KNOWLEDGE REGARDING THE PHOTOGRAPHIC IMAGE.

Report of the Committee, consisting of Messrs. Maskelyne, Hadow, Hardwich, *and* Llewelyn.

(Concluded from page 268.)

A hiatus must needs occur in this stage of our inquiry. The sensitive film is exposed in the camera, and in a few instants the invisible image is impressed. We remove it, and our task begins again at a tangible starting-point. The development of the image is the visible evidence that the light has been at work, and a close examination of the nature of this image is the only further key we possess to elucidate the character of the light's action.

By a comparison of the developed images formed on plates that have been exposed for the correct time to produce a good picture, with such as are produced by the direct action of the light, we arrive at two conclusions. First, a general similarity in the appearance of the various sorts of images by each method is observable; but, secondly, the deposit in the case of the developed image is far more abundant than that in the direct image. The comparison as regards the quantity of deposit in any two images is one far too delicate to be effected by the balance; but a method of instituting such a comparison with great accuracy is founded upon the ready conversion of any such images into sulphide of silver, a body transparent and yellow in thin layers, but passing through tones of sepia to almost a black opacity as the thickness is increased. The colour becomes thus a good means of comparing any two deposits, and the complete conversion of these into the sulphide is ensured by the use successively of chlorine water and of sulphuretted hydrogen. A similar comparative result may be obtained by substituting the chloride of mercury for the chlorine water.

Now the deposited images in the case of the processes by development present some points of great analogy to those formed in the direct processes; in others these images widely diverge from them. Thus, we seldom find in them those purple and violet tones which seem to characterise the subchloride of silver before fixing. On the other hand, we observe two classes of developed images: the one is of a dull metallic appearance, of a slaty grey character by transmitted light, and in but a feeble degree opaque; the other varies in colour, exhibiting brown or red hues, and sometimes even presenting perfect opacity to transmitted light, closely similar to the picture formed by direct processes. But, on testing these two varieties of image by the method of conversion into sulphide of silver before described, it is found that the dull translucent metallic image teems with silver, and becomes very opaque in the form of sulphide, while the more richly-coloured and dense-seeming image loses opacity under the sulphurising action, and exhibits at last a subdued tone of colour that brings it more on a par with the sulphuretted metallic image. Clearly, then, here density, and the qualities which give photographic value to an image, do not depend on the amount of metal that goes to form it, so much as on the chemical, and even perhaps mechanical state, in which that silver is present in it.

The several causes which determine the deposit of the images in these several states appear to be these:—

1. *The materials forming the sensitive film.*—Pyroxyline, in chemical purity, has little tendency to form the darker image. Albumen and the heterogeneous substances (including decomposed collodions), which we have had to yoke in the same class with it, have this tendency.

In general (speaking of the ordinary moist process) the tendency to produce the darker image is found to be in something like an inverse ratio, *cæteris paribus*, with the sensitiveness.

The use of the bromide of silver with the iodide imparts to a collodion film a tendency to deposit the grey metallic image, at the same time that a more powerful reducing agent is needed to develop it. It is a remarkable fact, bearing upon this singular property of bromide, that no compounds analogous to that formed by A. Kremer with the iodide have yet been formed with it. In the case of albumen, this influence of bromide is not felt; for with albumen bromide of silver is held to increase the opacity of the image.

2. *The nature of the developing agent.*—The substances used to develop the latent image, besides the free nitrate of silver invariably necessary, embrace also without exception one ingredient, the character and the purpose of which is to reduce the salts of silver. In some cases organic bodies are employed for this purpose, in others the reducing agent is inorganic. Now, whether the grey or metallic form of image is completely reduced silver, and the more opaque forms are an argentous compound (mixed or not with metallic silver), or whether all the forms of image are silver in different mechanical states of deposition, is a very important inquiry, and one on which the facts of the development and the nature of the developing agent may throw some light.

But no one who is intimate with the complex and perplexing details of this step in the photographic process will expect the chemist to come in and remove the difficulty by the use of a few formulæ. All we can hope to do is to point to a few sure results of experience, and indicate any explanation which may be suggested by facts from the laboratory analogous to these.

It is known, then, that to produce a "positive" picture in the camera the developing agent should be sulphate of iron, acidified in some cases even by nitric acid. The result is the crystalline white deposit of metallic silver. Protonitrate of iron is used with a similar result. So likewise in the laboratory it is known that a neutral mixture of the ferrous sulphate and nitrate of silver forms the grey deposit, but that the addition of a little acid produces the white and brilliant form of the metal.

If now we would take a result opposite to this from the experience of the photographist, we may select an ordinary collodion plate prepared by the usual negative process, and we shall find that protacetate of iron develops the image of a black colour. Now Rose, in the remarkable experiments on the production of argentous compounds with the higher oxides of iron, &c., to which we have called attention, shows that whereas the argentic salts containing strong mineral acids are precipitated as grey metal by ferrous salts containing similar acids, the deposit formed by uniting the ferrous oxide and the argentic oxide, or the compounds of these with organic weak acids, contain the suboxide of silver and are black.

When to this is added the circumstance that the white and grey photographic images are with facility amalgamated with mercury, but that the coloured and black images are not, it may be treated as a matter of high probability that the black and coloured images are formed by compounds of the suboxide of silver.

A directive energy is exercised upon the nature of the deposit by the various kinds of organic matter employed in the development. These all seem to restrict the limits of variation to the dark bluish black (given by citric acid when present) on the one hand, and various reds and browns upon the other; while, again, the presence of the albuminous and other substances, so often before referred to, is, as was above remarked, a sure means of forming these darker and coloured images. Indeed, albumen will determine such images notwithstanding that even free nitric acid be present with it. If it be a suboxide that causes the dark precipitate, that suboxide must go down in combination, and so resist the action of the fixing solvents.

But, 3. The character of the light has also a remarkable influence in inducing a grey or a dark character on the developed image.

If the picture has been produced by an intense light, as by a lens of large aperture, or as in the case of an exterior as contrasted with an interior view of a building, or as on a dull, misty day in contrast with a bright and sunny one, it will be found that, *cæteris paribus*, the tendency of the weaker action of the light is to allow the reduction of the silver in the metallic form. On the other hand, the more intense light has given to the molecules of the sensitive film a controlling energy which they exercise on the deposit, and which appears analogous to that of the light in the direct process, in its modifying the reduction and giving it the form of a production of an argentous compound; as though the iodic compound became in a certain sense phosphorescent to the chemical rays of the light, and operated on the mixed silver salt and reducing agent as they float over it in the manner that the direct light might be supposed to do.

Of course the materials must be nicely balanced, as regards their tendencies to produce the black or the grey images, for the peculiar action of an intense or a weak light to be made fully evident. Albumen or powerful organic agents will usually destroy this balance.

One fact remains to be observed. Whatever may have been the character of the first particles deposited on the plate that character will be maintained thenceforward, and fresh deposits

may be, so to say, piled upon the first by the singular agglutinative tendency of crystalline deposits, so long as the necessary conditions of fresh silver solution and of fresh stores of the reducing agent be supplied to keep up the action.

Our task has been, by an investigation of the chemistry of the image in its different varieties, to afford some data, at least, by which the further step may be hereafter taken of determining the precise character of the photo-chemical agency, to whose marvellous influences art owes so many beautiful results, and science is indebted for more than one intricate problem.

GOVERNMENT IN COMPETITION WITH PROFESSIONAL PHOTOGRAPHERS.

No. II.

On the present occasion we place before our readers the evidence given before the Select Committee on the South Kensington Museum, by Henry Cole, Esq., C.B., Superintendent of the Museum, as far as it relates to the photographic department.

350. *Chairman.*] Will you describe the collections of photography and reproductions ?—The photographic department of the South Kensington Museum has arisen from a desire expressed by the various schools of art throughout the country to obtain specimens of the highest objects of art at the cheapest possible rate. During the Paris exhibition the Emperor of the French was good enough to allow the British authorities there to have practically almost unlimited access to the collections of the Louvre, the Musée d'Artillerie, and elsewhere; and hardly any restriction whatever was placed upon the reproduction of any objects in those museums. As respects photography, I will show the Committee some examples of the uses to which it is turned *(producing some coloured photographs).* The Committee is perhaps aware that the collection at the Louvre is the richest in the world in objects of the class of enamels and crystal, and of course it may be presumed to be not at all likely that they will ever go out of Paris. By the good nature of the Emperor of the French, we were allowed to photograph and colour those objects so that we are enabled to give our people the benefit of them at a comparatively insignificant rate. That is one illustration of photography. I have here another, which is a *facsimile* of one of Raffaelle's drawings. At a recent sale at Christie's a drawing not larger than that, and not finer in quality, sold for more than £200. A *facsimile* of this drawing, by the agency of photography, and by the action of the department, any working man in the country may get for 5d. I would apologise for the department being something that looks like a trader, but I am afraid that it is Hobson's choice; either the department must be a trader, or the public cannot have the copies. I know, as a fact, that the Emperor of the French has not even allowed his own subjects to have the privilege which we are giving to our school of art; and I believe that unless the instrumentality of the Government had been exercised the thing could not have been done.

351. That is with regard to foreign Governments ?—Yes.

352. With reference to copying things at home, why cannot we leave that to private trade ?—At the British Museum the trustees could not permit the public to take out objects whenever they pleased to photograph them; it must be done by some one person in whom the trustees have confidence; accordingly they appoint a photographer, and by harmonious action between us and the British Museum the same photographer acts for both. In our own department, it must be obvious that we could not give any body the run of the collections, or allow them to have objects out when they pleased, with the risk of breakage; we have to take extreme precautions now that the objects are photographed by our own photographer; but it would be practically impossible to place the collections in the hands of the public to do the work themselves. Passing on to another case, the University of Oxford did not hesitate at all to entrust its Raffaelle drawings to the department; I doubt very much whether they would have entrusted them to any other body but a Government department to photograph them. The same thing applies to Windsor Castle; the Queen has been so gracious as to allow us to photograph anything at Windsor Castle which the schools liked to make use of, and to allow the public to purchase them. Here is a photograph of one of the Holbein drawings *(producing it)*, the original of which would sell for a good many pounds; but this, according to the tariff of the department, can be obtained for 1s. 1½d.: this is no competition with trade, because private trade cannot do it.

353. You say that private trade cannot do these things; why not ?—Because nobody would give it permission.

354. Are there any regulations in the department which restrict its operation to things which would not be open to private trade ?—We scrupulously avoid photographing anything which the public can photograph for itself. For instance, we have had occasion to take photographs of trees for the use of our schools, and we have been applied to to sell them, but we have refused to do so upon that ground.

355. Upon the ground that you would not interfere with the private trader ?—Yes; and moreover, if the public desire to produce those things for themselves, there is nothing to prevent their coming and ordering from us what is called a "negative," and then they can print from it as many copies as they please.

356. Mr. *Kinnaird.*] For trade purposes ?—Yes.

357. Mr. *Joseph Locke.*] Cannot they do that without coming to you ?—They cannot go into Windsor Castle or into the Louvre to take the negative.

358. In places to which they have access they can do it precisely as you do ?—Yes; but there we do not act at all.

359. *Chairman.*] As to the cost of that department, is it self-supporting ?—I am in hopes that when it is in full action it will be. It has only been established during the last year, and at present, as in most cases of this kind, we have to get a little experience. We had not room enough at first, and we worked a little to waste; but even now it is very nearly paying its expenses, far more than the Ordnance Survey, which is a precisely analogous case.

360. Have you anything more to add upon that subject ?—I will hand in the rules upon which the public can obtain photographs. *(The same were handed in).*

Appendix (C), No. 10.

Official Photographs.—May, 1859. No. 341.

1. To enable the public to derive the fullest advantage from the negatives which have been, or may be hereafter, made, officially, for the department, from rare and valuable objects in foreign museums, and in other collections which cannot be photographed by private agency, the following tariff of price for "positive" impressions has been sanctioned by the Committee of Council on Education:—

For Unmounted Impressions.

	s.	d.
A single impression, the dimensions of which contain less than 40 square inches, *e.g.* 5 × 7 inches, or 4 × 8 inches	0	5
40 square inches, and under 60	0	7½
60 ,, ,, ,, 80	0	10
80 ,, ,, ,, 100	1	0½

And so on, adding 2½*d.* for every 20 square inches or under, up to 500 square inches. For prices above 500 square inches, *see* detailed list.

2. The department does not charge itself with the mounting of impressions, which the public is able to do for itself, but the agent will afford every information on the subject of mounting.

Photographs of Objects in the Museum of Art.

3. Artists, manufacturers, and the public generally, who may desire to have photographs of any special objects in the museum of ornamental art, can order negatives of such objects at the rate of 3*d.* per square inch. Any size under 30 square inches will be charged as 30 square inches. One proof of the negative is included in the charge for the negative. The department does not undertake to print any further impressions, but they may be ordered from Mr. Thurston Thompson, 1, Campden Hill Terrace, Kensington.

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370. Mr. *Adderley.*] Has there been much sale for those photographs in the office ?—There would have been a very large sale if we had been able to supply them; but our means of production at present are not at all equal to the demand; the public have a most hungry appetite for them.

371. Is the demand chiefly from schools or from the public ?—Both; schools have largely demanded them, and so have the public who have come to the museum.

372. Mr. *Joseph Locke.*] Does that answer apply to all the photographs ?—Yes; there is a run sometimes upon one more than upon another.

373. Mr. *Blackburn.*] For all practical purposes those photographic copies are as useful for educational ends as the originals ?—I should say, perhaps, that is a little stronger than the fact would justify; but where you cannot get the original, this is so clearly like the original that it nearly answers the purpose. Of course the thing itself has qualities about it which no copy in the flat can ever realise; you cannot get the translucency of the original, for instance.

374. For educational purposes, is not the copy as available as the original ?—A person who understands these matters will not be content with a photograph of the object if he can get the original; he would have a photograph rather than nothing.

375. Mr. *John Locke.*] You were speaking of the photographs that have been taken of works of art at Windsor Castle and at Oxford. By whom were those photographs of the Cartoons at Hampton Court taken ?—By the same photographer.

376. Were those taken for the South Kensington Museum ?—Yes.

377. Those are for sale at Colnaghis', are they not ?—We allowed Colnaghis to have the facilities of the apparatus and stages that we put up; we applied to the Office of Works for permission to photograph the Cartoons, and we gave an assurance that they should be watched during the process, and the sappers were responsible for lifting them up and down. We went to some expense for apparatus, and we did the whole business most carefully. We were asked if we had any objection to Colnaghis on their own responsibility doing the same, and we had none at all.

378. In fact, Colnaghis made those photographs upon their own account ?—Yes; if they could do it better than we, so much the better for the public; at all events we were willing that they should try.

379. Was there any offer made by any persons with respect to photographing the works of art at Oxford or Windsor ?—No; only with respect to the Cartoons.

380. Mr. *Stirling.*] With reference to these photographs which you have produced, are coloured photographs of this description sold at the establishment as well as plain photographs ?—They could be obtained, I think; there has been little demand for them. The coloured copies have been usually for the use of schools, and necessarily they cannot be made very cheap; a coloured copy like those which I have produced, and which I should say is the work of the students in the schools, would probably cost two guineas.

NOTES FROM THE NORTH.

By an Edinburgh Correspondent.

No. I.

Here, as elsewhere, clouds, rain, and wind form the staple of our weather, and, I fear, will tell upon our ensuing Photographic Exhibition. Let us hope for a change.

The various photographic clubs in this City are resuming their meetings, but it will be next month before the Photographic Society of Scotland again takes to business. There are rumours that a new Photographic Society is about to be organised in Edinburgh. Should this be the case I have no doubt that, if energetically conducted, it will prove a great success; for, from whatever cause it may arise, the above-named society is not so popular here as could be desired, especially among professional photographers. Indeed, considering the numerical strength of the profession in Edinburgh, it is perfectly marvellous that the only professed society here should contain so few of them. A large exodus, embracing the highest talent and skill, took place a few years ago; and the misunderstanding, if such it were, seems never to have been again adjusted: hence, if a new society be formed, the practical and professional element will doubtless be largely represented.

On the supposition that a new society is about to be formed, it may not be amiss to mention here an important addition, and one which would conduce exceedingly to its popularity, especially among amateurs. It is the addition of an operating-room, fitted up, not only with glass for *day* work, but with the most improved mode of artificial lighting for working after dark, when the ordinary avocations will have drawn to a close for the day. This naturally leads to a consideration of the various modes of producing artificial light of such actinic power as to enable a photograph to be taken from the living subject; for, with an ordinary gaslight, and the exposure of a minute or two, it is possible to reproduce an engraving or lithograph in the camera, but for a portrait from life something vastly superior is required. Among artificial lights, I take it the

"electric" ranks foremost. Rich in actinism, of great intensity, and capable of being increased *ad libitum*, this beautiful illuminating source stands, in my opinion, unrivalled. Compared with common carburetted hydrogen gas, the blue ray predominates to an extent that could scarcely be believed, unless by actual comparison. This looks pale and sickly, that glows like a miniature sun. Contrast can alone show the pure quality of the one over the other. It is a matter of dispute as to which battery produces this light most economically and simply. Could Smee's in moderate quantity do this it would, from its simplicity, be undoubtedly superior to any of the others; but, so far as I am aware, Grove's and its modifications are usually employed. My own experience has only been with Bunsen's, in which the platina of Grove's is economically substituted by carbon. Forty average-sized elements of this produces a very excellent light; and I have it on the authority of Mr. Hart of this place — who, perhaps, more than any one in Scotland, has had great experience in the construction and working of electric lights—that, with a proper "burner," twenty good elements of Bunsen's will produce a light equal to a moderate oxyhydrogen light.

The bother attendant on a battery of forty or fifty elements is such, that this source of illumination will, for the practice of photography, especially among amateurs, remain in abeyance for a considerable while longer — at least I rather suppose so. In every way more readily under management, and much more convenient in working, next comes the lime—magnesium or oxyhydrogen—light. By the way, I may state that I have never tried or seen magnesium substituted for lime, hence cannot say, from experience, what improvement is caused by the substitution. It is, however, said to be an improvement. Common gas, or carburetted hydrogen, seems to be a very excellent substitute for pure hydrogen in this light. The cheapness and universality of common gas seems to go a great way to recommend it. In any experiments which I have seen, the quality of the light did not seem much varied, whether the hydrogen were pure or carburetted.

There seems to be a certain amount of fear about using this light, which I cannot but consider as ill-grounded. All explosion may be avoided by a simple mechanical contrivance, viz., causing the gas to pass through either a tube stuffed with wires or a few layers of fine wire gauze. There is no doubt that oxygen does require care; for, when contaminated with a very small amount of hydrogen or olifiant gas, it is very explosive. At a late meeting of the Society of Arts in this place, Mr. Alexander Bryson accounted for an explosion of some severity which had taken place, by the fact of the hole in the retort by which the gas tube is screwed in having been that day re-screwed by a blacksmith, and the minute traces of the oil used to facilitate the screwing generating sufficient olifiant gas to cause an explosion of a somewhat violent character. This, I believe, is the only objection which can be urged against this light, which otherwise is very excellent, yielding a good light, easily increased by an addition to the number of jets, ready for use at all times, and which may be turned off when done with. The cost of this light is very moderate.

Next in the category comes Moule's patent photogen. With the exact constituents of this light I am not acquainted; but a very excellent compound for producing a most brilliant light is—

Nitre	6 parts.
Sulphur	2 "
Sulphuret of antimony	1 "

This, when intimately mixed and fired in a small vessel, such as a pill-box, gives a light by which the "human face divine" may be reproduced in twelve or thirteen seconds. The only objection to this (and one which can easily be got rid of) is the fumes which arise. Here, then, are three modes of illumination, any of which may answer for an operating-room of a photographic society.

Were it not that these notes are already too long, I would enter briefly on the subject of the curvature produced by compound lenses, with reference to some remarks by Mr. Dallmeyer, at the meeting of the London Society. This, however, in my next.

LUMEN.

Letters to a Photographic Friend.

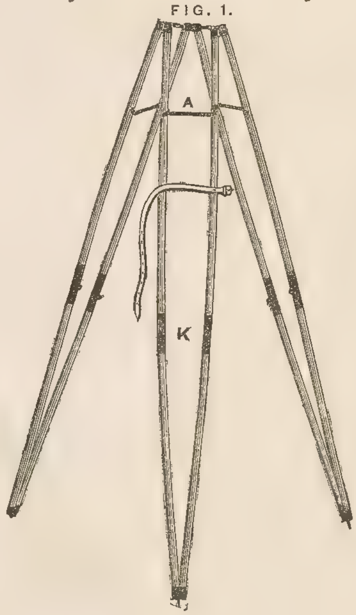
No. VII.

Dear Frank,

On returning to the attack at Messrs. Horne and Thornthwaite's, in Newgate Street, I found that they also had been giving their attention to the perfection of the bellows form of camera. Their arrangement consisted of a central frame permanently fixed to a portion of the base-board, to which the front part of the bellows body was attached, and into which it packed. The back frame that carried the focussing glass and plate-holder shut up close upon this central frame, and then the back and front portions of the base-board, being hinged, shut up on each side, just in the same way that the cover boards of a book close upon the letterpress portion. When packed in this the camera was between five and six inches in thickness. To bring it into action, the central portion is clamped on to the tripod stand, the front and back parts of the base board lowered, which are then made perfectly rigid by inserting two steel bars into deep grooves cut into each side edge, so that the three portions are clamped, as it were, into one rigid piece. The back frame with the bellows body is then drawn back and clamped to the hind portion of the base-board. A conical front, made of black cloth, is then drawn forth from the front of the central frame, attached to a piece of wood that carries the flange plate of the lens, and the latter is then secured to the front portion of the base-board by means that secure rigidity. Thus a camera intended for large plates packs into a small compass, and yet places a long range of focus at the disposal of the operator.

I have now to draw your attention to one of the most ingenious, and at the same time one of the most rigid tripod stands I have hitherto seen; but to render its construction clear I must call in the aid of my pencil. *Fig.* 1 shows the stand set up for use, and you

FIG. 1.



will see that the two limbs of each leg are kept *taut* by a forked hinged bar A. Now, the peculiarity of this stand is, that the legs are not separated from the tripod head when done with, but the whole stand is kept together; and yet, by the way in which it is made to fold up, it occupies no more space, if so much, as an ordinary set of legs, and is in every way more convenient. *Fig.* 2

FIG. 2.

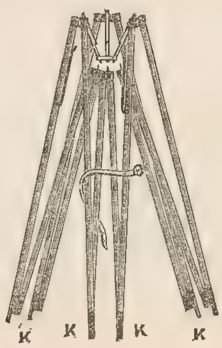
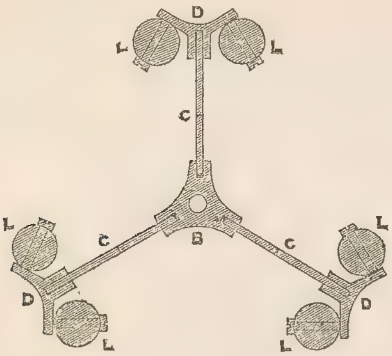


FIG. 3.

will give you an idea how this stand folds together, which you will better understand by consulting *fig.* 4, which shows how the

FIG. 4.



tripod head is made up of a central portion, B, to which three bars, C, are hinged, and to the other extremity of these other fittings, D, are hinged, to which the upper limbs of the legs, L, are attached by pivots. *Fig.* 5 will at once show you how the tripod head shuts up, in fact somewhat after the manner of the ribs of an umbrella, the reference letters corresponding with the parts in the preceding figure. The next point to make clear is the construction of the knee-joint, K, shown in *fig.* 6. L is the upper limb, and *l* the lower limb of one of the legs; the lower end of L is shod with a piece of tube, cut so that a portion is bent out to form part of a hinge, whilst half of the tube beneath it, M, is cut entirely away. The upper end of *l* is also capped with a piece of tube, likewise having a portion split and turned outwards, so as to form a hinge when connected with the other piece by a wire passing through from one side to the other. The sides of the tube at M are slightly bent inwards, so that when the limb *l* is brought into a straight line with L, it acts as a spring on the upper part of *l*, and keeps it rigid. If the two surfaces of the mahogany limbs were allowed to come in contact, a tremulous motion would at times be imparted, so the limb L is only allowed to pass into its tube as far as N. *Fig.* 3 shows the stand packed—and it certainly is the most compact, light, and efficient set of legs I know of. As the newspaper reporters say, in speaking of some benevolent person or "jolly good fellow," it "has only to be known to be esteemed." Without doubt it is a capital dodge. When set up, as in fig. 1, the little pieces that you see projecting from the ends of the bars C C in *fig.* 5, act as stops or bearings when the camera is screwed on to the tripod head, and rigidity of course is not secured till the camera is screwed in position.

FIG. 5.

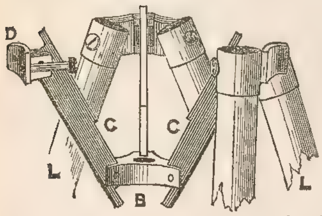
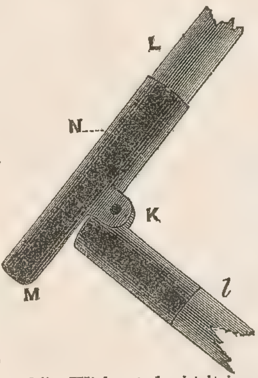


FIG. 6.



I next made my way to the London Stereoscopic Company, in Cheapside, and examined an extensive series of photographs of American scenery lately introduced into this country. These comprise not merely stereoscopic subjects, but large views of the most interesting spots in Canada and the United States. Of course Niagara figures largely in the series; and one is easily able to form a very good idea of the grandeur of those mighty Falls by examining such stereographs as *The Rapids*, No. 115; *The General View of the Falls from Prospect Point*, No. 140; *The Horse-Shoe Fall and the Terrapin Tower* (instantaneous) No. 153; and the *Table Rock*, from the base of the Horse-shoe Fall. Among the large photographs there is a capital panoramic view of the entire scene. Most persons in England have been in doubt as to whether Blondin was not an apocryphal personage, but a stereograph in this series depicts a gentleman in the usual "India-rubber—incredible-brother" costume, poised on a rope over the rushing waters of Niagara. This is something like an authentic proof that Blondin had an existence otherwise than in the fertile brains of a Yankee editors or in the veracious and voracious columns of American newspapers. Slide 136 gives an exquisite rendering of the stalactite-like icicles in one of the ice caverns of the White Mountains, New Hampshire; *The Chaudier Falls*, No. 113; *The Cataracts on the Genesee, near Portage*, No. 125; whilst many other of these stereographs present objects of great interest. Moreover they are as well executed as the points of view are well selected.

From "Under Bow Bells" I went away to Mr. Squire's, of King William Street, to inspect Leake's Dark Tent. This, for stereoscopic work, consists of a tray 22 inches by 12, and 2 inches deep; into this packs a kind of black bag, made impervious to light, the lower margin of which is tacked to the inside of the tray, and the upper margin to a piece of wood that forms a lid to the tray; after the tray is attached to its tripod stand, the bag or tent is pulled upwards, and then kept perfectly rigid by means of two stout brass rods (one on each side) being forced into indentations made in the tray and lid to receive the ends. The dark chamber is then about 22 inches high, with a yellow window in front, and an aperture behind to receive the upper part of the body, light being excluded by a curtain falling over the back of the operator. This tent is very rapidly put up or struck, is exceedingly portable when shut up, and is the lightest I have yet seen.

Having got to the photographic end of the City, I have got to the end of this letter. In my next I purpose recording the results of my wanderings in many an unknown nook of London. But if you should not hear from me again, apply to the Dead-Letter Office or the Found Dead Department of Bow Street; for I have a vague idea that I am going to spots where rampant cattle do congregate and pitfalls abound, through the projectors of new streets keeping open house—as far as their cellars are concerned.

So believe me,

Yours, bound for the back settlements,

SIMEON HEADSMAN.

STEREOGRAPHS.

Instantaneous Marine and Street Views, by GEORGE WILSON, *Aberdeen.*

PERHAPS one of the most striking and really valuable steps in advance that have been made during the past twelve months in the practice of photography is that of the excellence to which the production of "instantaneous" photographs has been brought in the hands of some of our more highly-skilled operators. One of the first of this class of subjects, which took the fancy of the photographic world by storm, was the well-known *Brig*, by Le Gray; but this, beautiful and artistic as it undoubtedly was, possessed those merits in spite of its defects. The reality was a glorious blaze of sunshine flashing from out the rolling masses of clouds, and flooding the rippling waters of the ocean, which even in their quietude may be with truth described as ever restless: the semblance was of that same ocean partly veiled by night's soft mantle, and which the tender moonbeams touched with liquid silver. It was not exactly the truth, though perhaps as beautiful as if it had been.

In stereography we have, upon several occasions, had to draw attention to some well-designed attempts "to fix the fleeting shadows as they passed," and these have generally been nearer to the truth, though perhaps not more artistic than Le Gray's *Brig*. If the whole truth must be told, also, we have still more frequently had to be silent and make no sign when specimens of "instantaneous" views have been received for criticism, for there is no need to tell the world when such an one has failed in a well-meant aim; and we only allude to the subject at present in order to point out the fact that now many of the earlier difficulties have been overcome. We no longer get mere black and white in these productions, but a considerable share of half-tone. Moreover, we now have not only marine subjects, but busy street scenes, with all the active bustle of daily life portrayed therein. It might be thought by the novice that if it be possible to catch the form of the breaking wave, it is no great feat to obtain also the view of the crowded thoroughfare; but this is quite a mistake. There is something in the atmosphere at the seaside which gives the operator in that kind of

locality a decided advantage over his more inland situated brethren, especially in the point of time of exposure. In the slides by Mr. Wilson, now before us, however, we have to deal with both the kinds of localities mentioned.—And first we have three of

PRINCES STREET, EDINBURGH, *looking towards the* CALTON HILL.—These are all excellent as photographs, being quite free from anything approaching to under-exposure, and are full of half-tone. Numerous vehicles and pedestrians are to be seen, some in rapid motion. Though all three slides are good, No. 190 is, in our opinion, decidedly the best. It not only contains the greatest number of figures, but they are also well-defined and sharp, even those nearest to the camera. This slide, as regards manipulation, is decidedly superior to the views in Broadway, New York, that we noticed some short time back. The very gait and aspect of the passers-by would, of necessity, be recognised by their acquaintances.—As companions to the preceding, we have two of

THE QUADRANT, and one of the upper part of REGENT STREET, LONDON.—In No. 206 there are several Hansom cabs advancing at a rapid pace towards the spectators that are exceedingly characteristic of the style of progress peculiar to that kind of vehicle, and which are capitally defined; but, strange to say, a foot passenger running after an omnibus, whose figure occupies one corner of the picture, is sufficiently blurred to show that, quick as the exposure must have been, yet still it occupied an appreciable space of time. It also demonstrates the optical difficulty in correcting the oblique pencil of rays.—No. 205, representing the upper part of the street, with a goodly array of pedestrians on *the fashionable side*, albeit not at the fashionable hour, is a very attractive subject, and will no doubt be in great demand.

We now turn to the marine subjects. And here we would remark that, with one or two exceptions out of about twenty before us, there is nothing of the *moonlight* effect to which we referred in connexion with Le Gray's picture; but neither is there in most of them sunshine displayed—most probably for the reason that, when the negatives were taken, no sunshine was visible

"O'er the glad waters of the dark blue sea."

There are some half dozen views taken FROM RYDE PIER, ISLE OF WIGHT, in which various pleasure yachts may be seen, bending to the breeze. As Byron says,

"How gloriously her gallant course she goes!
Her white wings flying—never from her foes;
She walks the waters like a thing of life,
And seems to dare the elements to strife."

These slides are admirable, portraying all the varied beauties of clouds and waves, and are to the marine artist invaluable.—Nos. 243 and 244 are particularly pleasing: in the latter the cloud of steam issuing from the funnel of a steam-packet in the distance is very effective.

THE STRANDED COLLIER (No. 238) is a perfect marine picture—stranded on the soft wet sand, and heeled over a little on the larboard side, with sails all furled and trim. Two carts are alongside, to ease her of a portion of her burden of black diamonds. One of the carts is "backed" close to the vessel's gangway, and is in the act of receiving a load—the horse in the attitude that reminds one so strongly of the soldier at the word "attention!" Some of the crew are visible on the deck; and the broken reflection of the whole is seen in the sloppy sand of the foreground, while a low sandbank is seen behind, and beyond that a brigantine at anchor. This slide will certainly be highly popular.—There are half-a-dozen slides of

THE GREAT EASTERN IN THE SOUTHAMPTON WATER, which, irrespective of the interest attached to the vessel itself, are beautiful as studies of clouds and waves. Where all are so good it is difficult to make a selection; but we cannot forbear particularising Nos. 219 and 220, in which the breaking wave on the shore is rendered with peculiarly happy effect.—No. 223 is one that presents a little of the moonlight effect, but is especially beautiful from the fleecy clouds that are portrayed. The waves are here much smaller than in the other pictures, and that on the sand displays the white foam to advantage.

With some seven or eight illustrations of the FRITH OF FORTH we shall close the present notice. There are two of the CHANNEL FLEET, in which the frigates are to be seen decked in gala attire of countless flags; while steamers and sailing vessels are scudding about in various directions, like dogs gambolling about the footsteps of their masters.—The remainder are representations of

H.M. SHIP "EDGAR" and H.M. SHIP "ROYAL ALBERT," under various aspects. These are at anchor, and the numerous portholes for their many tiers of guns can be counted with precision.—

"Far on the horizon's verge appears a speck,
A spot!—a mast!—a sail!—an armed deck!"

Nos. 224A and 224B are truly exquisite productions. In the former numerous yachts, with their snow-white sails, are coursing around the vessel of war like lambs round a fortress. In the latter a steamer, towing a line of sailing barges or some such craft, deeply laden, is crossing in front of the frigate, and the long trail of white steam testifies to the speed of her progress.—No. 225 is also an admirable study of shipping.

We cannot conclude without congratulating the art-loving portion of our readers on the rich treat in store for them in studying these admirable productions.

Bath and its Environs, by H. N. KING.

THE ancient city of Bath, the existence of which dates back as far as the time of the Roman occupation of this island, and is celebrated for its natural hot springs, has found an able illustrator, photographically, in Mr. King, a resident in that attractive spot. Who has not heard of its once famous Assembly-rooms—immortalised also in "Pickwick?" Who has ever passed it when progressing along the Great Western Railway without feeling a desire to stay there, if only for a day or two? And if such desire be the effect of a passing glimpse of that renowned city, an inspection of the stereographs now before us is not at all likely to lessen it. We have neither time or space to notice the whole of them, but must devote a few lines to some that strike us more prominently than the remainder. And, firstly, we must call attention to WIDCOMBE OLD CHURCH AND MANOR HOUSE, No. 2, both being quaint and ancient structures, picturesquely situated—the former having a square tower literally enveloped in ivy, and pierced by several gothic windows. On one of the pinnacles is seen the symbol of the "cock," the emblem of St. Peter's weakness, and the origin of the "weather-cock," now but rarely seen in the form which makes the appellation an appropriate one. This is an exceedingly pleasing slide, as is also another which gives a different view of the church, disclosing somewhat more of the basement portion.

THE MANSION IN PRIOR PARK, No. 20, is an excellent specimen of the architectural series, and gives a good idea of the edifice which it is intended to illustrate.

PRIOR BIRD'S PRIORY, No. 17, is one of those quaint, snug, old-fashioned domiciles with red-tiled roof and pointed windows in which some of the church dignitaries of old made themselves very comfortable. It makes a capital picture, with its broken outline and numerous creepers lovingly entwined about the various casements; while, as a background, a group of trees, in which the elm, fir, and yew are readily recognisable, acts as a foil to throw up the building prominently; and the thin wreath of smoke from one of the chimneys gives evidence of human habitation. The garden is on a slope; and in the centre of a lawn in the immediate foreground is an extensive circular pond, with a fountain in full play, which only ripples the water sufficiently to veil the sharpness of outline of the soft, reflected image of the house. This will certainly be a favourite with purchasers.

THE PALLADIAN BRIDGE, PRIOR PARK, No. 29.—Of this subject there are two illustrations from different points of view; but that numbered as above indicated is far the best, and is in every way an excellent photograph.

VIEW AT THE PARK POND, VICTORIA PARK, BATH, is a good illustration of variety of foliage, and the aspect presented by different kinds of trees picturesquely grouped.

The difficulty of properly rendering foliage together with other objects, each with its due amount of relative light and shade, is acknowledged by every practised photographer, and it is a problem the solution of which deserves the best energies of all scientific operators. The details of Mr. Heisch's labours towards this end should be carefully examined by all who work in this direction.

BATH, FROM BEECHEN CLIFF.—Under this title there are four different views, comprising an extensive range of the chief parts of the city: these must be regarded as fairly successful, for we are informed that it is but rarely that a *clear* view of Bath can be obtained from the spot, which is between two and three miles distant, but when clear the view is a particularly pleasing one.

We are informed by Mr. King that he develops solely with iron, using no after intensifying process, and simply washes off the developer without fixing the negative until he reaches home, when he can fix properly, and afford the requisite amount of washing without stint of water.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The Annual Meeting of this Society was held on Wednesday, the 3rd instant, at the Rooms of the Literary and Philosophical Society, George Street, Manchester,—Joseph Sidebotham, Esq., one of the Vice-Presidents, being in the chair.

Seven new members were elected.

The President said he was sorry to have to name that Mr. Edward Mann, the Honorary Secretary, had stated that he was unable, from his various other engagements, to continue the duties of Secretary. He (the Chairman) had once been the Secretary, and he knew that there was more work to be done than perhaps many were aware of. Mr. Mann had ably fulfilled the office for upwards of two years, and had at all times given the greatest attention to the interests of the Society. He (the Chairman) should be sorry to lose Mr. Mann as Secretary, and no doubt the whole of the members would join him in his regrets. However, there was another gentleman who was, he believed, willing to accept the office of Secretary, and who was well known to every member as having the interests of the Society at heart. He thought he need only name Mr. W. T. Mabley, as the gentleman to whom he referred, to ensure his unanimous election.

A vote of thanks was passed by acclamation to Mr. Mann for his past services as Secretary.

Mr. W. T. Mabley was then elected Honorary Secretary, and Mr. Edwin Offer, Treasurer.

The following gentlemen were elected on the Council for the present year:—

President.
The Lord Bishop of Manchester.

Vice-Presidents.
J. B. Dancer, Esq., F.R.A.S.
J. P. Joule, Esq., LL.D., F.R.S.
Arthur Neild, Esq.
H. E. Roscoe, Esq., B.A.
Joseph Sidebotham, Esq.
W. C. Williamson, Esq., F.R.S.

Council.
The President.
The Vice-Presidents.

Mr. A. Brothers,	Mr. James Mudd,
,, J. Compton,	,, H. Petschler,
,, Samuel Cottam,	,, A. Patterson,
,, J. Dorrington,	,, John Parry,
,, John H. Gilbert,	,, J. J. Pyne,
,, George Higgins,	,, F. Töbler,
,, William Hooper,	,, H. Young,
,, Edward Mann,	,, G. Wardley.

Honorary Secretary.
Mr. W. T. Mabley.

Treasurer.
Mr. Edwin Offer.

After the election of the Council as above, Mr. Mann, the Honorary Secretary, read the following report of the Council for the past year:—

ANNUAL REPORT.

The Council of the Manchester Photographic Society, in presenting their Annual Report for the past year, have great pleasure in congratulating the members upon the very flourishing state of the Society.

The Treasurer's account shows a balance in hand of £50 17s. 3d.

There has been a considerable accession of members during the session, and the subscription having been now reduced (in consequence of the decrease in the expenditure) to 10s. 6d., with fee of 10s. 6d. for entrance, it is anticipated there will be a much larger increase during the next year.

The meetings have been generally well attended, and the experiment which has been tried of continuing the meetings throughout the year, instead of having a vacation as before, has been attended with complete success, and many very interesting meetings during the summer have been the result. Notwithstanding the extremely unfavourable photographic season, most of the members of the Society have made considerable and valuable additions to their stocks of negatives, and numerous excellent specimens have been presented by them to the Society's portfolio, which has now become a very bulky and interesting record of the progress of the art.

The Photographic Exchange Club has, so far, progressed very favourably; and it is anticipated that the contributions will be ready for distribution among the members on or soon after this evening.

The following papers and subjects, among many others, have been read and brought before the meetings during the year:—

Mr. W. T. Mabley read a paper, written by George Shadbolt, Esq., expressly for this Society, *On the Focus of Lenses.*

Mr. Dancer contributed an Oxyhydrogen Lantern, with the requisite apparatus, and exhibited numerous very beautiful transparencies upon the screen, they being entirely the productions of the members of this Society.

Mr. W. T. Mabley read a very interesting paper on the subject of *Photographic Printing on Paper*, which was illustrated by numerous specimens.

Dr. H. E. Roscoe read a paper, entitled, *Some Points concerning the Measurement of the Chemical Action of Light*, and which he illustrated by various diagrams and interesting experiments.

Mr. Mann, the Honorary Secretary of the Society, read a paper on some experiments made by Mr. H. Petschler and himself, communicating some new and important chemical facts with respect to the iodide and chloride of silver, and upon which Mr. H. Petschler had founded a very valuable modification of the collodio-albumen process. This discovery has attracted a good deal of notice, and is perhaps one of the most important matters brought before the Society during the session. As some misapprehension has arisen in reference to the originality of this process, it has been thought desirable to explain, in this report, that which constitutes Mr. H. Petschler's discovery. It had been previously discovered that the *application* of a chloride to an excited plate did not destroy its sensitiveness, and in all cases the chloride was removed by washing; but this operation was not adopted for the purpose of restoring a dormant sensitiveness to the action of light, but simply to prevent a crystallisation upon the surface. It was not known, so far as published accounts show, that the plate was rendered sensitive by the washing. The discovery, therefore, is, that a film of iodide of silver is insensitive when in presence of a certain amount of an alkaline chloride, or iodide, but after a dormant manner only, and that it may be excited simply by washing. Since the last report many members have experimented largely in several of the dry processes, but the opinion is general that there is not one which can surpass or successfully compete with the Taupenot. The process (above alluded to) of Messrs. Petschler and Mann affords much promise, but it is thought desirable that more experience should be gained of its capabilities before an opinion of its practical value is given. The subject of the dry processes, however, cannot be dismissed without mention of Dr. Hill Norris's latest improvement. Negatives have been shown in this room which were taken by an exposure fully as short as that required for wet collodion; and, although the results, so far as they have been made known to us, are wanting in tone and vigour, the step is so important and so suggestive of that which is most wanted, that it may be considered as the greatest event of the season.

Though the Society had very short notice of the kind offer made by the committee of the Salford Royal Museum and Library, to set apart a room expressly for the purpose of a Photographic Exhibition, a special committee was at once appointed, and a very excellent exhibition of the works of local photographers (with very few exceptions members of this Society) has been the result.

At the last meeting Mr. J. Parry read a paper on some very interesting and valuable experiments which he had made respecting the aceto-nitrate bath, as used for the collodio-albumen process.

The alkaline gold toning process has now come into universal favour, and it is a matter for great congratulation to notice the very superior and beautiful results produced by this the more correct method than the old ones, and which has the probabilities of permanency as well as superior whiteness and beauty of tone to recommend it.

The Council have great pleasure in calling the attention of the members to the fact that the British Association for the Advancement of Science have arranged to hold their meeting in Manchester during the next year, when it is hoped that some effort will be made by this Society to worthily represent the photographic art on that occasion.

In concluding this Report the Council have great pleasure in tendering their best thanks, on behalf of the Society, to George Shadbolt, Esq., the editor of The British Journal of Photography, the special organ of the Society, for the valuable assistance he has at all times rendered, and for the constant attention which he has always given to the general interests of the Society.

The Secretary then read the Treasurer's accounts, when they and the report were unanimously approved of and adopted by the meeting.

Mr. Wardley presented a series of photographic pictures, taken by the collodio-albumen process, of views in the Lake district, to the portfolio of the Society. These pictures were very much admired for their artistic effect.

The President called upon Mr. Parry, who had a communication to make to the meeting.

Mr. J. Parry then read a paper *On a Modification of the Collodio-Albumen Process.* [See page 298.]

A very animated general discussion took place on the subject of Mr. Parry's communication, particularly as to the extent to which the albumen would be coagulated by the hot water.

Mr. Dorrington said he had tried the method adopted by Mr. Parry, and had succeeded excellently with it, and he considered it a very valuable modification of the dry processes.

A vote of thanks was unanimously passed to Mr. J. Parry for his paper; and after a very interesting and numerously attended meeting, the proceedings closed with a vote of thanks to the President for his services in the chair.

On the table were a number of beautifully-executed photographs by the members of the Society.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The first ordinary monthly meeting, for the season, of this Society was held in the Religious Institution Rooms, on Thursday evening, the 4th inst.,—J. Kibble, Esq., the President of the Society, in the chair.

A paper *On Printing and Toning on Albumenised Paper* was read by Mr. J. Stuart.

A lively and interesting conversational discussion followed the reading of the paper, in which the Chairman, Messrs. James Cramb, Hugh M'Farlane, J. Ewing, A. M'Tear, D. Brown, and John Cramb, took part.

The same subject was continued for next meeting, members being expected to come prepared with the results of their experience, whether successes or failures, in printing.

It was suggested that those who make albumenised paper for sale should tell the amount of salt employed by them.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Continued.)*

SCUMBLING.

This is a process of glazing with thin opaque colour, and is very useful indeed to modify, subdue, soften, or alter the tone, texture, or crudeness of your painting. It is generally made use of in the second, as glazings are in the third, on finishing painting. In your background scumbling will aid you in securing the effect of atmosphere, and in all parts of the painting you will soon learn its value.

In adopting it, use the colour with a full brush, and without too much vehicle. Hard outlines may be got rid of by its use, and it serves more effectually than glazings do to destroy that painty appearance which I have before advised you to avoid. Scumbling may be adopted to alter the ground, when necessary, for the reception of fresh glazes; in which case the opaqueness is increased by the addition of white. Crude, raw colours may also be subdued by this process. Upon glazing and scumbling nearly all the richness, brilliancy, and transparency will be found dependent. Scumbling should be avoided, if possible, in the shadows. In dark photographs, however, it is necessary, although great care is requisite when using it in such parts.

IMPASTING.

Impasting, in the hands of the inexperienced photographic artist, requires such extreme care, and is so likely to destroy the likeness, if he has not that knowledge of drawing which would enable him to preserve it, that, by such, it should be but partially adopted; and then its effect should be obtained by continual applications, with intervals for drying after each, rather than by laying the colours on thickly at once (see maxims 40 and 53). Impasting is too valuable to be altogether dispensed with: by its aid we get more freshness, clearness, and brilliancy; and, moreover, solid colour is essential for preserving the beauty of the original painting, and aids also, by contrast, the effect of our transparent colours in the shadows — its use being chiefly confined to the lights. So effectual in securing brilliant high lights has this method proved, that many are tempted to carry it beyond reasonable limits, and lay the colour on so thickly as to produce an actual protuberance, which, casting its own shadow, produces a false effect, and conveys a more prominent idea of a lump of paint than of anything else (see maxims 7 and 39). In large heads impasting is as frequently done with the palette knife as the brush—the blade being of assistance in securing a flat surface to the pigment.

HANDLING.

To a certain extent handling may be regarded as a mechanical quality; but its power of securing texture gives it also a much higher attribute, every variety of surface having its expression secured by certain peculiar and characteristic methods of touch. A good style of handling cannot be obtained from any source but that of experience and practice; it may, therefore, be enough to advise that in the first colouring a bold, dexterous way of laying on the tints, clean and distinct, and placing each in its position with as little labour as possible,* can be used; that a more careful and laborious style of pencilling should follow; and that a small pencil, with thorough attention, patience, and thoughtfulness, be adopted for the finishing.†

You have to be cautious that your mode of handling does not degenerate into the mannerism of being the same for all surfaces, giving but one texture for the ruggedness of granite and the polish of marble, as is lamentably common with the vulgar "tea-boardy" productions exhibited at some of our "finish" (?) loving photographers' establishments (see maxim 6). Hatching and stippling are useful in the last painting; but these terms I have fully explained in the chapters devoted to water colours.

BLOOMING.

A technical term to describe the effect produced by applying a soft varnish when the surface of the picture is not thoroughly dry; or the operation is performed in cold damp air. It is sometimes called chilling, which is the more expressive word perhaps. To remedy such a defect, rub it off as soon as it appears with a piece of old silk and a little poppy oil.

OILING OUT.

As there is very great danger in varnishing a picture too early, a little drying oil is sometimes used, instead of varnish, to bring out the colours. This practice is known under the above term.

VEHICLE.

It may be as well to say that this term simply implies that which is used to make the colours flow from the brush, namely, oils, magilps, varnishes, &c.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

MISS D. (Kingsland).—Your progress flatters me vastly. The various theories of symbolic colours are so purely speculative as to be almost unintelligible. In early art some such systems may have been pretty generally recognised; but we moderns have not much sympathy with those who attempt their revival. It is really little better than laborious idleness to enter upon the study, although there are many who, like yourself, feel deeply interested in it. I cannot just now recal the names of any writers who have devoted their labour to this subject; but there are many. It seems to me that colours derive their symbolic value from the mere association of ideas, which are themselves of a most chamelion-like character. Chevreul will give you something tangible and understandable—something practically useful. The quotation is from a work by Moses Harris, called "The Natural System of Colours." The other work you name was translated from the German of Libertat Hundertpfund — am sorry to trouble you to pronounce his name—and was published by Bogue, of Fleet Street. I am glad you are so earnest in your studies; but think symbolic colours might be safely let alone for more profitable labour.

ANNIE.—The outlines are too hard, the flesh-colours a little too raw, and the greys not clean enough: stop at the tinting till you have mastered it, then try to finish highly. The glass picture is all that could be desired.

JAMES.—A private reply was sent to the address given.

A SCHOOL OF DESIGN STUDENT.—Yes. Too late for the last number.

Foreign Correspondence.

Paris, October 10, 1860.

YESTERDAY I received a visit from an amateur whose conversation greatly interested me. My visitor was Dr. Sabatier, one of those modest *savants* who withdraw from men and from mundane noise to give themselves up to untiring work. He lives in a little village in the environs of Paris, where, amidst the calm of country life, he pursues his favourite investigations in entomology. It was his desire for completing the notes and descriptions resulting from his studies that led him to recognise the necessity of employing photography, and so he became an operator. Though the means at his command were deficient, and his instruction in the art elementary, he has yet succeeded, not only in acquiring a most curious collection in a scientific point of view, but also in elaborating a special process based upon a new principle, which may perhaps be a point of departure towards unlooked-for improvements in photography. I will communicate to you the description which Dr. Sabatier gave me of his method.

This process has for basis a capital fact which has hitherto remained unnoticed, namely, that certain substances, when poured in solution upon a negative *cliché which is in formation*, exerts thereon, whatever may be the developing agent made use of, such a *disturbing* and *substitutive* action that the development of the negative is arrested at the very instant of contact, and the chemical combination which follows the contact gives birth to a positive.

The substances possessing this disturbing and substitutive power are probably numerous. They include perhaps many of the neutral salts and all the alkalies; but from the necessity of limiting his investigations, Dr. Sabatier confined himself to nitrate of silver, ammonia, and lime-water, which all three possess the power in the highest degree.

To prove the reality of a fact of so great importance, and to put it beyond doubt, the following is his mode of proceeding:—

Upon a square piece of white paper he draws ink lines — broad and very black — and focuses so as to take a print of the paper on a glass collodionised, iodised, and sensitised as usual. After exposing the plate in the camera, he pours over it a solution of acidulated pyrogallic acid; then, when the whites of the paper begin to appear, and long before the action of the developing agent is exhausted, he washes the glass with distilled water, and covers it with a weak solution of nitrate of silver.

One or two minutes after this last operation, the whites do not appear to have changed, but the intensity of the blacks is inversely proportional to the length of time the pyrogallic acid has remained on the glass. The same result is arrived at if, instead of nitrate of silver, we pour over the glass a sheet of ammonia or of very weak lime water.

This experiment succeeds regularly and infallibly, provided the sensitising bath and the feeble solution of nitrate be perfectly neutral. It succeeds also if we take as developing agent gallic acid or protosulphate of iron that does not contain any sulphuric acid in a liberated state. This places beyond a doubt the disturbing and substitutive influence of the three substances experimented on, whatever may be the developing agent employed.

Dr. Sabatier establishes the reality of this influence without being able to explain it; but, for those who may attempt to give an explanation, and especially for those who cultivate photography, he calls attention to the following facts, the first two of which are, so to speak, but the corollaries of the capital fact established:—

1st. On the object-plate of his microscope, which he has blackened irregularly, he places a glass bearing a fly, and on the mirror situated immediately under the object-plate he puts a white paper, and then he takes the latent photographic picture of the fly. By proceeding in the operating-room in the manner described

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* The beauty of your tints will be considerably impaired if "teased," or, in other words, too much worked about with the brush.

† I always like to finish my picture when the sitter is before me: my pupils should adopt the same plan, as it is invaluable to beginners.

below he obtains, not only a positive of the fly, but also that of the irregularly-blackened object-plate. But if for the white paper that forms the ground of the little picture we substitute black paper, although the exposure be prolonged and the light be more intense, we obtain by the same process in the operating-room neither the positive of the fly or that of the object-plate.

Let it not be supposed that the substitution of a black ground for a white one has intercepted all light; for the fly and the object-plate were very well seen on the ground glass. On returning to the operating-room the collodionised glass remains white in spite of its undergoing operations suitable for developing a positive, whereas it becomes black when it has not received the luminous impression. If the positive has not been formed, it is because it could only be the consequence of a negative which itself could not be formed.

2nd. As soon as the negative is entirely developed the positive is no longer possible, the nitrate of silver, the ammonia and the lime-water have no influence upon the negative arrived at the perfect state.

3rd. The positive is not developed at first in the whole thickness of the collodionised layer: it commences at the surface in contact with the glass; for it is seen on the side on which the glass is, while it cannot yet be perceived on the opposite side, and the hyposulphite, by dissolving the iodide not acted on, renders it visible on both sides.

From what precedes, it results then that nitrate of silver can, with each of the developing agents, determine two successive combinations of different colours — the one tending to the whites of the pictures and producing a negative, the other tending to the blacks and producing a positive; that these two combinations depend one on the other to such an extent that the second commences very exactly at the moment in which the first is arrested; that the second takes possession of the whole space that the first leaves to it; and that lastly, the second becomes impossible as soon as the first is completed. The more white we develop the less black we shall have, and *vice versâ*. The important — the difficult thing is to appreciate the proportion in which the two colours must be employed, to seize the precise moment of arresting the formation of the negative, so that the light and the shade may blend the most harmoniously: certain details even will not be well rendered unless we let one of the colours predominate at the expense of the other. The new method will demand not only the experience and the dexterity of a clever operator, but also the knowledge and the taste of a true artist. Each object to be represented will require a special study.

As will naturally be supposed, the new process will in no respect modify the operations that precede the use of the developing agent; it merely requires the arresting of the positive at a moment determined according to the effect that is desired. For that purpose we wash away the developing solution with abundance of distilled water, and cover the glass with a light layer of nitrate of silver at 4 per cent. All this must be done very rapidly, because in consequence of the pyrogallic acid still adhering, the negative continues its development even under the flood of distilled water.

It has been seen that the mere contact of the nitrate sufficed for determining the formation of the positive. However, if care was not taken to pour upon the damp plate a small quantity of pyrogallic acid, the positive, for want of material, would come with difficulty, and would be well indicated only in the very dark parts. When the nitrate stays one or two minutes on the glass without this addition, the positive is produced instantaneously, and the whites lose their brilliancy; but, if the nitrate does but pass, as it were, to give place immediately to the acid, the positive is developed before your eyes, and with the greatest precision.

If ammonia or very feeble lime-water were employed instead of the nitrate, care must be taken to wash the glass with distilled water, after the contact of those two substances, and then to cover it with pyrogallic acid, to which has been added a few drops of nitrate of silver. But what especially must not be lost sight of is, that success is impossible when the baths contain the slightest trace of nitric or sulphuric acid. Preference will, therefore, be given to fused nitrate of silver, and, for bringing out the picture, to pyrogallic acid, which here again maintains its unquestionable superiority.

Direct positives obtained by this process are fixed, as are ordinary positives, with hyposulphite, and take, as do those, the tone we desire to give.

Although collodionised glass alone has been here spoken of, the process is equally applicable to albumenised glass. It would even be applicable to paper, if anyone succeeded in giving to paper some of the qualities peculiar to the substances which are poured upon glass; and that seems the more possible, as paper is the basis of collodion.

Dr. Sabatier gave me, with this communication, twelve pictures. They are of great delicacy, and, when seen with the glass, they show the smallest anatomical details of the insects portrayed: the delicate network of the wings of a fly is distinctly perceived in these transparent designs, and one might count the brilliant spots in the elegantly water-marked coats of certain other insects. What marvellous results Dr. Sabatier might obtain with Bertsch's photo-micrographic apparatus, which would give him a magnifying power of three or four hundred diameters! His collection, already so interesting, would become a real monument of science.

ERNEST LACAN.

☞ The Publisher, in reply to continual inquiries, begs to inform present or intending Subscribers to this JOURNAL that no difficulty exists to prevent its being received on the respective days of publication (viz., the 1st and 15th of each month) in any part of Great Britain and Ireland. It is printed in sufficient time to be despatched by the Publisher, Liverpool, or by the London Wholesale Agents, so as to reach the most distant Subscribers and Agents on the above days. Orders sent direct to the Publisher, accompanied by a remittance (if by post-office order, made payable to Henry Greenwood, 32, Castle Street, Liverpool), or to the London Wholesale Agents, Messrs. E. Marlborough and Co., 4, Ave Maria Lane, E.C., will receive immediate attention. Foreign Subscribers and Agents can also be supplied in the same manner by paying the additional postage charged by the Post Office. Orders given through Country Booksellers are carefully executed by Messrs. Marlborough and Co., as above, or by the Publisher, Liverpool.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

ON ALBUMENISED PAPER AND THE ALKALINE GOLD TONING.

To the Editor.

Sir,—Having of late seen numerous complaints in your Journal and other photographic papers in reference to the above, we beg to offer a short sketch, and to state that the first principal cause of failure is due to the system of cheapness. If the dealer will but give a fair remunerative price for a *genuine* article, we feel certain most, if not all, these complaints would cease. But the purchaser should at the same time state by what process he intends working, and what result he desires.

The second failure is due to weakness of silver bath, and further caused by the addition of too much carbonate of soda to the gold solution, thereby removing or partially dissolving the albumen, causing minute red specks or streaks partially or all over the picture: thus the proof paper is condemned as *bad*. This has always been remedied by reducing the amount of soda.

We prepare the negative and positive Saxe papers *only*, and we will warrant them to be the true Saxe, and purely albumenised. Our salted we specially prepare, and find them equally adapted for the old method (to those who prefer it) as the alkaline.

As a proof thereof we shall be happy to supply the same to purchasers (*vide* advertisement), and to exchange it, if not approved, provided the fault is on our side; and, further, we will personally (within reasonable distance) work it in their presence, at their residence or ours.

In conclusion, we desire to add that, in our humble opinion and experience of some years' constant practice, no other paper is equal to the Saxe. It is uniform in its results and general freedom from metallic spots, &c.; and any desired tone can be obtained at the will of the manipulator.

We in no way, however, wish the above to be understood as deteriorating the value of other papers, as each are good for their particular purpose.—We are, yours, &c., HOPE & CO.

Verulam Terrace, The Grove, Hammersmith, London, W., September 26, 1860.

ARCHER'S FLUID LENSES.

To the Editor.

Sir,—If "W. Anderson," who inquires in the last number respecting the repairing of an Archer's fluid lens, will refer to page 220, No. 80, of the *Journal of the London Photographic Society*, I think he will find the information he requires.—I am, yours, &c., J. N.

October 1*st*, 1860.

[We are obliged for the reference given, where we find that Mr. Isaac Yeoman states that the fluid consists of a mixture of nitric, sulphuric, and hydrochloric acids.—Ed.]

WHY?

To the Editor.

Sir,—I am one of those who like to know "the reason why," and shall feel very much obliged by your answering the following queries in the next number of your very interesting Journal, every number of which I read with much pleasure:—In the Fothergill process, why do some (Ackland, Keene, &c.) use a "*chloride* of ammonia solution" with the albumen? For what purpose? And did Fothergill use it originally?—In your own editorial comments you recommend "citrate or phosphate of soda" to the albumen. Why?—With regard to washing *more* or *less*, it is a matter of opinion, and therefore I make no inquiry. Miss Bahr seems to well wash. I wonder would she have any objection to give her process *in extenso*, through the medium of your Journal. If she succeeds so well as is reported, why not let us have the *modus operandi*—viz., what ingredients she uses, &c.?

Of what *advantage* to photography is the *interesting* discovery of Petschler and Mann? I think, Sir, we should all endeavour to simplify the processes as much as possible, and particularly the *dry* one. Now, the three following all require *re-sensitising*—viz., Taupenot, Petschler and Mann, and *Macnair's* malt one, as he *re*-dips his plate *in* a bath of *nitrate*. Thus we have additional trouble and expense; whereas, in Hill Norris's and Fothergill's we have nothing to do but *develop:* consequently, I am of opinion it is throwing away time and paper trying to make out a *merit* for any other process which requires either re-dipping or re-sensitising. I trust Dr. Norris will give to the photographic world the benefit of his last most important and valuable discovery, which appears the long lost *link* in the chain now recovered. Excuse the length of this.—I am, yours, &c., INQUIRER.

[The addition of a chloride to the albumen is intended to convert any free nitrate of silver into chloride of silver It is alleged that increase of sensitiveness is gained thereby; and certainly the plates keep longer without deterioration than when a chloride is omitted. We recommend the substitution of a citrate or phosphate, because these salts subserve the same purpose as the chloride. But development of the image is easier when these latter are used, and, what is more important, the density of the picture is at least as great as when plain albumen is employed, which is not the case (in our experience) with the chloride. We believe that the lady you mention is at present on the Continent. The advantage of Messrs. Petschler and Mann's discovery is, that plates prepared by their method can be kept *indefinitely*, and are rendered ready for use by a process (simple washing in water) that can be employed under almost any circumstances.—Ed.]

BEGINNING TO "TAKE NOTICE."

To the Editor.

Sir,—The "Babe and Suckling" to whose inquiries in your 122nd Number, relative to portraiture in a sitting-room, you were kind enough to reply, is developing into a promising child. He has cut his teeth, and was just getting on his legs; but, having had an attack of measles, or some such spotty complaint, on his face (photographic), he has had a relapse, which has again plunged him into a sea or rather bath of troubles. Listen to his complaints, prescribe a remedy, and merit the thanks of

October 11, 1860. THAT BLESSED BABY.

1. That side of the face next the reflecting-screen has a mottled appearance in the finished picture.

2. The pictures latterly are dotted over with very minute ragged-looking holes; and the collodion film, when sensitised, seems weak and not creamy.

3. Why don't you give us a glossary of mischances and failures, dedicated to photographic dunces, who, I guess, form the vast majority of your readers (no offence)?

[1. Do you take glass positives or negatives? We can assign no cause for the mottled appearance from the data with which you furnish us.

2. The holes may arise from some fine precipitate in the bath—remedy, filtration; or from the bath not being saturated with iodide of silver—a plate left in for an hour or so will cure that; or from preparing your developer with common instead of distilled water. If you are taking glass positives, the film should *not* be creamy; if negatives, add more iodising solution.

3. Because we find it better to meet actual difficulties when they arise than to anticipate failures which may never occur. You are quite in error as to the supposed class of the majority of our readers.—Ed.]

FREE NITRATE OF SILVER AND DRY PLATES.

To the Editor.

Sir,—I cannot reconcile with Dr. Hill Norris's theory—that free nitrate of silver *retards* the sensitiveness of iodide of silver in our processes—the fact that Fothergill plates, from which all free nitrate has been removed by copious washing, are less sensitive than those which are suffered to retain a very considerable trace. Am I not right in speaking of this last as a fact? Can you explain why, in Mr. Petschler's process, the plates do not admit of being stained during development?—I am, yours, &c., F. C.

[There is no antagonism in the two cases. All nitrate of silver left on the "Fothergill" plate is certainly combined with the albumen and what it holds in solution prior to the final washing; and moreover, it is found that the addition of an alkaline chloride, phosphate, or citrate (thus ensuring the absence of the last traces of *free nitrate* of silver), increases the sensitiveness.

We are not prepared to admit that there has been any definite proof of the alleged fact that Fothergill plates, from which free nitrate of silver has been as much as possible removed from them prior to the addition of the albumen, are less *sensitive* than others. It may be so, but the actual proof is wanting; for difficulty of developing the image is a very different thing from its absence, which may be apparent only and not real; and there are many facts, which are indisputably established, rather tending to indicate that an impression is really present, requiring only judicious treatment to render it visible.

We do not precisely comprehend what you intend to convey by the last query. Do you mean to assert that it is impossible to stain one of Mr. Petschler's plates?—Ed.]

THE OPTICAL GHOST.

To the Editor.

Sir,—In the illustrations of the interesting article on the late solar eclipse, contributed to your Journal of September 1st, by Mr. Charles Heisch, there appears a second or ghost image. It seems to me to be simply what we call the optical ghost, which presents itself very distinctly in a darkened room when you try to get the focal image of a candle on the wall by means of a lens. You have only to fancy the moon the candle, and the comparatively darkened earth the dark room. You will then have very little difficulty in tracing a great similarity. Some persons may ask—How do you account for the ghost's non-appearance in No. 1 diagram? The answer is, simply, that ghosts prefer the dark—or, in other words, the room or earth was not dark enough to show up this faintly-illuminated image.—I am, yours, &c., H. FRANCIS.

[We believe that what our correspondent denominates the *optical ghost* is only existent when an imperfectly-constructed lens is employed. —Ed.]

ANSWERS TO CORRESPONDENTS.

Erratum.—In the report of the meeting of the North London Photographic Association, in our last, 30th line from foot, for "construct" *read* "constrict."

M. Noton.—Received with thanks.

Photo.—About a week in summer.

Martha.—They are now under review; particulars in an early number.

J. (Torquay).—You should visit Dartmouth: you will find there several subjects of the class you seek.

Thomas L.—We cannot recommend the practice you mention, as it throws the nitrate bath out of order.

Brentwood.—Good friend, you have forgotten to let us know where to address to you. As you are not a resident there, the name of the place alone is not sufficient.

Gavazzi.—We cannot give you the names of Italian photographers, but have no doubt you could obtain the information from Messrs. Colnaghi and Co., Pall Mall, London.

3. Copying by contact involves the necessity of adhering to the same *scale* as the original. We see no objection to intensifying a dry plate by the bichloride of mercury, if you find it needful; but we scarcely think this will be requisite with a dry plate.

J. R. F.—We cannot undertake to do what you request. We have no time to spare, and we do not consider that the principle involved is sound; consequently, are not inclined to waste materials and, what is more important, labour over what we think ought not to succeed.

Stereographs.—Several correspondents who have favoured us with specimens for review will please to understand that they are in course of undergoing that process, unless they have received *private notes* explaining the defects which preclude our noticing them in our columns.

B. C. A.—Having added the "bottoms" of your partly-used bottles of collodion together, thin the collodion with a sufficiency of ether three parts, alcohol one part. It does not require any more iodising solution; and the quantity of the above mixture depends upon the fluidity required.

Acme.—We have every reason to believe that the process adopted in toning the beautiful specimens you name is the *simple alkaline gold toning*—indeed we have no doubt of it. The reason that you have been unable to produce similar tones may be in consequence of your not having used the same kind of *paper*.

G. F. W.—1. Yes; but the amount of subject included will be very small—in other words, the *angle of picture* will be very limited, the scale of delineation being great.

2. We do not quite comprehend this question: you do not say to which *figure* you refer.

3. Maxwell Lyte's.—Thanks for your good wishes. We do not think, however, that there is any real demand for what you suggest, but you can talk to the Publisher about it if you like.

C. H.—Copying from an engraving upon a dry plate by superposition and exposure in the pressure-frame is not very frequently resorted to, for the following reasons:—

1. Liability of injury, both as regards the plate or the engraving, or both.

2. In order to get the best effect this way it would be needful to wax the engraving, to render it more transparent, as the inequalities of thickness and grain of the paper would otherwise interfere with the perfection of the results.

J. H. Slater.—The diameter of a view-lens has very little to do with the best position for the stop, which is determined by the *oblique* pencils of rays; for on the direct central ones the stop exerts no influence, except to limit the diameter of the pencils. The best position is most easily ascertained by experiment, and this has most probably already been done by the optician who made your lenses. The further from the lens the stop is placed, as a rule, the flatter will be the field, but the more the distortion at the margins of the picture, and *vice versâ*.

No Chemist.—Thirty to thirty-five grains nitrate of silver to the ounce of distilled water—in fact, an ordinary collodion sensitising bath. The albumen:—White of egg three parts, water one part, ten minims of ammonia, and two grains of chloride of ammonium to each ounce of the above, well frothed and filtered. The ordinary pyrogallic developer, or pyrogallic acid two grains, citric acid one grain, water one ounce, or gallic acid to saturation. A few drops of nitrate of silver solution to be added to the developer just before use. An iron developer is not applicable.

*** We have been obliged, from want of space, to postpone No. III. of Mr. C. Jabez Hughes's admirable series of articles—*Observations on Albumenised Paper and Alkaline Gold Toning*—till our next number. From the same cause we have also been compelled to omit a number of advertisements.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 129, Vol. VII.—NOVEMBER 1, 1860.

The unfair and ruinous competition with the photographic publishing trade carried on by the Department of Science and Art at South Kensington, to which we referred in our last, has elicited expressions of opinion singularly in accordance with our own view of the subject from several correspondents located in various parts of the kingdom, while in no single instance have we received anything approaching to an attempted defence of the conduct of the "authorities" in the establishment of which we complained. From Mr. Coningham, M.P., we have received an article on the subject, written before the appearance of our last leader, but with which we have been favoured in consequence. Mr. Coningham's arguments coincide in a remarkable manner with those which we advanced on the various points involved in the question at issue, as our readers will doubtless perceive on comparing the two—an opportunity of so doing being afforded by the publication of Mr. Coningham's article in the current number. It is always gratifying to find one's view of any debated question corroborated by others who have also carefully considered it, but still more so when such an occurrence arises amongst those who from their position and energy are likely to afford material assistance in procuring a remedy for the evils sought to be removed. We have already remarked that the attempted interference with the legitimate business of photographers will, if not duly checked, in all probability prove but the precedent and stepping-stone to still further aggression directed against those following other branches of business. It therefore behoves all persons, whether personally interested in photography or not, to aid in putting a stop to the injustice. But we believe that the proper course of proceeding would be for the photographic profession to take the initiative in resistance.

Amongst the curious signs of the times in which we live we may now surely reckon the wide diffusion of the race of photographers. It is indeed not a little difficult to state positively where they have not been found. China, Japan, the Philippine Islands, the Holy Land, Egypt, amongst the warmer latitudes, have all furnished their records photographic. New York, the Canadas, the Alps, have been some of the colder regions explored. Besides all these we have illustrations of Russian, French, Italian, German, and Spanish scenery, both urban and rural. We have just heard of a new series of a highly-interesting character from Cuba, in which the various operations carried on in the sugar and coffee plantations are faithfully portrayed. Lastly, we have been informed of the safe arrival in Iceland of a gentleman who accompanied the North Atlantic Telegraph Company's expedition in the *Fox*. We learn, too, that he has taken numerous stereoscopic groups of the Icelanders, as well as views of different parts of the island. We believe that he received instruction in photographic manipulation from Mr. Quin.

Our readers are already familiar with the application of photography to the purpose of recording the variations in terrestrial magnetism, from a perusal of papers on the subject by Mr. Glaisher, read at the meetings of the Blackheath Photographic Society. At the last ordinary meeting of the Manchester Literary and Philosophical Society the President exhibited a slip of paper which he had received from Professor Thomson. On the paper was printed by photography the line indicating the various changes of atmospheric electricity which took place at the observatory of Kew during twelve successive hours. Much interest was excited by witnessing one of the first fruits of Professor Thomson's beautiful instrument. The paper indicated a series of very rapid oscillations, about one per minute, of the intensity of atmospheric electrical force.

In the report of the last meeting of the South London Photographic Society, which will be found in the usual column, we were not a little surprised at finding it stated, in reply to the question, "How they could tell when the axis of a lens was central?" that it was a "trade secret—one of the important secrets only known to a few!" Surely the gentleman who made such a reply must have been joking. However, be that as it may, we cannot possibly allow such an assertion to appear in the Journal under our supervision without comment, feeling assured that there are many of our readers quite sufficiently acquainted with the subject to have a laugh at our expense were we to let it pass unnoticed. Trade secret or not, then, we must certainly explain the method of ascertaining the point, which is as follows:—

While the brass mounting of the lens is still in the lathe, and the lens itself inserted, a lighted candle is placed at a distance, in the direction of the axis, without any particular regard to accuracy of position. A piece of white card is then held behind the lens, so as to get the image of the flame in pretty correct focus: then by causing the lens to revolve in the "mandril," by simply working the "treadle," it will be at once seen whether the lens axis is properly centred; for, if this be the case, the image of the flame will remain *perfectly stationary*, notwithstanding the rapid revolution of the lens—if not, the image will have a rapid flickering movement, the amount of which *increases* in direct ratio with the eccentricity of the axis. The same test applies also to the double combination; but in this case any eccentricity is of far greater importance, because infinitely more detrimental than in a single combination. In the latter slight eccentricity is of little consequence; in the former it would be fatal to anything like correct performance. It must be borne in mind that, in examining a lens for this quality, after it has been removed from the lathe in which it has been finished, care must be exercised in order to ensure its being properly screwed into its place of adjustment, as otherwise the error of adjustment in position will give the appearance of its being improperly centred; and here again the portrait combination requires more care than that for views—the test applied being, in fact, to the *axis of the lens* with reference to the *centre of motion*.

We have to remind our readers that the time is approaching when such as may contemplate contributing to the various photographic exhibitions should commence making their preparations. The London Society will, we believe, as usual,

make arrangements for opening in January, and the Scotch Society in February next. Our Manchester friends have fixed the period of the meeting of the British Association for their display, so that a wide interval will elapse between these events—certainly not to the disadvantage of either. From an advertisement in another page it will be seen that all pictures intended for the next Exhibition of the Architectural Photographic Association should be sent to the curator, Mr. Henry Moody, 9, Conduit Street, W., on or before the 5th instant.

It has frequently been supposed that the Photographic Society sustains a loss in being obliged to hold its exhibition during the winter months, but we are certainly not convinced that there is any real ground for this idea; for besides thus avoiding competition with many other exhibitions of a class more attractive to the general public, such as those of the Water Colour Societies, the Royal Academy, &c., we must not forget that photographs are objects that require very close inspection in order that they may be appreciated, and this of itself alone involves the devotion of a considerable amount of time. Now in cold, dull weather, when there is not much attraction out of doors, a large number of people not otherwise likely to visit a photographic exhibition will probably be induced to do so, and, as the experienced coquette used to remark, "if they can only be induced to *look*, conquest is sure to follow."

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 14.

Photographic Journals are expected to contain information conveyed in a light and easily-digested form, and are, therefore, placed upon the breakfast table side by side with the morning papers and other periodical literature. One opens the Journal expecting to be refreshed by a perusal of what the brethren in the art are doing, and hopes to find everything going on comfortably. It occasionally happens, however, that these expectations are not fulfilled, and that a paragraph meets the eye which is decidedly unpleasing. This was the case with an address lately given by the President of the Chorlton Photographic Association, in which our own name appears in connexion with collodion. One principal object of the address is to complain of the imperfect state of the chemical science of photography at the present time. Now, judging from our own experience, we should be inclined to say that such addresses exercise a prejudicial effect, and that they tend very much to lessen progress. Something, no doubt, depends upon the temperament of the individual, since there are sanguine spirits who refuse to see any difficulties when they are interested in an undertaking. Minds of a different turn, however—and we suppose that the Chorlton Association includes some of these—require encouragement, and the only sure way of urging them forward is to tell them that they are gradually nearing the mark, and by sustained efforts may eventually hit it. Whilst allowing that there are many things in photographic chemistry of which we are yet ignorant, it is consoling to us to reflect that we know more than we did formerly, and that ten years hence will probably see us still further advanced. Mr. Griffiths will pardon us for taking up this question and endeavouring to show that it has two aspects, and admits of being seen from a cheerful as well as from a desponding point of view.

Supposing the president of a medical society were to open a session by an introductory lecture on the present unsatisfactory state of our knowledge of medicine, no doubt arguments in support of his assertions would soon be forthcoming. It might be said, for instance, that although the healing art had been practised since the days of Hippocrates, the true principles upon which it ought to be conducted were even now imperfectly understood. Patients in fever, formerly treated by low diet, were now "supported" by stimulants until the poison had been burnt off and exhausted. Other patients, labouring under diabetes, or a flow of saccharine matter, were by some denied the use of sugar and by others almost surfeited with sugar, and yet, strange to say, the patients were in both cases stated to have experienced relief. Such perplexing differences showed clearly that there was not that concord amongst medical men which could be desired.—Now, the reply to an address of such a kind would be, that we must not expect too rapid an advance in medicine. The profession is one of great difficulty and embarrassment, so that we are satisfied if we get forward by a single step at a time, and are content to observe differences of opinion lessening, even although they do not immediately disappear.

To compare the study of photography with that of medicine may by some be deemed an exaggeration, and doubtless it is so; for the conditions affecting the issue of an experiment are vastly more complex in the latter case than in the former, and it requires more shrewdness and discrimination to trace effects to their real causes. Photography, however, is remarkable for the minute and patient attention it requires to unravel its mysteries. This even chemists themselves acknowledge, and desire that it should be separated off as a distinct branch of the science, occupying the undivided attention of those who pursue it. Without the exercise of extraordinary care, observations in photography are of small value, although they are given on the authority of a good name. Dr. J. Schnauss, for instance, is known as a skilful chemist; yet when he conjectures that all preservative organic substances act in the same manner, we cannot but refuse our assent to such a statement. If the doctor were to investigate the subject with that care which he gives to his more purely chemical researches, he would see that it is not so. And supposing him to be wrong in his ideas, of which we entertain no manner of doubt, then his subsequent remarks on the vanity of little people who hasten to rush into print are entirely out of place.

When photographic societies make their annual report, there is cause for congratulation if a single new principle has been enunciated during the session, or some annoying failures traced to their proper source. Other matters perhaps have not been settled to the satisfaction of all, and lookers-on are amused at the perplexities of the photographers. Who shall decide, say they, when the doctors disagree? We reply that *time* will decide, and that those who are confident as to the goodness of their cause, must wait quietly and expect in the end to be established. Latterly we have been reading M. Monckhoven's work on photography, and are surprised to find that in France they do not adopt Mr. Hadow's views on the composition of pyroxyline. This, however, will not disturb us in our previous convictions as to the soundness of those views: on the other hand, we continue to believe in them most fully, and expect that all will eventually acknowledge their truth.

Again, the value of researches in photography is underrated by those who refuse to see in them anything more than a mere formula or recipe. This formula they try, possibly without success, and if so, they conclude that the whole argument which led to its construction was unworthy of attention. A deeper study would, perhaps, have shown them that it contained more than they imagined, and professed to explain not only what should be done, but what should not be done. For instance, on consulting the index of a volume now lying before us, we find an article, by Mr. Sang, on photographic varnishes. Mr. Sang speaks of six different varnishes which he finds unsuccessful, but cannot tell us the composition of the one which answers. Now, some would condemn this communication as incomplete and useless, but we do not agree with them in so thinking. The analysis of a varnish is uncertain; and next to a formula which succeeds, the second best thing is to know the composition of several others which do not succeed. As with varnishes, so with collodion: it has become almost a fashion to say that we understand very little about it; and that no formula, however carefully followed, will give uniform results. Let the operator, however, dismiss from his mind all ideas of actual weights and measures, preferring to depend upon a theoretical study of the subject in all its bearings, and we can promise him that he will be in a position to prepare any quality of collodion that may be demanded.

Mr. Griffiths will not see, in these comments, evidences of a hostile spirit directed against himself, but rather the sentiments of one who, having devoted some years to the study of photography, is unwilling to believe that the science is in the deplorable state represented. All labourers in this department of chemistry are sensible of the difficulties which stand in their way, and will urge them in extenuation of the charge of want of progress.

OBSERVATIONS ON ALBUMENISED PAPER AND ALKALINE GOLD TONING.

By C. Jabez Hughes.

No. III.

Albumenised Paper.—Photographers are not agreed whether the best albumenised paper is that which has the highest gloss. The majority certainly run after the glitter; but the old proverb holds good again, for the most perfect paper cannot be made to take the

same high glaze that some inferior ones do. This rage for gloss has a great tendency to drive albumenisers to adopt some of those tricks they have recently been charged with — of using gelatine, stale eggs, and other objectionable means to produce this strong glaze. Admitting that albumen-brilliancy is desirable, its production should only be by legitimate means. An intensely high glaze is not the only thing needful in an albumenised paper. This fact cannot be too strongly insisted on; and photographers must be made aware that albumenisers cannot give any glaze they please indifferently on all papers, and that some very good papers, though taking a very high surface, will not compete in that respect with the commoner and, in other respects, inferior French papers.

Albumenising paper is an operation requiring great care and *knack*. In consulting with several who do it on a large commercial scale, I find they have few or no secrets. Their success lies in that careful manipulation acquired only by considerable practice and experience. For the supply of eggs they depend on the egg merchants; though I know one party who uses only fresh-laid eggs, and he charges many of the defects of the common albumen to the foreign eggs being packed in lime, which, permeating the porous shell, acts on and injures the albumen, the presence of the lime, according to the statement, being evident in the taste of the albumen. The quantity of eggs consumed in preparing photographic paper must be very great. In one establishment I recently saw a box containing 1100. I was assured that two of these were used every week. This would give upwards of 114,000 per annum used by this person alone!

When the highest glaze is wanted it is the practice to add no water whatever to the albumen: the crystals of chloride of ammonium or sodium are added and beaten up with it, and thus made to dissolve. When it is in the condition to be used — some use it when a day old, and reject it at the end of a week; some begin to use it only when it is a week old — it is placed in dishes larger than the whole sheet of paper: the sheets are carefully floated, and then hung up to dry in a warm place. The rooms where the albumenising is conducted are kept at a high temperature, it being a most important circumstance to dry the sheet as quickly as possible after taking it from the albumen.

Chlorides of sodium and ammonium are each used, and it is believed that there is not much difference. On plain paper the nature of the chloride is of consequence in affecting the tone; but with albumenised paper it is thought that this effect is practically ignored by the influence of the large amount of albumen. Chloride of barium I do not find in general use.

There is a considerable agreement about the quantity of salt to be used. From ten to twelve and a-half grains per ounce is considered the proper quantity. One party, however, uses fifteen grains. The sixty-grain silver solution will therefore be about the strength required for nearly all papers.

For those who wish to albumenise their own paper, the operation is as follows:—Obtain as many eggs as are required ounces of solution to fill the dish to the depth of half an inch. Break the eggs individually in a cup, being careful not to disturb the yolk; then extract the germ, and pour the albumen in a large vessel to be used for beating it up. By treating each egg alone, any one which may have the yolk broken, or that is not good, can easily be rejected, for one bad egg may spoil the whole batch. Next add chloride of ammonium, ten grains for each egg. Dissolve the chloride in as little water as it will take up, and add it to the albumen: beat the latter till it all becomes a stiff froth, and not a drop of fluid remains. Allow it to remain for twenty-four hours, then pour it through a fine muslin into a shallow dish. Float the paper carefully on the albumen so as to avoid air bubbles: this is the most delicate operation, and great *knack* is required to do it properly; for if an air-bubble once occurs, although it may be removed, it will always show in printing, therefore the sheet must be so laid down that none be formed. The length of time the sheet must remain on the albumen depends on the kind of paper. Generally it is from sixty seconds to two minutes. If the paper remain too long the albumen sinks deeply, and the surface dries dull. In lifting the sheet off as much skill is required as in laying it on. It must be lifted with one steady regular motion, any hesitation or stopping causing a streak or series of streaks. The sheet must be suspended by *two* corners, so that it may drain and dry in a uniform manner. When the albumen is set the sheet may be dried by the fire: the quicker it is dried the greater the glaze. When dry the operation is, strictly speaking, finished, and the paper ready to be silvered for printing; but, as usually prepared for commerce, it passes through another operation — that of *pressing*.

Formerly it was thought necessary to smooth the paper with a hot iron to coagulate the albumen prior to sensitising, and as this was inconvenient on a large scale, it was sent to the *hot-presser's*. Though it has since been discovered that the silver solution itself sufficiently coagulates the albumen, yet the pressing — now cold pressing — remains.

This process the albumenisers cannot manage themselves, but send the paper to the card glazers', who, for a small charge, do it for them. The operation is simple. Two highly-polished steel plates, kept expressly for this work, are provided, and two sheets of albumenised paper, back to back, and albumenised surfaces to the steel plates, are placed between them. They are then put under heavy rollers and submitted to powerful pressure. This takes out the *curl* the paper gets from albumenising, and causes it to lie flat. It also communicates a peculiar gloss and apparent fineness of surface, which is, however, purely artificial, and disappears when wetted; and it is worth while considering whether photographic paper should pass through this operation. It is a question of advantage and disadvantage. By the process of pressing the paper loses its *curl*, acquires a delusively fine face, and lies invitingly smooth in a tradesman's drawer; but for practical ends its sole and only recommendation is, that it lies more easily on the silver solution.

The disadvantage of the pressing is, that the paper passes from those who understand it and are interested in keeping it clean and perfect, into the charge of careless boys, who handle it with dirty hands; that particles of dust and dirt that adhere even to polished steel plates are ground into the surface; and that often the albumen itself is much injured in the rolling, sometimes literally crushed, to the entire prevention of getting a good print, through too much pressure being used. Is it desirable, for so small an advantage, that so much risk should be run? I think not. Some persons who prepare a great deal of paper have set their faces against it, and will not have their paper rolled. Others laughingly say, "the public like it — are tickled with a shining face; that high glaze, like charity, covers a multitude of sins; that though it is little else than a sham, let them have it who know no better." The grain and structure of a paper is very much opened up in albumenising, so that its nature can be judged; but, if it be pressed, an apparent fineness is communicated that cannot be relied on, and one means of forming an estimate is removed. Nearly all the finger marks—how frequently a fine and unnecessarily perfect representation of the whole five digits!—are attributable to handling with dirty hands during the pressing operation.

I strongly recommend photographers to discontinue the use of rolled or pressed paper.

When the printing is all over, and the picture mounted on card-board, *then* is the time to press it, and take full advantage of the fine surface to be communicated.

Is gelatine used by albumenisers to give increased glaze to their papers? The assertion is frequently made, and there may be truth in it; but, from inquiries I have instituted in very many quarters, I can get no evidence of it. The nearest approach is the practice, said to be adopted by one party, of sponging his sheets of paper, first with a weak solution of gelatine, then having them pressed, next albumenising, and finally pressing again; but this operation is only equivalent to giving the paper an extra sizing to create a harder surface, so that the albumen, by being more superficial, will give greater glaze. Those who adopt adulterations generally do it for cheapness; but any paper passing through a double operation of this nature must be enhanced in price.

I have certainly met with papers, albumenised in France and sent to this country, that have had a very suspicious odour; but I think the practice of all respectable parties in this country is to use albumen only. Albumen is, however, used in different states. When newly prepared it does not give such high glaze as when it is older. If albumen prepared yesterday be used to-day, it will not give much glaze—it sinks into the paper: to-morrow it will do better: in three or four days time it will be in first-rate order. This, however, depends on temperature and period of the year. One of the troubles of the albumeniser is the keeping his albumen in order, and when it is in its best condition, to use it up as rapidly as possible. Some persons keep their albumen for a fortnight or more before they use it—the object being to concentrate it, to evaporate the water from it, and make it thick; and in this state it will give a very high glaze upon even a porous paper. But this is certainly pushing things too far, and the paper will show it; for instead of being white it will be decidedly yellow, from the thick layer of decomposed albumen. When paper prepared in this manner is moist, both the colour and adhesiveness of

surface would lead a person to think that *gelatine*, and not albumen, was the substance employed; and in this way I account for the outcry, which should be against decomposed, stale albumen, and not against gelatine. This is but an instance of extreme means being adopted to minister to the rage for the intensely highly-glazed paper.

I think the knowledge pretty generally exists now how to obtain the highest glaze by perfectly legitimate means.

It is, in the first place, to secure good albumen; to add no water to it, or at most barely enough to dissolve the salt; to beat it so well that it shall not hold in suspension any membraneous portions causing bronzed lines; to use it when it is in its best condition—not so old as to be thick and yellow, nor so new as to appear diluted with water; to lay the paper on the albumen the shortest time consistent with obtaining a uniform film, and to dry it as quickly and as uniformly as possible afterwards. These are the conditions to albumenise paper well; but, simple as they may appear, it requires great experience and tact to apply them to practice. The albumeniser is always troubled with his papers,—different samples requiring slightly different management. Speaking generally, the English papers absorb the albumen and become rough on the surface, drying without much gloss. The Saxe papers may by dexterity be got to receive a very fair glaze; but the Rive seems merely to hold the albumen on the surface, and its highly-varnished appearance would hardly be judged as being obtained from the same treatment that gave only a moderate glaze to the German, and even a dull look to the English paper.

OBSERVATIONS IN REPLY TO THE REPORT OF THE SELECT COMMITTEE ON THE SOUTH KENSINGTON MUSEUM.

By William Coningham, M.P.

"Whatever rules may be adopted with respect to photographing pictures or works of art belonging to the public, the department should not enter into competition with the general traders."—*Mr. Joseph Locke's rejected amendment to the Report.*

Now that the doors of Parliament are safely closed, the evidence upon which was founded the report of the select committee on the Kensington Museum has been tardily placed in our hands. I deliberately assert that had that evidence been attached to the report, the instalment of £17,000 voted for the alterations at Kensington, with an "approximately estimated" expenditure of £27,000, would then with difficulty have been carried through the House of Commons.

The history of the Brompton boilers, the annual cost of which in coal alone is admitted to be "monstrous," may be thus briefly told. Founded by the Great Exhibition Commissioners of 1851, repudiated by Sir Benjamin Hall on behalf of the Board of Works, erected by "orders" from Sir William Cubitt "out of benevolence, as it is said, to the commissioners," of whom Sir William was himself one, the Brompton boilers were built, and built of corrugated iron; and it is now admitted on all hands that ever since their erection they have been a nuisance to every one connected with them. Impossible to be warmed in winter with ever so "monstrous" an amount of coal!—leaking, as Mr. Cole "impartially" admits, "everywhere," and at an original cost to the State of £15,000, with prospective illimitable expenditure *in futuro*, the boilers were ultimately handed over to the Department of Science and Art. By the removal of the schools from Marlborough House the country was saddled with some additional thousands. But the Commissioners of Patents were already in possession of a portion of the edifice, and very properly objected "to the taking of any fees at the doors" of a public museum. Unlike the officials of the National Gallery, the Patent Commissioners refused, point blank, to levy toll on either rich or poor, and demanded and obtained a separate free entrance.

The department, therefore, came into possession of the iron building with its "contingencies;" but it was opened to the public according to South Kensington Museum rules, which are framed in direct opposition to the resolution of the Trustees of the National Gallery, "that arrangements for the easy and free access of the public at all times and under all circumstances to the pictures of the National Gallery—*are absolutely essential.*"

The constitution and pretensions of the Kensington Museum are exceptional, and its assumed functions entirely differ from those of the National Gallery and the British Museum, which appear to be limited to the public exhibition of works of science, of art, and of literature, or at all events to a proper control and direction in their use. The Kensington Museum, on the contrary, professes to superintend, to direct, to teach and give prizes, of which it is, at second hand, the manufacturer, to compete with the general trader in his own special business; in short, to interfere in every possible manner with all that concerns the art and scientific schools connected with the department. It is, moreover, a scarcely disguised advertising centre for all inventors, traders, and manufacturers, and an active competitor in an artistic branch of industry, and thus the department has come into collision with the private and legitimate trade of the country, which finds itself crushed with an instrument, to the production of which it has been compelled to contribute, in the form of imperial taxation—a system calculated to sap public morality and the independent spirit of the people. The sum of money in question may appear small in amount when contrasted with the national expenditure; but in the consideration of this subject an important principle is involved, namely, "how far, if at all, is it expedient for the Government to trench upon private enterprise either in the training and education of the people or in the trade and manufacture of the country?" The aim and object of Mr. Cole may best be defined in his own words, wherein he explicitly states that "by these means we place objects of the highest art within the reach of the poorest person." But why alone "objects of the highest art," for which the poor do not care, and which they cannot appreciate? For the same reasoning would equally apply to objects for which they do care, and which they can appreciate: such as beef, beer, warm clothing, and good wages. Again, if the possession of, or access to, objects of "the highest art" be so desirable, why remove the national pictures from Trafalgar Square, where the public are admitted gratis, to the Museum of Kensington, where, on three days in the week, the poor man, should he desire to see those works of high art, to the purchase of which even he or his forefathers have in some shape contributed, has to pay a fee of sixpence at the entrance door? With such facts before us the hollowness of these high-sounding phrases is transparent. The Kensington Museum system, in my opinion, contains within itself the germ of almost every objectionable form of Government interference with private enterprise, gradually substituting, on a colossal scale, the unhealthy and exploded principle of protection for that of salutary competition and free trade.

Mr. Cole's plea for the photographic reproductions is, that "either the department must be a trader or the public cannot have the copies"—an argument which would justify the interposition of the Government in every case in which the public could not obtain that which it desired, a proposition so monstrous as to refute itself; and I assert, moreover, from the experience we have had of the working of all Government departments, that, in the long run, the public would be far better supplied by private enterprise than by any artfully devised scheme of Government administration.

But the Department of Science and Art does not confine its trading operations to photography, it extends its greedy clutches to the electrotype process, and has its own school prizes made by its own manufacturer; for in this case, it appears, according to Mr. Cole, to be "necessary to have a man in whom you have confidence," otherwise he might "depreciate" the work. But why should Mr. Cole object to the work being made cheap and accessible when in the next line he proposes "to place objects of the highest art within the reach of the poorest person?" As a saving clause this Protean head of the department professes not to enter into "the trade" of this reproduction (electrotype) "as we do in the case of photographs." Again, I ask, why not trade in electrotypes as well as in photographs? Has the department no other near relative in that particular line of business?

Next as regards the salaries of officials at the Kensington Museum. The annual expenditure of the department amounts to no less than £60,415; of this sum £33,675, or more than half, is devoted to the salaries of officials, yet I find Mr. Cole bitterly bewailing the inadequate remuneration of the purchasing superintendent of the art collections, whose salary, now amounting to £460, rises to £500. "His case," says Mr. Cole, "has been brought before the Treasury repeatedly by the board; but owing to the suspicion we are under at the South Kensington Museum, the Treasury have declined to consider his claims." Mr. Cole further adds that, "in every purchase he (the superintendent) has made, he could have sold them again at a very increased profit, owing to his keenness and judgment. I think he is most unjustly treated." Mr. Cole thinks this gentleman ill used at a salary of £460, rising to £500; and that he would do wisely, "if it were merely a question of making money," to resign his office at the Kensington Museum, "as in a very few years he would make his fortune as a dealer;" but having "grown up from a student in the atmosphere of the South Kensington Museum," and out of "regard" for that

alluring establishment, where more than half the expenditure goes to defray salaries, this ill-requited purchaser still consents to remain.

Mr. Cole affirms that "the decision to purchase" an object "is never made except with the perfect conviction" that it could "be sold for more money than it is offered for!" As if the rapacity of the dealer, or the market price, which constantly fluctuates with every caprice of fashion, not the excellence and intrinsic worth of the object itself, were the real test of fitness or eligibility.

When pressed upon the question of agency or brokerage, Mr. Cole says that it would be "impossible" for the gentleman holding a similar office at the British Museum to perform the duties of "purchaser" for both institutions, and begs the committee "to conceive the case" of simultaneous sales at different auction rooms, and then asks whether "the same individual" could possibly represent both establishments? thus presenting the dilemma of one person being in two places at the same time. Yet a few lines further on Mr. Cole admits that the official "purchaser" himself very seldom buys; "we," that is the British and Kensington Museums, employing "the same buyer!" who, by the way, is also a large dealer, and ought, on that ground alone, to be disqualfied for the office.

If the department be happy in its self-sacrificing purchaser, it is still more fortunate in the dealers with whom it is destined to traffic; for, while the purchases on behalf of the museum are made on the ordinary selfish and mercantile grounds—by "haggling in the market"—this doubly-fortunate institution has succeeded in creating a novel and disinterested race of dealers in *vertu* who sell their wares, not like other vulgar traders, for profit, but at a tremendous sacrifice, actuated solely by a "regard" for the interests of the Kensington Museum.

I might enlarge upon a variety of edifying disclosures to be found in the blue-book; such, for instance, as the overbearing and encroaching character displayed by this board—for it is a "board"—in its dealings with the Architectural Society, abruptly refusing, in answer to their earnest request, to take any "temporary measures" by which to avoid disturbing the valuable collection of that society. In reply to their application, the architects received an unceremonious "notice to quit," or to make over the collection and the management, on loan, to the Museum, forcibly reminding one of the ingenious *escopetero*, in "Gil Blas"—half bully, half beggar.

These are the grounds upon which I rest my opposition to the South Kensington scheme; and if the statement which I have here submitted for consideration be really characteristic of the principles on which the Department of Science and Art is conducted, then I shall be fully justified in protesting against the conclusions contained in the Report of the Vice-President of the Council and his Select Committee, and in appealing to the better judgment of the House of Commons, and to the good sense of the English people.

ON THE PHOTOGENIC ACTION OF COLOUR.

By Mr. S. Clarke.

[Read at the meeting of the South London Photographic Society, October 18th, 1860.]

The paper which it will be my pleasure to bring before you tonight is collected from facts which have been presented to my notice from time to time, and would, perhaps, if thoroughly investigated, throw at least some light on the probability, or otherwise, of the production of photographs in natural colours.

Every one using the camera must at times be struck with the surpassing beauty of the image on the ground glass, where every tint and varied hue is presented to the eye as a charming little picture, almost surpassing Nature herself. With what reluctance do we at times remove that glass, knowing, as we well do, that at most we can only secure the uncoloured shadow! What, think you, would be our joy if we could but secure those lovely tints!—with what pleasure would we plant our camera to greet the morning sun, and at evening to secure his parting rays! This much by way of introduction. * * *

At times, in developing with pyrogallic acid, parts of the picture will come out coloured, but invariably fade on drying. And during the past summer, in experimenting on the Fothergill process, I have occasionally met with a picture with the sky of a fine azure tone and the grass and foliage of a rich green, and, unlike the results in the wet process, these remained permanent after drying. These pictures were taken in dull weather, and the colouring seemed to arise from prolonged development.

Satisfactory indeed it would be to obtain a coloured picture direct in the camera; but if it be true that substances which reflect a certain colour will, by transmitted light, stop out that colour and allow the colour which is complementary to pass, then might we expect to obtain a negative from which we might print any number of pictures with the colours as they are in nature. In studying this I have been struck with the coincidence of this and the picture formed on the retina of the eye; for, on looking at a colour for some little time, and then removing it, the colour complementary to it will be seen. Thus, if a red wafer be placed on a piece of white paper, and you fix your eye on it for a few minutes or so, and then remove it, a green spot will be seen; a blue one would produce orange; and so on. Now, looking at the eye from a chemical point of view, is it not possible that it may be supplied with a substance capable of being impressed by these different colours? and if so, we might inquire into the nature of the impression and the substance in which it is produced. This I give for what it is worth, but, as I wish to abstain from any speculative ideas, I shall leave the subject and proceed to notice the more practical part of my paper, and shall ask your attention while I show the result of a series of experiments conducted by me during the early part of last month.

Experiment 1.—A disc of cardboard was divided into six concentric rings or bands, and coloured with the three primary colours (blue, red, and yellow), and their complementary colours (purple, green, and orange), and a photograph taken of it, which resulted in the blue coming out white; the red dark grey, and the purple light grey; while the remaining colours, yellow, green, and orange, made no impression on the sensitive film.

Experiment 2.—A transmitted positive was taken from a negative, on which three strips of coloured glass were fixed, the result being no action through the red and yellow glass; and it was evident, from the appearance of the picture, that the blue rather retarded than accelerated the action of light.

Experiment 3.—Two busts were placed in a box coloured grey inside, and so as to allow of no direct light falling on them (and arranged so as to produce as much shadow as the diffused nature of the light would admit), and a photograph taken of them, when the shadows were reproduced in a very correct manner, producing none of those black and white patches so often seen and so much disliked.

Experiment 4.—The foregoing, repeated with a blue light, reflected into the shadows, and which resulted in the entire destruction of all harmony and half-tone, producing little besides a white patch with the bare outline.

Experiment 5.—The foregoing repeated, reflecting into the shadows a red colour in place of the blue. This seemed to have the effect of softening them down; but as the action, if any, was so slight, it is almost impossible to determine the exact effect.

Experiment 6.—The foregoing repeated, reflecting a yellow colour into the shadows, which appeared to have no effect whatever either in diminishing or increasing the shadows.

Experiment 7.—A piece of blue glass was placed inside the camera, midway between the lens and the dark slide, extending to each side and to the height of the centre of the lens. A photograph was then taken, which on development showed unmistakeably that the blue glass stopped certain of the chemical rays. It may perhaps be worthy of a remark, that instead of there being any decided mark across the plate (as I had anticipated), it was nicely blended together. This I think might be turned to good account; for, if we were to put a piece of glass upright instead of lengthwise against the side of the camera, we might soften down the side which receives too much light, and so tend to harmonise the picture.

Experiment 8, and the last of this series, is merely a piece of sensitised albumenised paper exposed to the action of the three primary with their complementary colours. Here, however, we find a difference in the action of colour in different photogenic substances, and it would be well to compare the results:—

	Albumenised paper.	Collodion.
Greatest action in the blue		Blue.
Second „ „	yellow	Purple.
Third „ „	purple	Green.
Fourth „ „	green	Yellow.
Fifth „ „	orange	Orange.
Sixth „ „	red	Red.

Of course the above table is only applicable to transmitted light.

In glancing over these experiments there are one or two points which deserve attention. The first which I would bring to your notice is the peculiar action of the red ray; for, while it stands last in the scale by transmission, it is little inferior to purple by reflection. Some operators have observed, in photographing flowers, that it sometimes occurs that a bright red flower will have as great

actinic force as a blue one. This I think may be put down as a photographic "unaccountable," if I may use the term—at least I think it is a matter that deserves investigation.

From experiments 3, 4, and 5, it will be seen that by reflecting into the shadows different colours we may either reduce or soften them; but in my opinion this may be very properly dispensed with, as, if the subject be placed in a good diffused light, the contrast of light and shade will be lessened; and although the exposure be somewhat increased, the results will amply compensate for the prolonged exposure. The finest specimens of photographic portraiture I have seen have been taken in dull weather. Most of the gentlemen of this Society will remember a portrait (being exhibited at one of our meetings in the last session) of an exceedingly pretty Irish lady. This, it was stated, was taken in a place entirely surrounded by houses and smoky chimneys; and I do think if more attention were paid to the proper diffusion of light and shade we should soon observe a considerable improvement in our photographic productions.

PRINTING AND TONING OF ALBUMENISED PRINTS.

By J. Stuart.

[Read at the Meeting of the City of Glasgow and West of Scotland Photographic Society, October 4, 1860.]

The question is often asked by those who are about to supply themselves with photographic mementoes of the living: "Are they permanent?" I have no doubt as to the permanency if proper precautions be taken to free them from the chemicals used in the fixing. I am sorry that so many think a few hours' washing will do for the freeing of the print from the hyposulphite. It has always been my opinion that mere soaking is not sufficient if they are intended to be permanent. To my mind a certain amount of friction is requisite to force a union between the water and the soda left in a newly-fixed print. Tepid water is an excellent substitute for pressure, as the soda dissolves much more rapidly in it than in cold water. I should not consider that prints floated in cold water would be at all permanent. It is the duty of all who are engaged in supplying the public with paper prints to do all in their power to make them permanent; if not, it will quickly tell upon themselves. The public will soon find out that they are not getting lasting mementoes, but "dissolving views."

I cannot say much about the old mode of toning and fixing, as I had little experience in it—I mean that of adding the gold to the soda, as recommended by Mr. Hardwich in his *Photographic Chemistry*. Till the introduction of a new mode I thought most of the *sel d'or* toning bath. The principal difficulty was to prevent the prints from running yellow. In other respects it gave very fine results. There was a richness of colour about them, and the half tones were well preserved. In consequence of the great care requisite in the washing when taken from the printing-frame, and my not being able always to attend to that matter personally, I was obliged to give it up. I have some prints toned by that method five years since, and they are as good as ever. The paper at that time was not so good as it is now—at least I did not find it so.

I have brought with me to-night a number of other prints done by the method which I am about to describe. I have selected them with a view of showing you what a variety of tones can be produced by it. To look at them one would hardly think them done by the same process. By no means do I lay them before you as specimens of our art, but merely for reference during the discussion which is to follow the reading of this paper.

For the printing, good paper is essential.—There is much bad paper in the market: it remains with you therefore to try and get the best. There is some good yet to be found. The plan I adopt is to try a number of samples till I get what I consider good, then secure as much as will keep me for some time. Having got good paper, the next thing is to get good prints, which is not such an easy matter as the procuring of good paper.

First, cut the paper to the size that will suit you best, so as not to force you to have an unnecessary quantity of silver solution on hand. For cutting the paper you should have a bone knife, kept clean, for the purpose. Handle the paper as little as you can. It provokes one very much to see a dirty fellow "paw" the paper all over; and then, if there should be any stains in a finished print, he is sure to blame the paper.

Secondly comes your silver bath.—Make it up to the strength of ninety grains to the ounce of water, adding one drop glacial acetic acid to every ounce of the solution. At first thought some may think this a great waste of silver; but that is not the case, which may be proved by the following experiment:—Take ten ounces of a ninety-grain silver solution; pour it into a tray; then take the gross weight. Having previously cut twenty-four sheets of albumenised paper 8¼ by 6½, take twelve of them, and float them just one minute each on the silver solution; preserve all the droppings, and add them to the tray. Now take the weight again, noting how much it has lost; then test for its strength: in this way you will find how much nitrate of silver you have lost. Next proceed in the same way, only take a sixty-grain solution, and float three minutes, which is the time generally allowed. I found, then, that it had cost me 10 per cent. more for nitrate of silver in the sixty-grain solution, and the prints were not so good. The first showed the image upon the surface of the paper, while the other looked as if seen through a veil. It is not enough that you should make the bath of the above strength, but that you should keep it up to it; testing it when you have ceased using it. Bear in mind, also, that albumen tends to neutralise the acid first added: but keep it always acid. By testing it with litmus paper you will soon discover, by the colour of the paper, when it has enough.

Pour now your silver solution into a flat dish, to about the depth of ⅜ths of an inch. There is a danger in working with too little in the tray, as it is apt to cause bronze lines across the print: a halt when laying the paper has something of a similar effect. When you have the silver solution in the tray you will find a dusty sort of scum all over it, which no amount of filtering will remove. The only way of getting rid of it is to take a slip of paper and pull it over the surface, having its ends pressed close to the sides of the tray: letting down the paper without thus cleaning the surface of the bath would cause the paper to have a marbled appearance on its surface.

All being now ready to lay the paper, take it in your hand by the end; let the other rest on the silver solution. Now lower it down as you would a plate on a flat (or horizontal) bath, having the light between you and the silver, so that you may see air bubbles. Let it lie only one minute; then raise it up at the end first down, so as to give it all the same time on the silver solution. Dry it in the dark room quickly by means of a stove, or as may suit you best. When dry, lay it in a drawer, so that it may absorb moisture again, and thus be brought to a uniform state. You will find it to lie better to the negative, and to give better tones in this damp state. It will be found a great advantage, if there is a lithographic press at hand, to give the sheets two or three pulls through: it will make the print much sharper, by giving the paper a finer surface. As to the keeping qualities of the paper just prepared, there is no fear of it for some time—I should say for about a week—if you keep it from the light and in a dry place. I have brought a canister with me to-night; there is paper in it prepared two months back. If some one would take and print upon a piece of it, it would satisfy them as to what can be done in that way. I would not advise you to prepare it purposely; but if it so happened that you could not get your prepared paper printed, it might suit your purpose well. It would be a great advantage to the photographer—and more so in the winter months—if he could keep the paper till the light would suit. I have never been successful in the keeping of paper that has been floated upon the silver for three minutes.

Having followed these instructions, and thus got your sensitised paper, you must look to your negative. If it is thin you had better turn it into the shade, as it will not print so well in sunshine, which has too powerful an effect upon the intense parts of your negative, causing the face to look flat and grey; but if, on the other hand, the negative is strong or dense, the best effect will be got in sunshine. In fact, to print with taste, you should have two kinds of paper prepared—one as rich in silver as possible, and another a slightly salted and silvered kind—using the strongly silvered kind for the thin negative, and *vice versâ*. I had almost said it was a shame, but it is a pity, that those who albumenise paper do not mark how much chloride it contains: till they do so, or we prepare it ourselves (which by the way is no great trouble), we must be in a state of uncertainty as to what we are doing.

There is some attention required to see that all the parts are printing equally. You will find in some negatives parts which come out too rapidly: others—as in the case of groups, some being in the foreground—get overdone, so as to make the impression on the paper destitute of light or shade. There should always exist a certain amount of difference between those in the foreground and those in the back, but not to the extent that at times is produced in the negative; of course, without that the picture will be flat and worthless. There is, as the Yankee would say who has been writing to one of the Journals

lately, a "little dodge which you may here practise." Take a large magnifying glass and hold it up to the sun, letting the focus (not the burning point) full on the face or faces, as the case may be. You can make the light large or small as you find it answer your purpose. The lens I use is about 10 inches diameter; and I have found it of great service to me when there was any thing white in the picture—such as a white dress, book, or letter—the details being visible when looking through the negative, but which would not print till all the rest of the picture was over-done. I don't lay down the use of the lens in this way as anything new: one cannot mention a thing that some one has not known before. I fear some of you may think I speak long about trifles. Your print is now ready for taking out of the printing-frame. In appearance it should be what you would say "just too dark." Some paper gives way much in the after toning and fixing; others little or nothing: practice can be your only guide. If you can be ready for toning in an hour or two, lay the print down on water (face downward) for about five minutes. This water should be kept till you have floated a number of prints on it; then throw it into a large jar kept for waste silver solutions. In the jar you may have some pieces of copper, which will reduce the nitrate to the metallic state. When you have a stock of it you may wash it and dissolve it in nitric acid; it will be quite good for the paper silver bath. Upon no account should the prints be *immersed* in the first washing water, as it would cause liability to stains, there being so much difficulty in removing the free nitrate out of the paper, and it throws down a quantity of the gold in the toning solution. After floating the proof on the first water, lift it up and plunge it into water kept constantly changing: a self-acting tray you will find a great advantage. Having turned them about three or four times in the hour or two they lie in the water, they are ready for toning.

Arrange now all your trays, side by side:—first your toning tray set inside another, so that you may pour warm water about the toning tray at pleasure; secondly, a tray with clean water; thirdly, the tray with the fixing solution. Toning solution:—chloride of gold in solution (one grain to the drachm of water) one drachm; water about two ounces; then drop in a piece of litmus paper, which at first will be reddened; then take a saturated solution of carbonate of soda, and add till the litmus is brought back to its blue colour—any more has a tendency to soften the prints. Throw it then into your toning tray. This is by far the best toning bath, as it it combines simplicity with certainty. The fixing bath is as follows:—hypo. of soda 6 oz.; water 20 oz. Pour in as much as will cover the prints you have to tone—more is not required. Do not use the fixing bath twice, as there is no certainty of getting well-fixed prints after it has been once used. I have often found them turn yellow: if not at the time after a day or two. It is so pleasant to see pure whites, one should not grumble to spend a few pence in securing them.

In toning the print lift it out of the water, and pop it into the toning-tray: keep it in constant motion with your left hand. When it is rather darker than you would like it to remain, lift it out with the left hand; give it a rinse through the water with the right hand, then through the fixing-bath, letting it lie for fifteen minutes, with occasional turning, so as to insure its being well fixed. If air bubbles get between the print and soda they will cause spots from imperfect fixing. Some may wonder how I say, take the left hand for toning and the right for fixing. Were you to knock the hand into the gold solution that had been in the hyposulphite of soda it would deposit all your gold. I believe that through this very small matter the manufacturer is blamed when the bath will not tone more than two or three prints when it should have toned six at least.

I now go on with the toning of the other prints, working with the solution first made, till it becomes rather slow; when by pouring hot water about it, it starts off again; and so on till the last of the gold is wrought up. The prints having been left in the hyposulphite of soda for fifteen minutes, put them into water kept constantly changed (as before stated in a self-acting tray). Having allowed them to have two or three changes of cold water, then turn on the hot—say about blood heat: keep them constantly moving about for twenty minutes or so. You may now turn off the hot and let in the cold water for an hour or two; then allow them to soak all night, when you may turn on the water for an hour or two again. Some recommend that the prints should be dried off between folds of blotting-paper: that I think unnecessary. Hang them then over a line to dry; when dry they are ready for mounting.

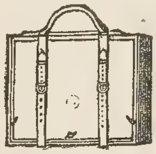
Though the mounting of the prints does not exactly come under this head, yet I may be allowed to say a few words on so important a subject. After the prints are dry the first thing is to cover them over with patent starch paste: they are then dried, trimmed on the edges, and are ready for mounting on cardboard. Having a lithographic press all ready, take a wet sponge and cover all over the cardboard. Lay the print you are to mount on the cardboard in its right place, holding the two together till you lay them face downwards on the stone: now put down the tympan, and one pull through will make them adhere, so that no amount of labour can take them off. In this way I can mount and press about 100 ($8\frac{1}{2}$ by $6\frac{1}{2}$) prints in one hour. There is another advantage in this mode—the boards do not turn up so much.

MEAGHER'S IMPROVED PORTABLE CAMERA.

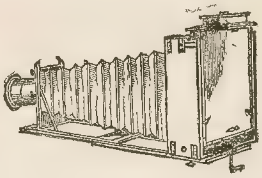
[Read by Mr. Simpson at the Meeting of the South London Photographic Society, October 18, 1860.]

This camera was, so far as the general design is concerned, I believe, invented originally by Mr. Kinnear; but the design in the one I am about to describe has undergone many modifications and improvements in detail. The chief claim I possess to bring it before the attention of this meeting is the fact that some of the improvements were suggested by myself to the maker. In stating this I do not claim any originality in the idea of these improvements, but merely their application in the present instance.

The points on which this camera claims the attention of photographers are portability, lightness, and efficiency, each of which I think it possesses in a maximum degree. The outside measurement of a camera for ten by eight plates is twelve and a-half inches by ten and a-half inches, and three inches deep: its weight does not exceed seven pounds, and, being supplied with a handle, it is portable in the highest degree. Its form when packed up is here shown:—



On opening the camera it is found to consist of a frame of Spanish mahogany or teak, three inches deep, having two grooves—the inner one to receive the focussing screen when packed, and the other to receive the dark slide or back. To the front is attached an extending body of leather, made with gussets like an accordeon or concertina, but having the form of an elongated truncated pyramid, which packs within the frame just mentioned. The base-board of the camera is made to form the front of the box when packed up. Within the base-board is a light but firm sliding-frame, by the extension of which the bellows are drawn out to their full extent. This extension is effected by means of a fine slow screw, which is worked at the back, thus affording facilities for the finest adjustment of focus from the back of the camera. Attached to the front of the sliding frame, to which I have just referred, is another hinged frame, which on being raised is found to possess grooves into which the part carrying the lens attached to the bellows is fitted, and being fixed by means of screws at any height possesses all the advantages of a sliding front. This small hinged frame is supported in position by oblique brass stays which are attached to the base-board, and, working on a centre, are laid flat when the camera is packed up. The frame constituting the body of the camera is attached to the base-board, either in a horizontal or vertical position, as the view to be taken may require, by means of two brass screws underneath. The form of the camera when erected for use is seen thus:—



I am now come to describe two or three important adjustments which the camera possesses, and which give it all the advantages of a double action swing back, both as regards lateral and vertical motion, without either the cumbersomeness or costliness usually pertaining to that adjunct. In the base-board, at the point at which the two brass screws attach it to the body of the camera,

are two curved slots, through either of which the screws attached to the body—which works on a brass pin in the centre—move for a given space, thus allowing the back, although fixed in the centre, to traverse the arc of a circle, and thus also gaining all the advantages of the swing back in that direction. The vertical movement is gained by a slight deflection of the lens, the frame which supports it working on its hinges, and is fixed in any required position by a screw which passes through a slot in the brass stays. I am aware that the use of this movement requires great care and some knowledge and experience, as, by moving the lever at the short end, a very slight inclination will cause a considerable deviation of the axis of the lens from its normal or true position. In the ordinary swing back the method of adjustment to give definition to objects in an advanced plane of the lower part of the foreground in a landscape, or of the figure in portraiture, it is customary to incline the top of the slide a little backwards, so as to adjust the distance between the objects in the foreground and that part of the plate on which they are delineated. Here it will be necessary that the camera itself shall be turned on its axis, or, in other words, that it be tilted, so as to give the back the requisite slope or inclination. In doing this, however, if the lens were rigidly fixed, it would no longer embrace the view to which it was originally pointed, probably little more than the tops of the trees and the sky being delineated. To remedy this, the facility of changing the position of the lens becomes of the utmost service; for, when the camera is thus tilted, a slight depression of the lens at once makes it include the desired view, and at the same time secures the direction of the axial pencils on the centre of the plane of delineation, whether it be the focussing screen or sensitive plate. Another point secured by this movement, which, to the artistic photographer, will be an important one, is the facility of slightly altering the direction of the axial pencils, and thus securing the best definition of an important part of the subject, irrespective of its occupying a central position, at the expense of some other part in which definition is of little importance. Thus, in a landscape, the foreground objects may often require, in order to produce the most artistic result, the best possible definition, which will be secured by directing the axis of the lens towards that part of the field, whilst the part which would suffer from this deviation of the axis of the lens would be the sky, in which definition is of little importance. I may mention here that Mr. Shadbolt, some time ago, devised a very ingenious method of effecting the very purpose secured in this camera by these simple movements. His plan was to attach the lens to a piece of wood constituting a section of a globe, which, being secured in the aperture, in front of the camera, possessed a ball and socket movement, allowing the lens to be turned in any direction. The especial object of this invention was an easy application, to ordinary rigid cameras, of this movement, which is here obtained, however, by a much simpler method. As I before remarked, it will be necessary, in making use of this adjustment, to use caution, remembering that, in proportion to the length of the lever, formed by the body of the camera, a slight movement of the lens will cause a very considerable deviation in the direction of its axis towards the plate.

It only remains to be added that single backs for wet plates, or double backs for dry plates, can be fitted to this camera without increasing its bulk; and further, to add that the material, mechanism, finish, and general workmanship, appear to be of first-class character throughout, thus securing the efficiency to which I first referred, as well as the portability and lightness which are so apparent as to need no further comment.

ON DRY COLLODION.

By M. A. Gaudin,

Calculator at the Bureau des Longitudes.

At the present moment the stereoscope has become the most important branch of photography. Notwithstanding the small dimensions of the proofs, I am fully convinced that in the execution of stereoscopic proofs, negatives as well as positives, the greatest quantity of chemical substances are consumed, and that they have given rise to a most important commerce.

If we do not employ albumenised plates for obtaining negatives, we operate upon collodion. But what a number of difficulties present themselves; for we require a laboratory at hand in order to sensitise the plates and to develop the images, without even taking into consideration that the degree of dryness of the air has a considerable influence upon the results.

It is therefore of the highest importance, for the prosperity of the stereoscope, to be able to operate upon dry collodion as we operate with albumen; and M. Vernier's letters have appeared just at the right time for the discussion of the question. Unfortunately, he promises to tell us why our experiments have been unsuccessful; but in this I only see a very ingenious mode of criticising what has been done or proposed, without ever sifting the question to the bottom, if we except his inquiring into the glutinous nature of the collodion, and his opinion that we ought to be able to modify it by certain additions, which he cannot indicate, having generally only very vague ideas on the whole question.

I will therefore again reiterate the facts. In what does albumen differ from the collodion? It differs from it in an essential point: it is soluble in water, whilst the collodion does not dissolve in it. It is true we render the albumen insoluble during the manipulations; but previously it was soluble, so that in iodising it the salt becomes thoroughly mixed with the albumen, and on passing to the silver *bath* the iodide of silver is produced through the entire substance of the film. At this moment the albumen is rendered insoluble. But the layer of albumen has already been transformed into an extremely delicate and spongy body, capable of absorbing in swelling all the aqueous compounds. It will suffice to look at the white of an egg which has become coagulated, either by heat or acids, to be convinced, from its opaline colour, that it is a very spongy body.

The collodion, on the contrary, is a fatty body—that is to say, soluble in a mixture of ether and alcohol, *which is precipitated by water*, and which has no affinity for it, but which unites with fatty bodies, and strongly adheres to them. This is the reason why, on collodion being poured on the plate, a division takes place when its solvent is evaporating: the collodion separates, and the iodide which has been added spreads above in the form of a film; and when this comes in contact with the silver bath, a continuous pellicle of iodide of silver is formed *on the surface of the collodion*, and not *in its interior*.

This we easily see when we make use of too weak a silver bath, or when we try to use a fresh bath of 2 or 3 per cent. only. The iodide of silver gets detached, and on the plate there remains a layer of limpid collodion.

Thus it is proved that coagulated albumen is permeated by watery liquids, whilst the collodion is impermeable to the same.

I will, however, give another convincing proof of it. For a long time I have had the idea of making use of a thoroughly sensitive collodion—that is to say, a collodion which contains iodide of silver. I at first found it very difficult to produce iodide of silver in the collodion without the latter becoming coagulated; nevertheless, I at last succeeded in the experiment, so that, having poured my collodion on the plate, I had, to all appearance, a layer of sensitised collodion, for it possessed its bluish tint to perfection. I thought I had nothing more to do but to expose, and then to develop with a solution containing nitrate of silver, for the impressing of the iodide by the light to be made apparent; and it certainly did take place throughout its substance, but the argental developer never produced aught but the slightest effect, however long the action of the light had been. The collodion is therefore, even when quite fresh, *impermeable to watery liquids:* its iodide is usually quite superficial, whilst the albumen, whether fresh or old, is *permeable to watery liquids*, and the iodide of silver is quite as much in its substance as on its surface.

Every preparation containing free nitrate of silver is subject to reactions, which will take place in time, even when protected from the light. We cannot preserve them for a long time without their getting weak. In order to preserve dry collodion as we preserve albumen, it must be subjected to washing, in the same manner as the albumen; and if we would only be, in this respect, as careful with the collodion as with the albumen, we should obtain the same good results, with this difference, that the sensitive layer, being wholly superficial and protected by nothing, is much more exposed to the influence of time.

If the collodion be well washed, it will, in my opinion, be preserved even better than albumen: for, at the moment of exciting, the nitrate of silver is introduced into the innermost part of the albumen; whilst, with regard to the collodion, it wets only the two sides of the film. I say the two sides, because it is quite evident that, during the immersion, the nitrate of silver comes instantaneously in contact with the surface of the glass itself. This can easily be observed whenever a badly-prepared glass contains organic matter at some place or other of its surface; for we always find there a production of silver reduced during the process of sensitising.

According to this we must, therefore, not only remove the surplus nitrate of silver on the surface, but also that which is towards

the side of the glass. In the albumen, the latter is by far less, because during its passage it comes everywhere in contact with iodide, by which it is decomposed.

In conclusion, I say, and repeat again, wash the collodion with the greatest care; immerse it in salt-water; and, lastly, wash it again with the distilled water, and you may confidently operate upon it in the same manner as you do upon the albumen.

STEREOGRAPHS.

Canterbury, Rochester, and the Watering Places on the South and South-east Coasts, by W. Russell Sedgefield.

(A. W. Bennett, Bishopsgate Street, London.)

The stereoscope is an instrument that, like the horseleech, continually cries, "Give! give!" and, according to the status of its proprietor, so must its food be. The geologist, mineralogist, botanist, conchologist, artist, &c., have each a class of slides which they most affect; nay, let a man's hobby be in almost any direction, it would be difficult to point out one in which food for his own particular stereoscope could not be found. It is a commercial axiom that "where there is a demand a supply is sure to follow;" but it is equally true that a supply not unfrequently creates a demand, which would perhaps scarcely have existed but for the pre-existence of the means of satisfying it.

It is of course easily enough seen that, in producing stereographs for those who have a pursuit, it is only necessary to depict subjects in which they take an interest, and the sale of them is already half accomplished; but what is to be done in order to catch the fancy of those who have *not* any special hobby—the οι πολλοι, the great mass of purchasers in expectation? Truly to do as Mr. Sedgefield has very recently been doing, in reproducing those haunts "where men and women most do congregate;" and the best of all possible times to bring them out is just the present time, when most of those who have been fortunate enough to get a short sea-side holiday have returned home, bringing with them a vivid remembrance of the scenes they have so lately visited. "Strike while the iron is hot" is an old proverb. Let the slides now before us come across the late sojourners in any of the localities depicted, while the scenes are fresh in the memory, and they are nearly sure to become possessors of them; and, having visited one place—Hastings for instance, and not Dover—a few of the latter must accompany the more familiar scenes just by way of contrast and for comparison.

In preparing a series to meet the requirements above indicated, there is scarcely that amount of room for artistic selection that would be satisfactory to such an operator as Mr. Sedgefield. It is not always the most health-restoring spots that abound in the picturesque; and the photographer must perforce take the places just as he finds them, or leave them alone altogether. There is no putting in a tree here, or leaving out a dead wall there, to improve the subjects; but they must be had in all their native beauty or ugliness, just as it may happen. It would, therefore, be unfair to criticise the series before us by the ordinary standards of artistic merit. But this quality has not been overlooked by the operator, for where the subject has admitted any choice the most has been made of it; and in all an endeavour is apparent to introduce as much of ART as NATURE would permit.

From Canterbury we have the Cathedral from the east, and also a well-executed illustration of Dean Lyall's Monument; but that which exhibits the best effect is No. 622, being a view of The Cloisters of St. Augustine's College, in which the *chiaroscura* is highly pleasing, although the subject is extremely simple. The patches of sunlight falling through the mullioned embrasures of the corridor upon the chequered floor, contrast admirably with the softened shadows, which, though deep, are beautifully transparent.

From Rochester we have the Cathedral, and from Rye the Shipyards. Each is full of incident, both in the distance and foreground.

A portion of the quay of Ramsgate Harbour, with some vessels alongside, may be taken as a sample of that resort; and a singular chasm in the cliff, through which the pier is seen in the distance, serves as a record of a Margate scene. It is evident from this last that Mr. Sedgefield employs a single lens camera; for three vessels out at sea, visible in both pictures of the pair, have slightly shifted their positions between the times of the two exposures—which is a pity, for they would greatly have added to the value of the effect had this not been the case.

Hastings is taken from the beach, on which a small brig and a dense crowd of fishing smacks are drawn up above high-water mark. The east cliff, with the pathway leading towards Fairlight Glen, are seen in the distance, and a gentleman is standing close to the water's edge.

Of Dover we have the Harbour, the Heights, and Barracks, Shakespeare's Cliff, with a portion of the railway along the sea shore; and on one of the cliffs near at hand a figure is very effectively posed, pointing out to sea.

The best of this locality is, however, that entitled the Bathing Machines, whether as regards execution, illustration, or composition. A crescent of houses, of the orthodox sea-side style, with the pleasant verandahs, form the back-ground; one *machine*, with its ugly canvas hood, is in the water, and another just drawn up on the ridge of shingles (*mem.* canvas hood considerably patched), while the rest are high and dry, almost on the shore. Midway is a "groyne," which as usual seems to have special attractions for the loiterers on the beach (we always notice three times as many people there as anywhere else); for here are ladies, gentlemen, and children, in various attitudes, intently observing the solitary machine or the towels spread out to dry. Close to the spectators is a group of little girls sitting on the beach with their wooden spades, while the transparent spray from the waves on the shore is beautifully given; and the wet portion of the shingle exposed to its influence contrasts well with the dry crispness of heaped-up water-worn pebbles under the blazing sunshine.

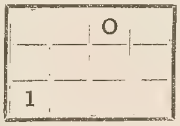
We have only to remark, in conclusion, that the whole are executed with Mr. Russell Sedgefield's usual skill.

Letters to a Photographic Friend.

No. VIII.

Dear Frank,

I have now to tell you of what came under my notice at the photographic apparatus *makers'* who have establishments out of the main thoroughfares of "this wonderful metropolis;" and the first that fell in my way was Routledge's, whose workshops, I may tell you, are situated at 14, John's Mews, Bedford Row, as he has moved from Devonshire Street, where in the first instance I bent my steps. Here I found he had in hand a general camera of large size, suited for the operating-room, with an arrangement for taking *twelve* "card portraits" on a single plate by means of one lens. This was effected by bringing twelve parts of the plate successively in front of the lens by a right-angled movement in two directions—

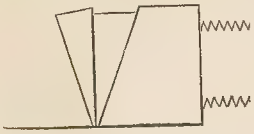


downward and sidewise—which you will comprehend by this tit-tat-to sort of diagram, the "first go" being at corner number 1. Four compartments are brought successively in front of the lens, and the frame is then pushed downwards in a groove. The row of four is then pushed before the lens in an opposite direction, and the plate frame then again pushed downwards. As Routledge lays himself out for "the trade," there was not much variety in stock for inspection, but what there was was of the right sort.

I then went off to Ottewill's, at Charlotte Terrace, Islington, one of our first camera-makers in more senses than one. Here a twin-lens camera was brought under my notice, with an arrangement for separating the lenses from 3 inches from centre to centre to a range of 4½ inches; but, to prevent light obtaining access to the plate, the separatable lens-carriers are attached to roller blinds, like the iron ones used for shop shutters—so that as the lenses are separated by means of double racks and a pinion, the apertures that would otherwise exist in the camera are covered over by the extension of the shutters simultaneously with the advance of "*the lens-carriers.*" This piece of apparatus is exquisitely made—in fact so neatly that it puzzles one like a conjuror's trick to know where the shutters go to, and is worthy of Robert Houdin. If George the Third was troubled to guess how the apple got into the dumpling, I guess he *never would have been* clear in his mind (if he ever had any; for, if one is to believe Thackeray, he was "out of that article") as to where the shutters went to, if he had had the opportunity of seeing this ingenious contrivance.

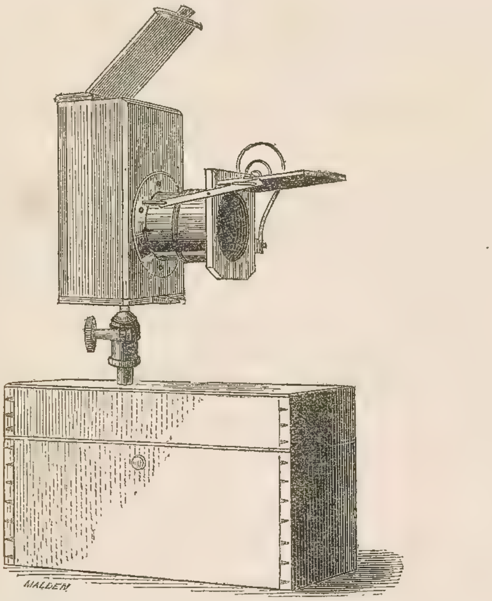
Another form of twin-lens camera consisted of a pair of bellows bodies placed behind each lens, so as to allow of a minimum or maximum range for lenses of long and short focus; such, for instance, as Dallmeyer has introduced in his new stereoscopic form. In this apparatus the fronts of the bellows are not fixed to the front of the camera; but they have a lateral motion

in grooves, so as to be able freely to follow the action of the separatable "lens-carriers." The wedge-shaped back of this camera has a swing motion in one direction, which renders this form of instrument very suitable for working with a pair of Ross's orthographic lenses, which, as I told you on a former occasion, are admirably adapted for taking stereographic portraits. The annexed diagram will give you an idea how the motion is effected.

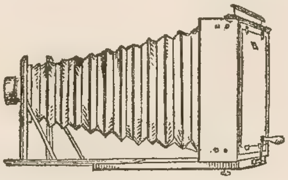


This camera has a range from $2\frac{1}{2}$-inches to $7\frac{1}{2}$-inches.

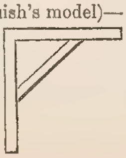
You will recollect that in a previous letter I called your attention to the small portraits produced by Skaife's Pistolgraph. Mr. Ottewill showed me a miniature camera that packed into a box $5\frac{1}{2}$ by $3\frac{1}{2}$ and $3\frac{1}{2}$-inches deep, with an instantaneous motion attached to the lens that some on theoretical notions will prefer to Mr. Skaife's shutters; but in either case, "the proof of the pudding is in the eating." Instead of being made in metal, it is made in mahogany, and a very pretty little thing it is. By aid of the following drawing you will understand the general arrangement of this



instrument. The shutter, you will see, is forced down over the aperture of the lens by means of a coiled spring, and is raised for the exposure by the leverage of an arm impinging on a pin projecing from the side of the shutter. As soon as the arm has been rotated past this pin, the spring forces the shutter down over the lens. As in Skaife's shutters, the exposure may be instantaneous or prolonged *at will*. Mr. Ottewill had likewise a very rigid



camera which, in principle, was like those I told you I saw at Melhuish's, Rouch's, and Shepherd's, but the conical body in this case was made bellows fashion, instead of in plush (as in Rouch's instrument), or waterproof (as in Shepherd's), and the frame-work and slides in wood, instead of in metal (as in Melhuish's model)—the telescopic base-board adjustable by an endless screw, being the same in each instance. By turning to my second and fifth letters you will see that I have described the mechanism of this form of camera. The rests for the glass in the plate-frame were in Ottewill's instrument castings in silver, in what might be called "gallows pattern." Thus:—

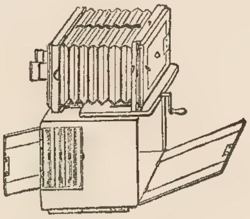


The camera examined was $12\frac{3}{4}$ by $10\frac{1}{2}$, and 3 inches deep, when packed, and had a range of 19 inches for focussing.

Curiously enough, on going to Hare's, at 140, Pentonville-road, I saw a camera constructed on the very same principle; but the board that carried the lens was hinged so as to have bearing when the struts were clamped, to give a still greater amount of rigidity to the bellows front. The camera I inspected was $10\frac{1}{2}$ by $8\frac{1}{2}$, and $3\frac{1}{2}$ inches deep, when shut up for travelling, with a focussing range of $15\frac{1}{2}$ inches. In both these instruments the range of focus obtained by means of the telescopic base-board was very considerable.

Thus, you will see that this form of camera is claimed by Ramsden, Rouch, Kinnear, and others, and, curiously, I myself can put in a claim for inventing this principle of construction as early as the commencement of the Russian war, when I designed a camera specially for war purposes to be used in the Crimea, portability being an essential element. The camera and "traps" were, in my case, carried on an axle to which a pair of large *folding* wheels were attached. The drawings were examined at the Society of Arts' rooms by Mr. P. Le Neve Foster, Mr. Fenton, and an officer of engineers, afterwards lost in his ship during the memorable storm off the Crimean coast. Instead of a telescopic base-board, I employed a coarse wormed endless screw, working in a tube, embedded in a piece of oak: the piece that carried the flange-plate of the lens worked to and fro on the screw, on the handle being turned. Being in one piece, this secured perfect rigidity in the base-board, which does not obtain in all forms of this model. Thus I am informed that an instrument on this principle was exhibited at the South London Society, the other night, which was *very* shaky in the base-board owing to that part being too lightly framed,* and from the lens-board being hinged to it on faulty principles. At that time I employed fine black cloth for the conical body, supported by five vulcanised india-rubber tubes; but the bellows cone is a great improvement on my primitive plan. In other respects my camera was the counterpart of these *novelties*.

I likewise examined, when at Mr. Hare's, a very compact twin-lens camera, and a peculiar arrangement for a swing-back which takes very little space; but you will find a description of both of these at page 188 in the present volume of THE BRITISH JOURNAL OF PHOTOGRAPHY. I, however, give you a sketch of the twin-lens camera.



I must not forget to draw your attention to Moginie's tent, which takes the fancy of many; but, as this is fully described and figured at page 177 of THE BRITISH JOURNAL OF PHOTOGRAPHY, I need not re-describe it to you. It may be obtained from the inventor, at 14, Albert Street, Camden Road, if you should think it suitable to your purposes.

I must now, my dear Frank, bring this letter to a close; and in my next will give you the results of my last look round London before I betake myself to my country fire-side.

So believe me,

Yours, faithfully,

SIMEON HEADSMAN.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE first monthly meeting of this Society was held on Thursday evening, the 18th ult., at St. Peter's School Rooms, Walworth,—the Rev. F. F. Statham, President, in the chair.

The PRESIDENT, in opening the proceedings, observed upon the unpleasant summer they had experienced, which, in his opinion, must have been most unfavourable for photographic pursuits. If he might judge, however, by the large attendance that evening, the ardour of the Society's members was not to be damped by any amount of wet; and he

* See "Meagher's Improved Portable Camera," page 315 of the present number.

trusted that the gentlemen present had come prepared to produce specimens of their labours. Some advantages might have been derived from the moist state of the atmosphere, as effects might have been obtained which dry weather would not have shown. One gentleman, for instance, had just been showing him a very wonderful change in the appearance of a plate, which could not be accounted for, but which might have been caused by the continued wet. It had been announced at the last monthly meeting that the members of the Society would continue to meet during the summer months out of doors, but those meetings had been much interfered with by the weather. Three of those meetings, however, had been held, and he had witnessed the painstaking efforts of some of the members to obtain views under the very adverse circumstances in which they were placed. He would call upon Mr. Wall to read the report.

Mr. Wall, the Hon. Sec., then read the report, and the minutes of the last meeting.

The minutes and report having been adopted and confirmed,

The President announced a donation to the Society, by Mr. John Bailey, of Darlington, of a photograph of Professor Taylor and a group of figures, and by M. Joubert, through Mr. Simpson, of two other specimens. He also wished to say that the present meeting had been held in St. Peter's School-rooms to avoid the unnecessary expense the Society had been put to at their last meeting for the hire of a room.

Mr. Simpson wished to call the attention of the meeting to the specimens he produced of coloured photographs enamelled on glass, the invention of M. Joubert. They were printed in three colours, and fixed by burning.

The President asked if the invention was patented?

Mr. Simpson replied that it was. The process might be applied to all ceramic manufactures. It would lead to the ornamentation of many works of art which pass through the fire.

Votes of thanks were passed to Mr. Bailey and M. Joubert, for their kindness in sending the photographs and specimens.

Mr. Hughes then proceeded to read a paper *On the Mechanical Adaptation of Portrait Lenses for View Purposes*, and produced and explained the various arrangements therein described. [Mr. Hughes's paper will appear in our next number.]

The President, at the conclusion of the paper, moved that a vote of thanks be tendered to Mr. Hughes for his very able paper, and the great trouble he had taken to render so difficult a subject clear to those present. It was very desirable that the mechanical arrangements of photographic apparatus should be brought as near perfection as possible, as upon them depended, in a great measure, the delicacy of manipulation so necessary to the production of a good photograph. They were trying mechanical excellence in instruments of warfare, and he did not see why it should not also be applied to the peaceful arts. It was a decided advantage both with respect to economy and convenience, especially when at a distance from home, to have an arrangement whereby the same lenses and brasswork could be used for both purposes. He should have liked to have had a summing up from Mr. Hughes upon the respective merits of the different adaptations he had explained to them. Some of the contrivances were of the most complex character, whilst others—especially that suggested by Mr. Hughes himself—were evidently simple and cheap, and were apparently the best in all respects. However, he thought Mr. Hughes had thrown out that the more complex arrangements had excellencies peculiarly their own.

Mr. Ackland said he had various objections to make with regard to the arrangements produced. In the first place Shepherd's arrangement was no novelty, whereas that plan had been mentioned long before in the second, third, fourth, fifth, sixth, seventh, eighth, and ninth editions of Horne and Thornthwaite's *Guide to Photography*. Whatever advantage was obtained in convenience by using the same diaphragm was counterbalanced by the fact that no workman could mount a lens or turn the threads of the screws so that the axis of the lens when used one way should coincide with its axis when reversed. That was the case with nearly all of the arrangements produced. There was no fault in the workmanship—the fault was in the principle; and he was quite certain that accuracy could not be obtained by that method. Then he had another objection to make: when the lens was reversed there was the whole of the projection in front to reflect light into the camera, which produced a halo. This could not be avoided by blackening the projection. There was another objection to the arrangement: photographers as a body were amateurs, and if an apparatus were given them that they could do anything wrong with, they were sure to avail themselves of the chance. Now, in most of the arrangements there was nothing to prevent the lenses being screwed in with the wrong face of the lens to the object. He had had a camera returned from India as defective, and he found the only fault was that the purchaser had put the lens in the wrong way. Messrs. Horne and Thornthwaite burnished the front of the lenses' fittings in such a way that it was impossible to make a mistake in that respect, and he had also made a contrivance by which the lenses could not be screwed into the wrong place.

Mr. Hughes said that such a mistake could not occur with the Ross's arrangement he held in his hand; for, although the front lens could be placed in the position of the back one, there was no thread left exposed for the hood to screw on, so that if the lenses were wrongly placed the arrangement was self-detective.

Mr. Ackland said that certainly was an answer to his last objection. With reference to the use of the bayonet joint in Derogy's lenses, he did not consider that it would make the axis of the lens when reversed so true as the screw joint. Every lens ought to be mounted in the cell whilst the other portion of the brasswork was in the lathe, so as to cut the thread of the screw and the cell at the same time. The slightest thing would throw the axis out.

Mr. Eidmans said he believed that the landscape and portrait lenses ought to be separate instruments.

Mr. Ackland said he made them either way, but they were better separate. He sold the separate arrangements for the same price as the other form.

Mr. Blanchard asked whether the objection, that the rim of the reversed lens reflected light into the camera, applied equally to Millet's arrangement, which appeared to him extremely simple and good.

Mr. Ackland said the construction of Millet's arrangement did away with all reflected light, and was one of the best on the table.

Mr. Eidmans thought it would be very satisfactory if photographic societies had a room for experiments where the makers could send their various arrangements to be tested by competent persons.

Mr. Wall said that was a most excellent suggestion; but their funds would not permit of it, although he thought richer societies might follow it beneficially. They were, however, establishing an experimental committee for the express purpose of testing both mechanical and chemical apparatus used in photography.

Mr. Hughes said they were much obliged to Mr. Ackland for his critical remarks. In reply to an observation of the President, that he should have summed up the respective merits of the different arrangements, he begged to state that he wished to tell them everything he knew upon the subject, but he did not wish to express any opinion either in favour of, or adverse to, any of the arrangements which had been lent to him for this occasion by the various makers. It would have been ungracious in him to have borrowed an apparatus merely for the purpose of condemning it; and, in fact, he should not like in any case to give a decided opinion upon the subject, for what one person approved another did not like. One individual required a *multum in parvo*—something that would go into a thimble; whilst another liked to be surrounded with different arrangements, as he was then. The fact was that each of these various adaptations had its use, and had been manufactured to satisfy some craving want on the part of the customer. One manufacturer improved his apparatus by making it more complex, whilst another improved his by making it more simple. How one man, therefore, was to judge and to decide for all the rest he did not know. All he could say was that great ingenuity was displayed in them all. Before he sat down he wished to call Mr. Ackland's attention to one point. In his (Mr. Hughes's) arrangement, the front lens reversed was simply screwed in the place of the back one, and the usual portrait diaphragms did duty for landscape purposes, but had this peculiarity, that they were moveable, and could be adjusted forward or backward to suit the photographer's emergencies, whereas all other single lenses had their diaphragms fixed in one plane. Could Mr. Ackland explain why they were always so fixed?

Mr. Ackland said they fixed them because it was better to select a safe position for them than to let their customers place them at a wrong distance.

A Member asked Mr. Ackland how they could tell when the axis of a lens was central?

Mr. Ackland said that was a trade secret—one of the important secrets only known to a few.

The President said he did not wish to press Mr. Hughes into expressing an unfavourable opinion regarding any of the lenses before him, and he was sure the members present must be much obliged to him for his paper, and also to Mr. Ackland for his remarks upon the subject.

A vote of thanks to Mr. Hughes was then unanimously carried.

Mr. Simpson then read a "jotting" *On Meagher's Improved Portable Camera*. [See page 315.]

The President said that the chief advantage gained by the improvement, in addition to the general portability and lightness of the camera, appeared to be a movement whereby the field could be altered and more perfect definition obtained. Thus it would give more flexibility of application, if he might use such a term, than more rigid instruments would permit of.

A vote of thanks to Mr. Simpson for his communication was then carried unanimously.

The President announced a further donation to the Society, by Mr. Davies, of two photographs.

Mr. Wall said he was very much pleased to announce that the committee proposed for experimental purposes had been formed, and that at their future meetings they might hope to receive communications of value relative to its labours in testing or carrying out such processes, modifications, or suggestions as might arise from the proceedings of other societies, or that might transpire in any of the photographic periodicals. Mr. Hannaford had kindly consented to serve as secretary to the committee, which would be formed of the following members:—Messrs. G. W. Simpson, Sebastian Davis, W. Ackland, — Blanchard, J. Martin, C. Jabez Hughes, T. Clarke, — Borchert, G. J. Tear, and J. C. Leake. He trusted that at their next meeting they would have a "jotting" from the committee.

The PRESIDENT called the attention of the members to a plate exhibited by Mr. Howard, which was a most remarkable instance of the reversed action of light. It was a transmitted positive obtained direct in the camera.

Mr. HOWARD stated that the plate was prepared for the Fothergill process in the usual way, and after four minutes' exposure he found that instead of a negative he had produced a positive. He could not account for it.

Mr. DAVIES suggested that there might have been something peculiar in the chemicals.

Mr. HOWARD said the materials were the same as he had been in the habit of using. He had taken upwards of 400 or 500 plates, and had never met with such an accident before.

Mr. CLARKE then read a paper *On the Photogenic Action of Colour.* [See page 313.]

The PRESIDENT said Mr. Clarke was pursuing a very difficult course in endeavouring to produce coloured photographs. He was proceeding with different coloured lights, but in his (the President's) opinion that was not the right line to pursue. What was wanted was a surface capable of reflecting colour. In the wet process a coloured photograph was frequently observable on the film whilst wet, which disappeared on its becoming dry. In order to keep the colour, the same surface must be preserved, and this had not hitherto been accomplished. M. Daguerre had produced the colours in very great perfection, but that result had not been obtained since. The question was how to form a surface capable of absorbing and reflecting colour, and until this could be done it was in vain to hope for coloured photographs.

Mr. WALL said the experiments were of some value with relation to the proper lighting of the image. The obtaining of colour seemed to hold out such faint promise of success, that he almost regretted to find clever men devoting themselves to such a path. He thought, however, that the study of the actinic action of colour might be profitably pursued. It was one which had been much neglected, and which might be profitably investigated.

A vote of thanks to Mr. Clarke for his paper was carried.

It was then decided that the further discussion upon the subject should be postponed until the next meeting.

Mr. Hazelhurst, Mr. P. Meagher, and Mr. G. Triptree, were elected members.

Mr. WALL then announced that at the next meeting a paper would be read by Mr. Alfred Hervé, *On the Positive Collodion Process*, and Mr. Hannaford would read a very interesting "jotting" from the experimental committee.

The proceedings terminated with a vote of thanks to the President for his services in the chair.

IN future the South London Photographic Society will meet at half-past seven precisely, the chair to be taken at eight—it being found that much time has hitherto been lost in the examination of specimens and apparatus, and in conversations thereupon, the regular business of the evening being thus considerably delayed.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on the 10th ult, at the Chorlton Town Hall,—Mr. William Griffiths, one of the Vice-Presidents, in the chair.

The HONORARY SECRETARY read the minutes of the last meeting, which were confirmed.

Three new members were then elected.

Mr. BARNBY called the attention of the meeting to the fading of two prints, purchased by him, and which were contributed about one year ago, by Mr. Draffin, to the Society. These were said by him (Mr. Draffin) to be permanent, although they had been only washed four or five minutes.

Mr. SHEARD said he had heard a gentleman describe the application of hot water for washing plates for the new process of Messrs. Petschler and Mann, when on a visit to a meeting of the Manchester Society. Not feeling satisfied with the use of a jug for that purpose, he had made a bath of copper, raised upon legs, so that, by the application of gas or a lamp, the water could be kept at the required temperature so long as it was needed. He begged to lay it before the meeting. He had tried a few plates by this process, but was sorry to say that they were not satisfactory; indeed, he might add, that he had not been perfectly successful with any of the dry processes. He brought with him a negative, veiled in fog, and wished to lay it before the meeting, and ask through the chairman if any member could inform him of the cause of his failure. He was convinced that one cause was the source of all his failures, as, whatever process he tried, he could not get a clear negative, but all were covered with fog like the one he then produced.

Mr HOOPER and several members stated their views of the cause of the fog being present, which was thought to be impure chemicals or imperfect manipulation.

Mr. SHEARD then proceeded to state that, with a view to prove the non-sensitiveness of a collodion plate coated with chlorided albumen, according to Messrs. Petschler and Mann's formula, he had undertaken a number of experiments, the results of which he would lay before the meeting. He had prepared a plate in strict accordance with their directions—that is to say, he had coated a plate with ordinary iodised collodion, sensitised it in a slightly acid bath, washed it thoroughly under a tap for five minutes, then, after slightly draining, had coated it with albumen and water, equal parts, containing chloride of sodium two grains to the ounce; he had then dried the plate by artificial heat, without exposing it to light. In this condition, the following day he exposed it fifteen minutes in a camera with a quarter-inch stop, six-inch focus landscape lens, and a medium light. After removal from the camera he poured over the plate the usual pyro. developer, mixed with nitrate of silver. Chloride of silver was produced, which was seen floating in white curdy particles in the developer, and after a time a faint impression was visible. He then washed the plate, but only fixed one-half of it in hypo. He had brought it with him for the inspection of the members. [The plate was then handed round. It was perceived that the portion which had been fixed appeared as a negative, whilst the unfixed part appeared as a transparent positive.] He had tried several others with like results. He thought that the alleged non-sensitiveness of these plates prior to the washing away of the chloride albumen was not proved.

A discussion on the chemistry of this process followed.

Mr. ARCHER handed round several negatives which he had taken by Mr. Whipple's albumen process. They had received a short exposure, viz., two minutes, with a six-inch landscape lens and three-eighths aperture; but he was occasionally subject to blistering of the film. With that exception, the process was simple and certain, and the manipulation easy.

Mr. ROGERSON showed a very large print, eighteen by twenty-two inches, representing a view in Wales, from a wax-paper negative, which was very much admired, the distance and half-tone being very well rendered. He also exhibited a stereoscopic camera, with four double slides, weighing altogether not more than two and a-half pounds, focussing-glass and all complete, exceedingly small and compact, which was considered to be well worthy the notice of all practising stereoscopic photography.

A vote of thanks to Mr. Sheard for his interesting experiments, and to Mr. Archer for his description of the albumen process, was passed. The meeting was then adjourned, after a vote of thanks to the chairman for presiding.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VIII. *(Continued.)*

MATERIALS, &c.

I WOULD advise you to purchase these in the sets sold by our respectable dealers. I give Newman's colours the preference myself, as the more reliable and pure. A box fitted complete with all the necessary materials may be procured for a small sum, and this I think the better plan. You will require the magilp; colours; sable, hog-hair, and badger brushes, both flat and round; palette, palette-knife, a glass slab and muller; a small lancet, oils, varnishes, a brush-washer, and dipper. You will also need a mahl-stick. A rack drawing-desk, or small table easel, is best for small pictures; but for large an ordinary easel will be required.

Palettes.—The best palette for *our* purpose is a white japanned one, because then the colours and tints appear on the palette as they do upon the white surface of the paper. If you use a wooden one, it should be soaked with as much raw linseed oil as it will absorb, before use. For smaller pictures the palette is best fastened temporarily to the desk; for larger it is balanced on the hand by placing the thumb through an aperture for the purpose. It should be thin, light, and balance well. Keep the palette cleaned regularly after use, and never suffer the pigments to harden upon its surface. Two or three China tiles, a few inches square, will be of use for tints which it is desirable to keep clean and pure; as in working other colours on the palette some mixture may inadvertently be effected of serious consequence to the beauty of your colouring.

A Glass Muller and Slab.—A slab of ground glass, fitted into a wooden frame, and a muller, are wanted, to regrind the colours before applying them to your palette—a practice which I recommend you to adopt, as more delicacy and smoothness will naturally be looked for in pictures so small as photographs usually are than would be expected in larger ones on canvas.

Mahl-stick or Hand-rest.—This is used to steady the hand or arm in putting in minute work—the surface being in a wet state, not permitting the hand to touch it. For the smaller photographs, it is best to use a piece of wood, a few inches longer than the breadth of the picture, raised at either end by small blocks, which enable you to lay it over such parts of the picture as are not dry, by merely touching the desk on either side of it.

The Easel.—These are of various descriptions. The rack easel is the most convenient, and it is made large to stand alone, or small

for the table: instead of the latter, I use, and prefer, a rack drawing desk, to which I fasten my photographs with pins, and hang my palette on the same.

The Dipper is a small tin cup, made to fix upon the palette. I use two, one to contain oil, and one varnish.

The Palette Knife should be thin, tapering to the end, and there be most flexible. It should also be heavier at the handle than blade. Its use is to temper and rub down the colours before use, and sometimes, as I have shown, it may be used with effect for impasting.

Brushes.—All I have said on this subject for water colours might here be repeated. For photographic colouring in oil, such nicety of touch is required, and such care in manipulation, that the selection of really good brushes is one very important element of success. Brushes are of hog, sable, badger, fitch, and goat hair. All of these are of service to the artist, and I am fond, myself, of having by me as great a variety of brushes as I can secure. I cannot here describe all the purposes best served by various brushes, although such information would, doubtless, be very serviceable, but must merely add, that you may begin with a few red and brown sables, of the usual sizes, and a few hog-hair tools for backgrounds.

Sable Brushes should be chosen as already directed; and in painting such small work I prefer, as is generally done, those made more particularly for water-colour miniatures.

Hog-hair Tools are round and flat. They should be strongly made, and neatly finished. The ends should be of an equal length throughout, without having been cut to such; as in this case a coarse scratchy effect will be produced. You may test for this by the touch: if the ends feel flexible and soft, all is right.

Badger Tools are generally recommended, but few use them; a clean, soft ordinary brush answering the purpose better. A few long-haired camel-hair pencils will be useful for the purpose. The badger tool is sometimes known by the significant name of "softener," or "sweetener." If this tool be too frequently or incautiously used, the beginner will speedily lose the likeness, and produce an effect usually denounced under the term "woolliness."

The Brush Washer contains turpentine for rinsing and cleaning the brushes during or after work.

The Lancet is such as miniature painters generally use, and will be of service in removing any little lumps of colour, dust, or flue that may chance to make their very unpleasant appearance during progress—cleanliness, delicacy, and finish being essential for small pictures.

THE COLOURS.

Flake white,	Extract of vermilion,
Naples yellow,	Mars orange,
Yellow ochre,	Venetian red,
Roman ochre,	Madder lake,
Transparent gold ochre,	Crimson lake,
Roman ochre,	Madder purple,
Raw sienna,	Do. brown,
Brown sienna,	Indian red,
Cadmium yellow,	Rose madder,
Chrome yellow,	Scarlet lake,
Lemon yellow,	Ultramarine,
Indian yellow,	French ultramarine,
Gamboge,	Cobalt,
Italian pink,	Ultramarine ash,
Prussian blue,	Black lead,
Indigo,	Ivory black,
Terra verte,	Lamp black,
Green oxide of chromium,	Vandyke brown,
Emerald green,	Cappá brown,
Brown pink,	Bitumen,
Verona brown,	Raw umber,
Vermilion,	Burnt umber.

Remarks on these colours will be found in an earlier chapter, both in regard to their working, drying, and chemical qualities.

Oils, Varnishes, Magilps, &c.—The word "vehicle," already explained, would comprise all I now proceed to offer a few practical remarks upon. Great research and investigation have been recently devoted to this subject. Sir Humphrey Davy has done much in reference to the materials used by the ancients, and Sir Charles Eastlake has written learnedly and well upon the subject. For me, therefore, it must suffice if I confine myself to such articles as are more commonly used in absolute practice. W. B. Sarsfield Taylor's translation of M. Mérimée's work on the *Art of Painting in Oil*, published by Whittaker and Co., Ave Maria Lane, 1839, will be a most excellent work to procure.

Foreign Correspondence.

Paris, October 26, 1860.

THE French Photographic Society's opening meeting of this session, which was to have taken place on the 19th of October, and upon which I had counted for a host of novelties to be communicated to you, has been postponed because of the absence of the majority of the members. It certainly cannot be the beauty of the end of the season which keeps the photographers away from Paris, for October is as ill-humoured as any one of its elder brothers, the months of Spring or of Autumn, and it is much to be feared that the whole family from January to December will have the same character. Doubtless the absent artists may be found in storied cities, amidst agrestic scenes, or on the mountain slope, lingering to the last to catch the sunbeam which has so long refused to smile upon them. And yet I know some — and more than one — of these laborious travellers who are returning laden with a plentiful harvest. How they have managed I know not, but the results are there to prove my assertion. Thus, M. Braun (of Dornach) has just published a collection of stereoscopic views of the banks of the Rhine. This artist operates with collodion, and nearly always in full sunlight, which gives a very vigorous effect to his productions, and permits him to animate them with groups of persons, so that they become real little pictures; but this time he has been forced to content himself with that diffuse light which falls with uniformity upon the edifice or the landscape. His views certainly lose much by this, but they are not the less interesting. M. M. Bisson, Brothers, who had for this season the most marvellous projects—among others, that of setting up their operating-room on Mont Blanc—have been obliged to limit themselves to completing as far as possible their collection of glaciers, and to reproducing the most curious sites in the new French departments formed of Savoy. At the time that they intended to go and pitch their tent on the top of the giant of the Alps, several English tourists perished with their guides in a tempest, and that upon the very road that they would have been obliged to take. The event was not encouraging to amateurs of super-alpine portraits, so M.M. Bisson have had to postpone the execution of their photographic feat to a more auspicious year. Another of our great masters, M. Baldus, has also executed a series of views taken in Savoy, thinking that the recent annexation of that beautiful country, and the journey of the Emperor and Empress, would, in the eyes of the public, give an additional interest to those eminently picturesque sites. And lastly, M. Soulier, the associate of M. M. Ferrier (father and son), has returned within the last few days from his sojourn of several months in England and Scotland. He had obtained authority to penetrate into the different palaces of the Queen, and to take interior and exterior views of them. His mission would have been greatly facilitated by the kind orders which had preceded him in all royal dwellings, if the weather had not made a point of persecuting him. Imagine what must have been the disappointment of the poor photographer, and the obstacles he had to struggle against, when installed with arms and baggage in a gallery at the far end of a chapel, or in a spacious chamber, into which there penetrated but a feeble ray of light through murky air or falling shower! He had prepared his glasses before leaving Paris, not thinking he should be absent more than a month, and the same glasses served him till his return—a fact which constitutes the greatest eulogy of Taupenot's process that can be offered. In spite of all difficulties, M. Soulier has brought back a large number of stereoscopic *clichés*, which have perfectly succeeded. In addition to fifty views, offering the monography of Buckingham Palace — the royal residences at Windsor, Osborne, and Balmoral—a numerous series of views of London, of the Isle of Wight, of Windsor Park and its environs—he has given us a few subjects from old poetic Scotland. These, as well as all the others, are executed on glass. Among the latter are the ruins of Melrose Abbey, a panorama of Edinburgh, a corner of Loch Lomond, and, lastly, a ravishing view of Loch Katrine. Examined in the stereoscope, this little picture makes a vivid impression upon the mind of the spectator.

> One burnished sheet of living gold
> Loch Katrine lay beneath him rolled;
> In all her length far-winding lay,
> With promontory, creek, and bay,
> And islands that empurpled bright,
> Floated amid the livelier light;
> And mountains that like giants stand
> To sentinel enchanted land.

Nought is wanting but the mild face of Ellen Douglas, listening to the melancholy songs of Old Allen, or rowing to the shore to offer

the aid of her boat and the hospitality of her isle to the wanderer Fitz-James. But I find that I have let mere mention run into description. It is the fault of M. Soulier and his beautiful picture.

To conclude, I have just seen the specimen of a new publication which seems to me well imagined, and not less well executed. It is the *Galerie Contemporaine*, by Disderi, published with a text by Alphonse Karr, whom you must know as one of our wittiest writers, and one of those most savoured by the public. The work appears in numbers, each of which is composed of a photographic portrait, carefully printed upon China paper, and several pages of letterpress. All our celebrities will figure in this book. The price is moderate, and does not exceed that of ordinary illustrated publications.

As our photographers return, I shall have other new works to speak of, and, no doubt, some of the tourists will bring back new processes with them. Let us then wait and hope.

ERNEST LACAN.

New Books.

Notes on the Solar System.

By G. J. Symons.

(London: Stanford, Charing Cross.)

Mr. Symons, as a meteorologist, undertook to make photometric observations during the late solar eclipse, and has published the result arrived at, illustrating the same by means of a photographic proof, showing the gradual diminution and increase of actinic action during the passage of our satellite across the sun's disc. The following extract will explain the *modus operandi*:—

Photometric Register.

The following description of the mode of obtaining the photometric register (of which the accompanying photograph is a reduced copy) has been made rather more detailed than it would have been but for the possibility that some of the arrangements may afford useful hints for future occasions. The paper, after having been sensitised, was fastened on a table by drawing pins; over it was placed a double thickness of the stoutest brown paper, somewhat broader than, and double the length of, the sensitised paper: this opaque covering had an aperture in the middle (about five inches by half an inch); other coverings were then put over, and the whole left in a dark room till required. When taken into the sunshine everything was removed but the perforated cover, the aperture of which being brought over a portion of the sensitive paper, that part was of course exposed to the sun, and therefore it was darkened. At the expiration of five minutes (read off from a seconds watch in front of the observer) the covering was shifted by the breadth of the aperture, the first portion being thus covered and prevented from increasing its depth of tint, and a fresh part exposed by a movement equally easy, instantaneous, and effectual. At the conclusion of the observations the photograph was taken again into a dark room, removed from the table, and fixed in the usual manner.

Though the uniformity of the decrement of colouring was slightly disturbed by the occasional clouding of the sun, the gradual diminution and increase of actinic energy is probably as well shown as it is likely to be during a merely partial eclipse.

In addition to the photograph are tables and diagrams of curves, showing the variations of the thermometer, barometer, hygrometer, &c., as noted by other observers, whose names are quoted by the author.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

DRY COLLODION.

To the Editor.

Sir,—As one of the Liverpool Photographic Club, I have felt some disappointment that no mention has been made in your pages (beyond the report of their proceedings) of the method so successfully revived by several of the members, viz., that of the Abbé Depratz, by introducing a small quantity of rosin into the collodion, and simply washing the plates very copiously, with the addition of invariably re-dipping into the bath just before developing, so as to restore the free nitrate temporarily removed, to ensure their keeping properties. *Vide* the last edition of Mr. Hardwich's work, page 375, and the aforesaid report, in No. 127 of your Journal.

I conclude you have not tried the plan, or we should have had a long eulogium from your able and impartial pen.

That you may be able to form some opinion upon it, I send you a proof taken from a negative so prepared. When I started, the atmosphere was very bright; but, of course, when I reached my destination it was clouded over. As the return train was to start shortly, and I wished to oblige an officer of the company, I had no choice but to expose the plate during so heavy a rain that was by this time falling that a friendly umbrella held over me hardly saved my bellows camera from being spoiled. The time was exactly three minutes, fourteen-inch focus, two and a quarter diameter of lens, and half-inch diaphragm. You may see the opening was large by the lines at the outer edges; but by what other method of dried plates will you obtain the definition of the foliage, as marked by the fir and the tree beside it, with the almost entire absence of actinic light? I think you will admit that the Manchester system of salting, with the further trouble of washing just before using (not always practicable), hardly comes up to this. This plate had been prepared a week before, and was snatched up at a minute's notice. Nor was my second shot inferior; for as my slide is double-barrelled, I could not resist banging away right and left—so bagging my other bird *malgrè* the pelting of the rain.

While on the subject I may mention, in answer to your querist, in the last number, who signs himself "Inquirer," that I was informed by the lady he speaks of that she always uses Fothergill's process *pur et simple.* Her only peculiarity of invariable success consists in most *plentiful washing*, which, she avers, is no "mere matter of opinion;" and that she never opens her camera unless the sun shines, and then the time is rarely less than six minutes—whereas, with rosin in the collodion, the same light would operate effectually in one minute. *Ecce signum!*

Should your readers be tempted with this statement, and, upon trying, find their film have a tendency to split up and peel off upon drying, however tough and firm it may have been at the first washing, let them, after clearing with cyanide, and gently but efficiently washing the plate and slightly draining, then flood over the plate a mixture of one part of albumen to two of water, and then set up to drain and dry: their gratifying specimen of labour saved, and process simplified, will adhere to the plate, I'll answer for it.—I am, yours, &c.,

October 19, 1860. C. COREY.

[We reserve our remarks upon the preceding till our next.—Ed.]

"THE OPTICAL GHOST."

To the Editor.

Sir,—Will you allow me to occupy a few lines in reply to Mr. Francis's letter on "The Optical Ghost?"

The fact of several persons having seen the mock sun, or whatever it may be, without the intervention of any lens, I think puts the ghost out of court; but, even were this not so, surely the figure would have been a misty crescent, and not a perfect disc, if it had been caused by any reflection in the lens. With respect to its only appearing when the darkness was greatest, such is not the fact, as it exists in No. 5, where the sun is more uncovered than in No. 1, and in this picture it is somewhat *darker* than the white cloud beside it; and it seems to me that any reflection from the lens or mounting must fall on the plate as an excess of light, and not less luminous than its surroundings. These and many other things about the image and its position induce me to believe it really was in the sky, and in some way connected with the eclipse. I may mention that a somewhat similar appearance was noticed and photographed, by Mr. T. R. Williams, during a former eclipse, on which occasion he was induced to photograph by first seeing the image. Several of his friends who were with him also observed it.—I am, yours, &c.,

Middlesex Hospital, Oct. 25, 1860. CHARLES HEISCH.

PHOTOGRAPHY ON WOOD.

To the Editor.

Sir,—Can you, or any of your numerous readers, inform me if there have been any patents granted for the production of photographs on wood taken *directly in the camera*, and which will admit of the insertion of the engraver's tools without the *chipping off* of the surface of the prepared block, thereby rendering the photograph useless as a guide to the engraver?

I am aware that patents have been granted relating to the "printing of photographs on wood" for engraving purposes, and which produce a *reversed impression* of the subject when engraved and printed from the wood block.

My reason for thus troubling you is, that having perfected a process for producing photographs on wood *directly in the camera*, I wish to ascertain if anyone has produced similar results before me, as I should be very sorry were I to make my discovery known, and some one to immediately claim the priority of the invention, which, you are aware, has often been the case lately respecting processes in the photographic journals.

Some five or six years ago I tried many experiments to obtain photographs directly on wood, so as to be reversed as in the manner of all drawings on wood, and in each experiment succeeded, so far as regards the perfectness of the photographic image; but, upon my attempt to engrave the subjects, I was annoyed at finding, upon each insertion of the graver, a piece of the photograph chip off, consequently preventing my proceeding any further.

The chipping was caused by the prepared surface being too thick; and, at the time, if I made the surface thinner, the nitrate of silver would enter the pores of the wood, and stain it, which was another great drawback, as the engraver would then, in a great measure, be unable to see the nature of the engraving as to the *fineness* or *coarseness* of his work.

However, I can now obtain them to my satisfaction, as the photograph is as perfect in detail, &c., as a positive on glass—the surface does not chip off, the wood is not stained, neither is its nature altered in the slightest; and the engraver will find no more difficulty in engraving than on an ordinary drawing on wood.—I am, yours, &c.,

Birmingham, Oct. 24, 1860. JUSTITIA.

FADING NEGATIVES.

To the Editor.

Sir,—I am much annoyed at the fate of most of my old negatives, and shall be exceedingly obliged if you or any of your readers can suggest a remedy. After a time, more or less, they begin to show spots and stains, commencing generally from the edges of the glass, and gradually extending over the whole picture, completely spoiling it. The stains, however, sometimes appear in patches unconnected with the edges. Whatever care I take the result is the same; and negatives taken only a few months ago are beginning to suffer in the same manner. My own impression is that it is due to damp, as the other surface of the glass is always moist from that cause, even speedily after being dried at the fire, from, I suppose, its hygrometric nature. I use the best plates, obtained at Thomas's, and his chemicals. Perhaps you will also kindly answer the following queries, which may have a bearing on the above point:—

1. Which is the best mode of fixing with hypo.?—placing the plate on a levelling stand, or immersing it in a solution of hypo.?
2. Is it best to remove a small portion of the collodion film all round the edges, after fixing, so that the varnish may extend beyond the film?
3. What varnish is the best for negatives? I use the amber and chloroform, being so very convenient of application.
4. How can the hygrometric tendencies of the glass be obviated?
5. What boxes are the best for storing away negatives? I find the above results happen equally in metal, deal, and mahogany.

I am sorry to be so troublesome, but I fancy there must be some other means of obviating this destructive tendency, and I am sure you will help me.—I am, yours, &c., MEDICUS.

Bristol, October 26, 1860.

[It is possible that your negatives may have been imperfectly cleared of the hyposulphite of soda, or that they may have been varnished before the film was thoroughly dried: in either case the fault would cause the defect. Glass made with a superabundance of alkali would be hygrometric—a condition which would bring about the same result. For this there is no remedy but that of using a different sample of glass. Negatives should on no account be kept in a damp situation. Whatever be the primary cause, decomposition of the pyroxyline by moisture in contact with it is the immediate cause of your annoyance. In reply to your queries:—1. Immaterial, but immersion is more likely to disturb the film.—2. We think it is. Without doubt it adds neatness, and is somewhat of a precaution against damage to the edge of the film.—3. Soëhnée's, sold by Gaudin and others. Amber and chloroform, when good, is very good; but the quality is very uncertain. The only objection to Soëhnée's is that it requires heat in application.—4. Impossible to remedy it, if existing.—5. We prefer those made of tin: next to them mahogany.—Ed.]

RECOVERY OF SILVER FROM OLD BATHS.

To the Editor.

Sir,—Would you have the kindness to inform me, in your valuable Journal, how I could get pure nitrate of silver from my old baths? I have several pints, but they are too acid, or something of the sort, so that I cannot work with them. If I have to evaporate, would you inform me how?—I am, yours, &c.,

A YOUNG PHOTOGRAPHER.

[Add to each pint of bath half an ounce of common table salt dissolved in an ounce of water; and when the white and clotted chloride has settled, collect it on a cloth, and let it drain and dry in a warm place. The operative chemist will give you pure nitrate of silver in exchange for it; or it may, if you prefer it, be run down into a button of silver, by mixing it with four times its weight of carbonate of potash and carbonate of soda, equal parts, and projecting the mixture, a little at a time, into a Cornish crucible heated strongly at a blacksmith's forge. All the materials must be quite dry.—Ed.]

RECLAMATION.

To the Editor.

Sir,—In The British Journal of Photography I see your correspondent, "Simeon Headsman," describes a tourist's camera brought out by Messrs. Burfield and Rouch, of the Strand, London: at the same time he mentions one of similar construction he saw at Messrs. Shepherd and Co's., Farringdon Street. I do not think the camera worth being styled an invention; but any merit due to the designer of it I certainly lay claim to. I did not (as he says) furnish Mr. Eidmans with the design, but with an old camera which has been in use the last seven years. There is one peculiarity in the camera he does not mention: the lens is 1½ inches diameter, taking pictures 8½ by 10½ inches, the definition of which is not surpassed by any lens in the market, be it orthoscopic, orthographic, or any other with a new name. This camera was exhibited at a meeting of the London Photographic Society four or five years ago (the year Mr. Fenton was in Yorkshire), along with views in North Wales, taken with it; but, when I mentioned the smallness of the lens, the thing was ridiculed, and myself looked upon as one trying to dupe the Society.

I should not have written to you on this subject at all but that in your number for this day I see that Messrs. Horne and Thornthwaite have copied my design for a tripod, which was sold to the public along with the tourists' camera. Mr. Bland, of Fleet Street, was shown one of these tripods, and I believe purchased one at the time. If further proof be necessary I will at any time refer you to the optician who made the tripod for me, and also to parties who purchased them. In conclusion, I think it would be but honest if dealers manufacturing articles already in the market would give a little of the honour, if none of the profit, to the designer.—I am, yours, &c., J. W. RAMSDEN.

Leeds, Oct. 15*th*, 1860.

[Our correspondent does not seem to perceive that there is no difficulty in taking a large picture with a small lens; but the difficulty consists in taking a large *angle* of picture with a small lens.—Ed.]

AUTOMATIC WASHING-TROUGH.

To the Editor.

Sir,—Since the first introduction of Taupenot's process I have been in the habit of using a washing-trough, modified in form, but on the same principle as that described and figured by "H.," at page 299 of your current volume. I have found it all that could be desired for washing plates under personal superintendence; but, with an eduction siphon of a capacity much larger than the feed-pipe, it cannot be trusted to as self-acting, and it is not therefore to be depended on for the washing of prints to be left to themselves for a prolonged period. A siphon of four times the capacity of the feed-pipe, as spoken of by "H.," cannot *fill* except with help or by accident, and cannot therefore empty the trough automatically. Such a siphon, if of the common form and under ordinary circumstances, can only be depended on as an overflow pipe, the trough remaining full to some part of the level of the siphon's bend. "H.," or some other correspondent, can, perhaps, suggest a means of overcoming this difficulty. If overcome, I cannot imagine a less troublesome or more effectual system of thorough washing.

What occurs to me as a *simple* plan is the constriction of the siphon tube at some point on the exit side of the bend, the object being to secure, if possible, the filling of the tube in the first place, with the least amount of friction afterwards, when the action of the siphon has commenced.—I am, yours, &c., WM. CHURCH, Jun.

[Possibly the addition of a valve to the bottom of the long leg of the siphon, formed by a disc of metal, covered with india-rubber, and arranged somewhat after the fashion of a beam balance, might do. It should be weighted on the opposite end of the lever, so as to press the disc up against the bottom of the tube, and the weight should be sufficient to retain a column of water within one inch or two as long as the tube.—Ed.]

ALBUMENISING, &c.

To the Editor.

Sir,—I have no teacher but that which your valuable Journal affords. I have commenced taking negatives, and I do not succeed at all well. Enclosed is a specimen of one of my attempts, and I should feel much obliged if you would point out its defects in your next number, in order that I may endeavour to improve. The negative of the print sent was taken by a single lens, and treated with bichloride of mercury, and afterwards with a solution of iodide of potassium poured over it.

I have at command any quantity of fresh eggs, and feel very much inclined to albumenise my own paper. Will you have the kindness to give me a good formula, and say also whether the paper is salted just before floating upon the albumen? Is the formula given in answer to "No Chemist," in your last number, for dry plates? or for albumen for paper? By answering the above questions in your next Journal, you will greatly oblige.—I am, yours, &c., OLD MUFF.

[We can by no means acquiesce in the correctness of the signature adopted. The specimen received, though not anything like perfect, is far better than many that we see which are regarded by the producers as successful efforts.

Your negative is *under-exposed;* the lights and shadows present too marked a contrast—half-tone being deficient. With a proper collodion there is not the slightest need to use the bichloride of mercury to intensify, but a sufficient density can be obtained at once by the first development. The collodion you have employed is most likely *too thin;* add more pyroxyline to it, or get another sample to wash with.

In albumenising paper you do *not* salt it first—the object being to keep the image on the surface of the paper as much as possible. You should add from fifteen to twenty grains of chloride of ammonium to each ounce of albumen; or, what is better, dissolve the salt in a small quantity of water, and add it before beating it into a froth, which may be done by several convenient methods—for instance, by shaking it up in a large wide-mouthed bottle; by beating with a bunch of quills; or, easier than either, by the apparatus of Mr. Noton, figured in a former number. The frothed albumen will all have returned to the liquid state in about forty-eight hours, when, after filtration, it is fit for use.—The formula mentioned was for dry plates.—Ed.]

METALLIC SPOTS ON ALBUMENISED PAPER.

To the EDITOR.

SIR,—So much complaint continues to be made by the consumers of albumenised paper, on account of the innumerable metallic spots upon the surface, that any means by which this great annoyance can be prevented, or at least mitigated, should be used.

With regard to the cause of these spots, many attribute them to being in the pulp of the paper in its manufacture. This may be to a certain extent probable, but, from experience, I have proved the great cause is in the rolling of the albumenised surface,—the public generally looking so much after a beautiful surface, to obtain which, in the rolling, great pressure must be used: thus the particles of metal which, by friction, are broken off the cylinders are firmly embedded in the paper. If the manufacturers of albumenised paper were to carefully dry and press it well, and in that state supply the public, this great vexation, I am certain, would be overcome; and, when the fine and glossy surface is required, that can be obtained by afterwards having the pictures rolled when mounted and finished. This plan would be appreciated by the photographic houses, who are too frequently blamed for faults in paper over which they have no knowledge or control.—I am, yours, &c.,

October, 1860. J. S. EIDMANS.

[It will be noticed that the assertion made in the above letter, relative to the source of the metallic spots, agrees with the views expressed by Mr. C. Jabez Hughes, in his paper on the subject.—ED.]

ENCOURAGEMENT OF ART.

To the EDITOR.

SIR,—If you have not yet seen the annexed advertisement, it must surely be owing to the innate *modesty* and *forbearance* of the principals at South Kensington, whose well-known consideration for trade interest (*vide* a big blue book) naturally prevents them from attempting to damage legitimate speculation.—I am, yours, &c., QUASHED.

[ADVERTISEMENT.]

GRAND NEWS! GLORIOUS NEWS!!

Works of Art at less than a tithe of their value!!!

MESSRS. Carbon, Greentomb, and Co., having been assisted with almost unlimited means by that well-known capitalist, Mr. John Bull, have, with an *entire disregard to expense*, fitted up an establishment for pursuing the art of photography at the classical locality well known as the BROMPTON BOILERS, where they have determined to supply the public with photographs of WORKS OF ART at prices that will *defy competition*.

Indeed, far from taking into consideration such a low view of the subject as that of profit, the charges have been fixed at a rate so moderate that the articles may with truth be said to be

ALMOST GIVEN AWAY!

N.B.—A branch at Great Russell Street, Bloomsbury.

INTRODUCTION OF PHOTOGRAPHY AS A BUSINESS.

To the EDITOR.

SIR,—I have waited for the appearance of three numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY, to see if some patriotic individual more able than myself would take up the cudgels against your American correspondent, Mr. Seely. But, as no one else seems inclined to show fight, I cannot let another opportunity pass without attempting the defence of British photographers.

The paragraph in Mr. Seely's letter that I more particularly wish to notice is the one beginning with the startling piece of news that "photography was first made a business in New York, and they were New Yorkers that inaugurated the business in London." I really owe Mr. Seely my best thanks for enlightening me on this subject; for I suppose I must have, during the last twenty years, been labouring under a series of false impressions of a most absurd nature. I had always thought that Messrs. Claudet and Beard were the introducers of the daguerreotype into England, but it seems it is not so. I had also fancied, most stupidly, that the daguerreotype was first made a business in *Paris*, but I suppose I was wrong. How much I have been in error too about photography proper! I had always fancied that Messrs. Henneman and Malone, Cundall, Hennah, Laroche, and Fenton were the first "inaugurators" of photography in London; but in that I am also mistaken—or are these gentlemen just named all New Yorkers in disguise?

But a truce to joking, for the next paragraph contains a serious insinuation:—

"We have no Daguerre, Talbot, Archer, or Hardwich here, but we have men who can put their ideas into action." (!)

Now, if I understand the English language rightly, this means that these great men are nothing but idle visionaries, putting forth ideas that other men, New Yorkers no doubt, put into practice. We all of us know what Talbot and poor Archer have done for photography, and we have daily proofs of what Mr. Hardwich is now doing for it—nowhere better, perhaps, than in the articles from his pen that appear in THE BRITISH JOURNAL OF PHOTOGRAPHY. Will Mr. Seely produce a book, I care not by whom, in which there are more "ideas put into practice" than in the last edition of this author's work?

I call on Mr. Seely, as an American gentleman and an honourable man, to withdraw so obnoxious an insinuation, and to do justice to both living and dead by apologising for this unfortunate paragraph. I cannot fancy that Mr. Seely could have written it deliberately; and I feel sure that although his letter, as he acknowledges, has a tone somewhat *apologetic* and *boastful*, it is *not*, as he afterwards says, "a fair expression of American sentiment on such subjects."

I have said nothing in defence of M. Daguerre, his talented and courteous countryman, M. Lacan, can do it better than I can.

MRS. SPRIGGINS'S "TWO-PAIR-BACK."

P.S.—Mrs. S. would have written herself but is laid up with the spasms, having been dreadfully *worritted* by the goings on at the Brompton Boilers.—M.S."T.P.B."

ANSWERS TO CORRESPONDENTS.

QUERIST (Leeds).—An achromatic meniscus.

F. N. D.—Apply to Messrs. Frith and Hayward, Reigate.

SECUNDEM ARTEM.—A very small one is of no use for the purpose.

THOMAS J.—Maxwell Lyte's toning bath. Hollingworth's third paper.

EUGENE.—Cyanide of potassium, because it injures the lights less than the other.

G. M. R.—We have no notion of doing anything of the kind. If he wants an opinion let him seek it in the usual way.

R. M.—You can cut the india-rubber with a pair of scissors with readiness if you immerse it in water during the operation.

The answer to your second query will be found by referring to the letter of "A Young Photographer" in the present number.

S. MOSELY.—A gutta-percha tray will do very well for what you require. If you have any doubt about its cleanliness, use a few drops of dilute nitric acid.

STARTLING FACT.—We have no faith in the writer you mention: a very little astonishes him. He is a bit of a wondermonger, if we may coin a word for his benefit.

INTERIOR.—We think that, for your present purpose, you had better adopt our own honey process, or else Mr. Sedgefield's plan of washing in distilled water before exposure.

DREADFUL MUFF.—Procure a pneumatic holder and your difficulty will at once disappear. It is wonderful that any one manipulates without these very convenient tools, seeing that their cost is but trifling.

J. R.—Read the "Letters to a Photographic Friend," recently published in this Journal, and you will find a description of several operating tents, boxes, &c. You will then easily be able to select that which suits you best.

SPOTTY.—Your dilemma is one easily got out of: you have simply forgotten to saturate your nitrate bath with iodide of silver. Coat a plate, and immerse it, leaving it in all night, and you will most likely find that the bath will work properly next day.

F. SCOTT.—Mr. Francis Bedford took many of the same Welsh scenes that were previously exhibited by Mr. Fenton—the former adopting a more manageable size, viz., about ten inches by eight inches, though those appear to be somewhat larger than you ask for.

AGATHA.—We should not hesitate for an instant as to which of the two to select—that at £35, decidedly. There is no comparison between the two. However, we never recommend large lenses to amateurs; they are never so satisfactory in performance as smaller ones.

CALOTYPE.—We do not think that you will do any good in taking stereographs by any modification of that process. Perhaps the turpentine waxed-paper process, introduced by the Rev. Mr. Sisson, may answer your purpose if you will not use glass. A pamphlet on the subject was published some time since by Messrs. Marion and Co., Regent Street, London.

KELVEDON.—If you will turn to our number for the 1st October, in the present year, you will find an article extracted from the *American Journal of Photography*, which article was read before the American Society, and contains all that has been published on the subject. We must, however, add that, in our opinion, the writer has probably given fancy the rein, and it has rather run away with him.

J. H. SLATER.—If you use black varnish to stop out a sky, it should be applied to the back of the glass; partly in order to avoid injury to the negative, and partly to soften the otherwise hard outline. We believe, however, that the best plan is to print a proof, and then, *without fixing it*, cut out the sky very neatly; then expose the sky part to the light to blacken and fix it in the ordinary way. It may then be carefully attached to the sky of the negative.

G. F. W.—The foot in the tripod was hinged at the bottom as you have found out: it was an omission on our part not to have stated as much. If for dry plates you would find Hare's suit you. The fifth on your list is very good; but we suspect that the cost will not be less than that which you say frightens you. If you work wet plates in the field you might readily make your own camera, using no dark slide at all. We shall probably have something to say about the process indicated in our next. We have heard nothing at all of our correspondent since the abrupt close of the last letter we published.

SCEPTIC.—The light you mention *is* adapted to portraiture. The specimens are *not* equal to those taken by ordinary daylight, nor is it possible that any mode of artificial illumination can *equal* daylight, because the shadows can never be quite the same, as you will readily perceive by looking at any person—first by the side of a window, and secondly with a lamp or candle on one side of him; in one case the rays of light reach him in parallel lines, in the other by diverging ones. Still, the instrument is very useful, and, when judiciously applied, gives very good results. Your note reached us too late for reply in our last.

A NOVICE, R. T. D.—Thanks for the specimens. You cannot materially quicken old collodion; if too highly coloured, some benefit may arise from immersing a slip of pure silver or cadmium in it, to remove the excess of free iodine. We do not think you need any other book than Hardwich's: the fault of which you complain may be due to the *albumen*, which, in the process you employ, should be carefully filtered, after having been frothed, as it is not washed off as in the Fothergill process. Gallic or pyrogallic acid is better for this process than an iron developer as a rule. There is no need to lose faith in dry processes: the error is solely in the manipulation somewhere.

J. R. A.—The specimen labelled "blisters" is so crumpled that we cannot rightly judge of the cause of their appearance: it is not improbable that they are due to too great pressure in obtaining an artificial gloss on the paper. The reddish granular appearance on the card portrait is evidently due to the paper having been prepared with albumen in an improper state, probably that which has not been sufficiently frothed, and containing portions of different density. On careful examination, the reddish marks are seen to assume a tolerably regular *rippled* appearance. If the albumen used be properly prepared, then it is owing to some fault in the drying: one of the two we are certain it must be—that is, either the albumen or the albumenising operation. Your third specimen is an unmistakeable case of "measles" in a mild form. Disderi's lens is one of four inches (from back lens) focus, not diameter. Of course pyrogallic acid is added. Negatives are best kept in a racked box; but, if you want to store a large number at little cost, you can do so by gumming a thick piece of card at the back of each angle, which will keep the plate from touching the next on which it is laid.

*** Mr. Hughes's paper, *On the Mechanical Adaptation of Portrait Lenses for View Purposes*, with many others, is deferred till our next number.

All EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this* Journal *should be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 130, Vol. VII.—NOVEMBER 15, 1860.

Those learned in mythological lore assert that even Jupiter occasionally nodded; it is not to be wondered at, therefore, that a mere editor should sometimes be "caught napping." At the meeting of the Manchester Photographic Society, held on the 3rd ult., a paper *On a Modification of the Collodio-Albumen Process* was read by Mr. John Parry, which may be found at p. 298 of the current volume. We have been informed, by the courtesy of the editor of a contemporary, that Dr. Ryley feels aggrieved at our having inserted that paper without drawing attention to the fact that the method of operating therein proposed was introduced by him nearly a year and a-half ago, and that the *principle* involved was advanced so long back as the 15th July, 1858, in a letter from him which we published in our issue for that date. We never voluntarily abstain from giving due credit to those who have introduced any useful suggestion; and on the present occasion our having omitted it arose from inadvertence. When we perused the proof of Mr. Parry's article the remembrance of Dr. Ryley's previous experiments naturally occurred to our mind, and we intended noticing the fact; but we were just then deeply engaged upon the examination of the South Kensington iniquity—a subject of such absorbing interest that, like Aaron's rod, it swallowed up all the rest; and we must frankly admit that our indignation on that score fairly obliterated for the moment any recollection of this matter.

At the two meetings of the North London Photographic Association, held in April and May, 1859 (reports of which appeared in vol. 6, pp. 110 and 137, of this Journal), Dr. Ryley explained, and exhibited specimens produced by, the method of operation erroneously supposed by Mr. Parry to be new, and which he will perceive, on reference to the number for the 1st May, 1859, p. 110, was described by Dr. Ryley in almost the identical words employed by Mr. Parry in his paper. As regards the theory propounded, we are by no means prepared to accept as proved that which has been advanced by these gentlemen; but certainly the use of hot water appears to be capable of advantageous application, whether for the purpose of coagulating the albumen or otherwise. So, without being too nice about the cause of its utility, let us accord thanks to Dr. Ryley for introducing it, and to Mr. Parry for drawing attention to it anew.

At the last meeting of the South London Photographic Society, a paper *On the Photogenic Action of Colour* was read by Mr. S. Clarke (see p. 313); a subject which, we are convinced, would well repay a systematic investigation. Our object in referring to this paper at present, however, is to draw the attention of its author to certain considerations which appear to have escaped him, and to some little omission of particulars from his article. With reference to the omission to which we allude, he says, in describing experiment 8, that it "is merely a piece of sensitised albumenised paper exposed to the action of the three primary with their complementary colours," and then proceeds to compare the effects produced upon the albumenised paper and upon collodion; but in neither case is it stated what sensitising materials were employed, or whether they were identical in both cases—an omission which appears to us to nullify the value of any observation. We take it for granted that the light was allowed to act on both surfaces by transmission through coloured media; but we would direct attention to the fact that the nature of the colouring matter employed materially influences the result. It was demonstrated, at a meeting of the Blackheath Photographic Society, that porcelain slabs, tinted in various colours, by means of vitrification in contact with oxides of different metals, when photographed presented some curious contrasts; but especially that, in one instance, where the same colour to the eye was produced by two various metallic oxides, when photographed a marked difference in the result was noticed. This point does not seem altogether to have escaped the notice of Mr. Clarke, for he makes allusion to the subject in connexion with red flowers; but he regards it as "unaccountable," while no mention is made of the fact that the presence or absence of bromides or chlorides in the same "vehicle" materially influence the sensibility to certain of the coloured rays.

We trust that upon some occasion, at no distant time, probably in continuation of the previous paper, Mr. Clarke may furnish the missing particulars, and thus render available for future use that which at present is too incomplete to act as a safe point of departure towards further conclusions.

The mounting of photographs has always proved a minor trouble to amateurs: it is generally regarded as a "messy" job and a piece of drudgery. But for the unpleasant scent of turpentine, which very pertinaciously adheres to proofs mounted with the india-rubber solution, we regard that material as the best for the purpose, although it requires a little knack in its application. We have, however, been much pleased with an elegant method suggested by Mr. J. Stuart, of Glasgow, in a paper *On Printing and Toning*, published in our last Number, pp. 114 and 115. It consists in covering the backs of the proofs with *patent starch paste*, and allowing them to dry. After trimming the edges they are ready for mounting, thus:—With a wet sponge damp the cardboard all over, apply the print to be mounted in the proper place, put the two faces downwards on a lithographic stone, cover with the tympan and pull through the press. Mr. Stuart asserts that he can thus mount 100 in an hour, and we have no doubt that he can. We think this plan deserves attention, and as for the absence of a lithographic press being a difficulty, a very simple substitute could be got up at a moderate cost that would perfectly carry out the principle involved. Other adhesive materials might even be employed in a similar manner: it is the method of operating which is new to us.

We have with this number the pleasure of placing before our readers a specimen by the new process devised by Herr Paul Pretsch, for producing blocks for illustration that are adapted for surface printing by the common printing-press, or "platen"

printing machine, in conjunction with the ordinary type. The specimen now given has been printed at a "platen" machine, driven by steam power. It must not be forgotten that this is no attempt to supersede photographic printing, but simply to apply photography, in connexion with the electrotype, to the illustration of periodical and other literature in the same manner as is now in common use with wood-cuts. For subjects having much elaboration of detail, the gain both in time and cost may be reckoned as very considerable, even in the present state of the process; but, as the inventor is still continuing his labours on it, further advantages may yet be anticipated.

ON THE PROCESS OF MESSRS. PETSCHLER AND MANN; ALSO, ON TWO EFFECTS PRODUCED BY A CONTINUED ACTION OF THE SAME CAUSE, VIZ., NEGATIVES CHANGED INTO POSITIVES.

By J. Kibble.

[Read before the Glasgow and West of Scotland Photographic Society.]

The intense interest excited by the communication of Messrs. Petschler and Mann, at one of the Manchester Photographic Society's meetings, on the destructive influence of a coating of chlorided albumen when in contact with the ordinary washed sensitised iodide of silver surface, induced me to make a few experiments to satisfy myself to what extent the chloride rendered iodide of silver non-sensitive to light, as, from former experiments on the destruction of actinism, I had arrived at a conclusion somewhat different to the general opinion formed by their experiments. So as to prevent any misunderstanding of the few remarks I am about to make, I may state that plates prepared as follows, viz., sensitised, washed, coated with chlorided albumen (two grains to one fluid ounce), dried, exposed for several seconds to the influence of unobstructed daylight, immediately washed to remove the albumen; exposed for two minutes in the camera against an object; after exposure, flooded all over with a fifteen-grain solution of nitrate of silver, developed with the ordinary protosulphate of iron developer—will, in about one minute, be as free from all fogging as if the sensitive surface had been subject to actinism in the camera only. Yet, notwithstanding, as my after experiments will prove, the iodide of silver *is* sensitive to light when in contact with chlorided albumen; but is so far retarded by the chloride on washing, that an image formed in the camera, subsequent to washing off the albumen, will completely develop with a proto-salt of iron, before the previous action of light on the unwashed plate has time to manifest itself. In proof, a sensitised plate, washed, coated with the chlorided albumen, after being drained and dried by artificial heat in the dark chamber, and, while still warm, exposed in the camera for two minutes against a building about fifty yards distant, immediately on being taken from the slide, was washed under the water tap for one minute; a fifteen grain solution of nitrate of silver was then poured over and off it; the iron developer being applied, in about three minutes the high lights of the image made their appearance; in about two more all the details were *distinctly* visible. Although by no means such a negative as an aspirant would relish, it was quite sufficient to prove that iodide of silver is sensitive to the actinic rays when in contact with chlorided albumen.

These statements may appear a little paradoxical at first, but can be explained in a very simple and satisfactory manner. Imagine a sensitive surface (such as the ordinary wet process gives) to be exposed in the camera *twice*, each time to a different object; the first exposure to be one *second*, the next one *minute:* it is quite obvious, on the developer being applied, the longest exposed will make its appearance and thoroughly develop before the slightest trace of the shortest exposure becomes visible. Now, if the developing be discontinued, it might be said the short exposure had not any effect: neither has it, as far as visibility is concerned; but had the development been continued, it assuredly would have manifested itself, and a confused image have been the result. This, in one sense, I consider quite analagous to the unwashed and washed collodio-albumen plates, the whole being caused by a mere difference or increase in the time of development: in one instance, by the retarded chloride on the *long* exposure; in the other, the *short* exposure acting similarly to a retarder in giving slow development. The actinism under exposure of unobscured daylight is so far destroyed by the act of washing off the chlorided albumen—which will, on entering into solution, exercise its maximum chemical effect—that an image formed in the camera by a few seconds of action on the *washed* iodide of silver will, under the developer, manifest itself, and thoroughly develop without being interfered with by the actinism of exposure to open daylight, which is retarded, or partially destroyed, by the chloride, in addition to that, the dry iodide of silver not being so sensitive. But to this there is a limit, as the following highly-interesting experiment will prove:—Expose one of the unwashed collodio-albumen plates (which has been prepared in the dark chamber) for *four* minutes to the influence of an image in the camera. Having done so, wash it under the water-tap for one minute, and again expose in the camera to the same object; but this time let the plate occupy a position at a right angle to what it did formerly, and let the exposure be *one* minute, or one-fourth of previous exposure. This effected, pour over the plate a little of a fifteen-grain nitrate of silver solution: after having inclined it in all directions, pour it off, and flood all over with the iron developer. Now mark the result: towards the expiration of two minutes two images become visible, at a right angle to each other, as nearly as possible of the same intensity.

After having developed for two minutes, should the image not be bold enough, wash off the decomposing fluid, and repeat with silver and iron alternately until satisfied. The specimen I now produce was done exactly as given. You will observe there are four different specimens. The first was exposed in the camera for two minutes with the chlorided albumen in the *wet* state over it—a very satisfactory proof that even the wet chloride is only a retarder. The second is the same in every respect, but exposed twice to the same object:—first for *three minutes* in the unwashed state; the second time for *ten seconds* AFTER being *washed*—the plate also at a right angle to its former position. You will observe the longest exposure under the action of the chloride has developed without any interference from the short exposure on the washed surface; but in the third instance the result is very different, although all but the time of exposure is identical. Four minutes' exposure of the unwashed and one minute of the washed give as nearly as possible the same result: both images appear equally distinct. The fourth specimen differs from all the others in one respect only. After exposure, instead of washing with water, a weak solution of nitrate of silver was used for that purpose; the object being to convert the chloride of sodium into chloride of silver in the act of solution, so as, if possible, to destroy the action of the salt on the latent image. In this instance, also, the image developed but slowly; indeed the obstruction presented to the developer by the coagulated albumen holding chloride of silver embodied in it rendered the experiment comparatively worthless. To obtain satisfactory results, the chlorided albumen should be thoroughly washed off previous to using a developer which contains silver. The sixth plate, you observe, is an ordinary collodio-iodide of silver (no albumen), which was washed, and, after drying by artificial heat, exposed in the camera for two minutes; taken from thence, steeped in water, exposed again for *one* minute, at a right angle to former position, then flooded with weak nitrate of silver. On applying the developer, both images appear simultaneously, and of nearly equal force. In a former experiment, in which the times of exposure were the same, the one image came out much in advance of the other. As far as these experiments go, the dried iodide of silver appears to have lost one-half of its sensitiveness which it gains on being wetted. It is more than probable both states have lost their sensitiveness to a certain extent by the drying.

The day on which these last experiments were made was so dull from fog that distant objects could not be taken with the camera; hence the reason that a lithographic portrait was made use of. Should similar experiments give similar results with others, the question naturally suggests itself—Will this process be suitable for instantaneous results? This I leave for those who pursue this fascinating science to ascertain. It must be borne in mind that all of the above experiments were exposed and developed immediately after preparation. It is possible, indeed highly probable, that sensitive surfaces which have been exposed to the influence of light, and retained in the dark chamber or box for days previous to development, may have the action, which in my experiments is only retarded, wholly destroyed by the prolonged action of the moist chloride. But that point also I leave for some of you who have better opportunities than I have to investigate.

I now beg to call your attention to some remarks I made at one of our former meetings under the title of *Influence of Light and Heat in Changing the Physical Properties of Bodies*, where I state:—"It is well known to all of you that a certain amount of exposure of one of the sensitive surfaces, viz., iodide of silver, to the actinic rays produces a certain effect which is again destroyed by a prolonged exposure. Indeed I attribute the great success in producing what is

termed instantaneous results to accident in shutting off the exposure in the camera at that particular time when the intense light, such as from clouds and water, at the angle of reflection has, as it were, to a certain extent neutralised the actinic force after it had reached its maximum—the action of the high lights *decreasing*, whilst the feebler lights *increase* their force." I now lay before the meeting a proof not only of its being possible to balance the action of an intense and a feeble light, but to cause the feeble lights to make their appearance under the developer first as *positive*, and the intense lights to come out slowly afterwards as the negative portion of the image. In the specimen exhibited you will observe there are two objects at a right angle to each other. The positive was obtained by an exposure of *ten* minutes, the negative by *one* minute. When the intense light of the face in the *second* exposure falls upon the intense light of the background of the *first* exposure, it subjects that particular portion of the sensitive surface to actinism for twelve minutes, or the combined exposures. The intense light acting continuously for such a time appears to have neutralised the action established to such an extent that the feebler lights, not having exercised their maximum effect, but continually increasing in force, take the position of the high lights under moderate exposure, and come out first; the reduced action by over-exposure appearing last. I trust it will be understood that all the remarks I have here made apply to the experiments the results of which I have now laid before the meeting. I had many more to make, but the foggy state of the atmosphere wholly precluded me from doing so. To Mr. Alexander M'Nab I am very much indebted for the use of his laboratory, also for the time and trouble he expended in manipulating, I being a mere looker-on during the operations. I observe he is present and can testify to all I have stated. On some future occasion I trust to have the pleasure of entering into the second branch of this subject, or its converse, viz., *two* causes producing *one* effect.

I am of opinion we ought as a society to give a vote of thanks to Messrs. Petschler and Mann for the very unreserved manner in which they have given their interesting discovery to the photographic world.

ON THE APPARENTLY INCORRECT PERSPECTIVE

OF PHOTOGRAPHIC PICTURES PRODUCED BY LENSES OF DIFFERENT FOCAL LENGTHS,

As usually viewed or looked at, which may be considered as a kind of Apparent Distortion.

By J. Rothwell,

Inventor of the Method of Constructing Photographic Lenses free from Distortion.

[Read at a meeting of the London Photographic Society, November 6th, 1860.]

In commencing, I wish to observe that, although some few photographers understand all that I shall attempt to elucidate, yet the great majority, not having studied optics, are completely mystified to account for the anomalies of which I am here trying to show the causes, the why and wherefore. It is a common remark by people that such and such objects are too large or too small, and the answer generally is, that "it is only imagination; it is correct, and cannot be wrong: it is impossible." But I think I shall here prove that almost all photographic pictures are more or less incorrect apparently.

I propose to treat the above subject under three heads:—

1st.—The apparent enlargement of objects approaching the margin, and diminution of those about the centre of photographic pictures produced by lenses of short focal lengths, by which I mean those under twelve or fifteen inches; and, on the contrary, the apparent enlargement of objects about the centre, and diminution of those near the margin, produced by lenses of long focus—those over twelve or fifteen inches.

2nd.—The apparently excessive enlargement of *near* objects, and extraordinary diminution of *distant* ones.

3rd.—The monstrous enlargement of objects approaching the margin, caused by those objects being out of focus, in addition to that caused by their being situated in the margin, as demonstrated under the first head.

I am supposing the lenses to be without distortion on my principle, as illustrated in a paper read before the Photographic Society by J. H. Dallmeyer, Esq., optician, and not the common view-lens, or portrait combination, which would further complicate the matter by their distortion.

Proposition 1.—*Theorem.*

In the first place I assert that in looking at all photographic pictures, to be seen in correct perspective, the eye must be placed at the point where the aperture of the stop was when taking the picture.

It is an incontrovertible truth in optics that the *angle* under which an object in a picture is seen, to be correct, must be exactly the same as the angle under which the object itself is seen in the natural view, whether that object be a near or a distant one.

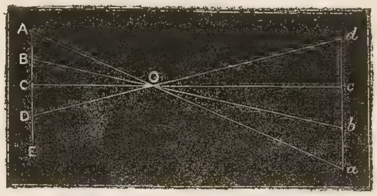


FIG 1.

In *fig.* 1, A E is the picture or plate, and O the aperture of the stop; *d c*, *c b*, *b a*, objects seen under the angles *d* O *c*, *c* O *b*, *b* O *a*; and A B, B C, and C D, the images of those objects as seen under the angles D O C, C O B, and B O A. Now it is demonstrated by a well-known theorem in geometry, that angles on the opposite sides of a straight line D *d*, bounded by the same straight lines D *d* and C *c*, are equal; therefore the angle D O C = the angle *d* O *c*: and so also with the other angles. It is axiomatic that the picture object D C will appear of the same proportionate length and breadth as *d c*, the object itself; therefore, under its true dimensions in all respects when looked at from O, whether the picture be near or distant, that is, taken with a long or short focus lens.

And to prove this more completely, and also to prove that, when the eye looks at a picture from any other point than that above indicated, thereby causing apparent distortion, and, in the particular case stated below, to show the amount or actual variation from true perspective, we must investigate fig. 2, which will require close attention, as the subject is somewhat complicated and elaborate.

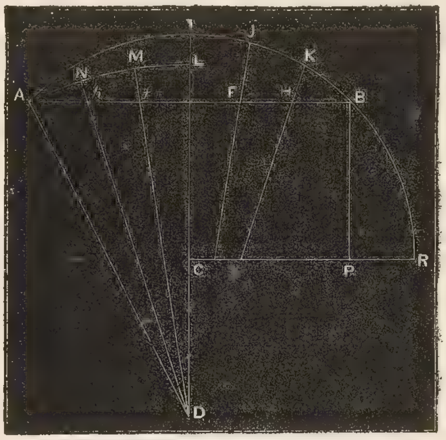


FIG 2.

Proposition 2.—*Problem.*

Referring to the right-hand side of the *fig.* as C I R, A B is the plate or picture, twelve inches across (I am supposing we are looking across the plane of the picture); I D the axis, perpendicular to the plate; E C is six inches, the focal length of the lens with which the picture was taken: therefore C E B is a right angle; and to find the hypothenuse, by the theorem on right-angled triangles, $\sqrt{}$ [(E B, half the length of the plate, 6 inches)^2 + (E C, 6 inches)^2] = C B = 8,4852. Now, using C B as a radius, strike the arc R B I A, then draw the line or radius C R perpendicular to the axis I D, by which it will be parallel also to E B; then draw the line B P perpendicular to C R and E B, by which it will be parallel to E C; then C E B P is a square, and therefore B P = E C = E B, consequently as the sine B P = sine E B, the arcs R B and B I are equal by proposition in trig., and as the angle I C R is a right angle, the arc I B R = 90°, by cor. to def. in trig.; and therefore, as the arc I B = the arc B R and the two together being = 90°, the arc I B must be 45°, being the half of 90°. Divide the arc I B into three equal

parts or segments, then each of those equal segments will $=15°$. Lastly, draw the lines C J and C K, cutting the picture in F and H. I have taken a very wide field of view—90° (I have included between 80° and 90° in a number of pictures on flat plates), whereby to show and explain the matter more palpably.

Now, the eye placed at C, looking at the three divisions of the picture, E F, F H, and H B, they will appear all of the same size, in consequence of the three angles being equal: and yet those three parts are not actually equal; to prove which I now proceed to ascertain their exact lengths, which is the problem to be solved.

By proposition in trigonometry, "In any triangle, the sides are to one another as the sines of the angles opposite to them," and by inversion (by problem in geometry, C E F being a right angle, the other two angles E C F and F E C are equal a right angle; therefore, E C F being equal 15° by construction, subtract this from 90°, which leaves the angle E F C = 75°); and as ·933, sine of $\angle$ E F C, 75°: Side E C, 6 inches : : 2588, sine of $\angle$ E C F, 15° : Side E F = 1,6643, which is one of the divisions of the half picture E B. Again, by the same proposition in trigonometry (and by the same problem in geometry), subtract the $\angle$ C H E = $\angle$ E C F, 15° + F C H, 15° by construction, = 30° from 90°, there remains the $\angle$ E H C = 60°; therefore, as ·866, sine of $\angle$ E H C, 60° : Side E C, 6 inches : : 5, sine of $\angle$ E C H, 30° : Side E H = 3,4642; and by subtracting E F, 1,6643, from E H, 3,4642, there remains 1,7999 = F H, the middle part of the half picture E B. Next subtract E H, 3,4642, from E B, which by construction is six inches, and there remains H B = 2,5358, the other division of the half picture E B.

We have now solved the problem, and found the lengths of the three divisions of the half picture E B, viz.:—

$$\begin{aligned} EF &= 1{,}6643 \\ FH &= 1{,}7999 \\ HB &= 2{,}5358 \\ \hline & 6{,}0000 = EB; \end{aligned}$$

which was the thing proposed to be done.

Proposition 3.—*Problem referring to the left-hand side*, D I A, fig. 2.

Suppose the eye to be now placed at D, twelve inches from the plate, and looking at E A, the left-hand half of the picture. Divide E A into three parts respectively equal to the three parts into which the right-hand half of the picture is divided, the lengths of which I have found by the preceding proposition. Thus, make

$$Ef = EF,\ fh = FH \text{ and } hA = HB.$$

Find the hyp. of the right-angled triangle D E A, thus:—

$$\sqrt{(AE,\ 6\text{ in.}^2 + ED\ 12\text{ in.}^2)} = DA = 13{,}4164.$$

Now, taking D A as radius, strike the arc A L; next draw the lines DfM and DhN. The problem is to find the angles EDf, fDh, and hDA, to discover whether the parts Ef, fh, and hA (as seen under those angles from D) appear equal, as they did when viewed on the right-hand half of the picture from C, and if not, to what extent they vary from equality, and consequently from true perspective. Find the hyp. Df of the right-angled DEf, thus:—

$$\sqrt{(ED\ 12^2 + Ef,\ 1{\cdot}6643^2)} = Df = 12{\cdot}1062;$$

then, calling Df radius, as Df 12·1062 : Ef, 1·6643 : : 1 : nat sine = ·1374 = 7° 54′ $\angle EDf$. Find the hyp. Dh of the right-angled triangle DEh, thus:—

$$\sqrt{(ED,\ 12^2 + Eh,\ 3{\cdot}4642^2)} = Dh = 12{\cdot}5;$$

then, calling Dh radius, as Dh, 12·5 : Eh, 3·4642 : : 1 : nat sine = ·2771 = 16° 5′, $\angle EDh$; therefore

$$\angle EDh,\ 16°\ 5' - \angle EDf\ 7°\ 54' = \angle fDh,\ 8°\ 11'.$$

Again, as D A, 13·4164 : E A 6 inches : : 1 : nat sine, 4472 = $\angle$ E D A, 26° 34′; therefore, $\angle$ E D A, 26° 34′ − $\angle EDh$, 16° 5′; = 10° 29′, $\angle hDA$.

We have now solved the second problem, that is, ascertained the angles EDf, 7° 54′ + fDh, 8° 11′ + hDA, 10° 29′ = 26° 34′; and by dividing 26° 34′ by 3, we have three equal angles of 8° 19′ 30″ each; and to see the three parts of the half picture E A with the eye at D, all apparently of the same size, as we did with the eye at C, it is evident that each should be viewed under the equal angle 8° 19′; but instead of this we have the angle EDf 7° 54′, that is, 25′ too small; the angle fDh 8′ too small, and the angle hDA 2° 10′ too large.

By the foregoing synthetic course of reasoning, I have demonstrated indisputably that all photographic pictures, particularly those taken with short focuses, when looked at from a greater distance than the focal length of the lens with which the picture was taken, appear under incorrect perspective, that is, the marginal objects appear too large and the central ones too small; and, on the contrary, it is also evident (which can be proved) that when any photographic picture is viewed from a shorter distance than the focal length of the lens with which the picture was taken, the central objects will appear too large, and the marginal ones too small. The general conclusion to be deduced is, that it is not advisable to include a wide field with short focus lenses, except in taking groups in some cases, and in which the operator has not sufficient distance to place his camera. But in taking pictures with long focuses (12 inches and upwards) there is no objection to include the widest field possible, because a picture taken with a 12-inch focus will be of such size that, to look at all the picture at once, it will be held at least that distance from the eyes, and therefore appear correct; and so on with longer focuses and larger pictures.

2. The apparent enlargement of near objects and diminution of distant ones.

I have two (what I conceive to be satisfactory) explanations on this subject. The first is, that near objects, in the majority of views, are situated near the margin, and distant ones in the centre; and if the picture has been taken with a short focus, I have demonstrated in the three preceding propositions that in this case, that is, when the near objects are in the margin, those near objects will appear too large, not because they are near, but in consequence of being in the margin, and that the distant objects, being in the centre, will seem too small.

The second explanation is, an optical illusion, which I will elucidate presently.

I believe that it is a universal practice with all photographers in taking views—yes, and groups too—to so arrange matters as to have near objects about the margin, and distant ones about the centre, if possible. Why? Every photographer knows why,—simply by so doing to get everything in good focus, in consequence of the curvature of the image; and from this practice, and what I have previously demonstrated, the majority of pictures have the evils the causes of which I have made manifest in this paper.

The second explanation, the optical illusion, is that the eye, when looking at a distant object, has not, at the same instant, a clear impression of a near object, because of that near object being out of focus in the eye; the result of which is that we do not get a strong, clear, or correct notion of the comparative sizes of near and distant objects at the same instant. Suppose two poles of equal lengths, both in the centre of the view, one at ten yards distant, the other at forty yards. If we look at the near pole, the eye accommodates itself to that distance to bring it into good focus,—*i. e.* clear sight; but, by so doing, it puts the distant pole out of focus, makes it indistinct, and *vice versâ*, by looking at the distant one; and our notion of the comparative sizes of the two poles is acquired by looking first at one pole and then at the other. But in looking at the images of the poles in the picture, the case is altogether different, for there the images are both the same distance from the eye (being both in the centre); and, in consequence of this, the eye gets a distinct view of both at the very same instant, whereby, and for this reason, we are struck with the comparative—apparently excessive—unnaturally great difference betwixt the sizes of the images, or pictures of the poles.

From this explanation of this optical illusion, it is manifest that it is immaterial in what part of the picture the poles or other objects are situated; but when the two causes are conjoined, as in the picture of a long street-view, then it requires both the first and second explanation to account for the very great and apparently incorrect perspective. In the case of a picture having a near (large) object in the centre, and distant ones receding towards the margin, the apparently incorrect perspective of such a picture is, to some extent, corrected by the same causes which produced the bad perspective in the case under propositions 2 and 3, and what remains uncorrected is readily explained by optical illusion. The apparently incorrect perspective of the picture of a long row of houses standing obliquely across the picture is easily explained by the first and second explanations together; for the near end of the row appears too large, because it is in the margin, and the farther end seems too small, by reason of optical illusion, although it is corrected to some extent by being in the opposite margin; for, if we look at the farther end, we do not see, at the same instant, the near end clearly; and *vice versâ;* but, in looking at the picture, we take in the whole view of it at once, and then occurs the optical illusion.

Under this head, too, I may refer to the case of the great—shall I say hideously deformed?—images of objects (the objects themselves not being in the same plane) produced by placing the camera very near those objects when taking them, whether using long or short focusses. The worst features of this case occur, almost universally, when taking a single portrait—that is, a portrait of one person.

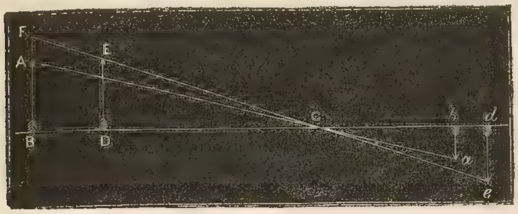


FIG 3.

Proposition 4.—*Problem.*

In *fig.* 3, suppose A B to be an object 18 inches long, and 6 feet from the camera, C the aperture of the stop, and $a b$ the image of A B. Now, remove the object A B 18 inches nearer the camera, and place it at D E; its image, in consequence, will be enlarged (and advanced to $e d$) in the proportion of D E to B F, or $b a$ to $e d$; required, the quantum of enlargement. Because (by theorem in geometry), D C E and B C F are similar triangles, and C D = C B 6 feet—B D 18 inches; therefore C D = 4 feet 6 inches,—thus, as C D, 4 feet 6 inches : C B, 6 feet :: D E, 1 foot 6 inches : B F = 2 feet; and therefore D E, or $e d$, appears one-fourth larger. Now, if we suppose in the case of a portrait of a single person, the hands at D E, and the head at A B, or still further off, it is evident that the head will be considerably too small, and the hands a great deal too large, and that, to get the portrait approximating anything near apparent correctness, when the camera is placed so near, everything (head, hands, knees, &c.) must be nearly in the same plane. Let the camera be placed now four yards from the sitter, and, by the above reasoning and similar calculation, it will easily be found that the object D E will be enlarged only one-eighth of an inch, or half of that of the above case; therefore it is quite manifest that it is better to place the camera at four yards distance, using a longer focus to produce the same size of picture, than to place it at two yards distance, using a shorter focus to produce the same size of picture; in addition to which, there are the evils under propositions 2 and 3.

3. The monstrous enlargement of objects approaching the margin, caused by those objects being out of focus, in addition to that caused by their being situated in the margin, as demonstrated under the first head; and sometimes, also, may be added the evils caused by the camera having been placed a very short distance from the sitter, as explained under proposition 4.

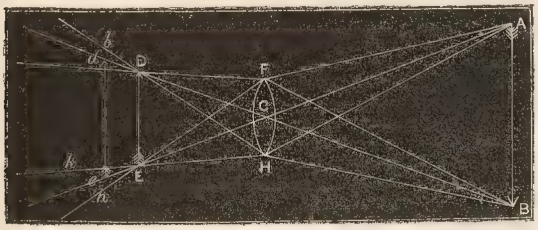


FIG 4.

Fig. 4.—Suppose A B to be the object, D E the image of that object in proper focus, and $e d$ the image out of, and beyond, the focus, F H the lens, and C its centre. Now, if we take the cone of rays, F A H, issuing from the point A, and, after passing the lens, being concentrated at E, and then, after passing E, diverging to the points $k e h$, forming there an indistinct scattered focus, it is evident that, by the outermost ray diverging to h, the image will be thereby indistinctly extended beyond what it ought to be,—that is, it comes to h instead of to e; and so also with the other cone of rays, F B H, being concentrated at D, and then the outermost ray diverging to b instead of to d, by which means the whole image will be indistinctly and greatly enlarged above its natural size. Now, if we suppose A B to be the hand of a sitter, it is quite plain that that hand will be indistinctly and greatly enlarged; and so also will it be with any other objects similarly situated,—thus proving what I asserted under this head.

I should scarcely consider this paper complete without showing the causes of the incorrect, the shocking bad perspective of vertical near objects, especially tall ones,—such as high square towers being converted into the frustrums of quadrilateral pyramids, buildings apparently tumbling into streets, &c., &c., caused by what is commonly called "cocking the camera."

All vertical objects ought to be photographed, if possible, with the axis of the lens horizontal. Suppose a tall square tower, the lens, with its axis horizontal, E F the plate, vertical, and parallel to the tower. Now it is evident that, in taking a picture of the tower in this manner, the image of the upper part of the tower will be situated in the margin of the picture, and the image of the lower part of the tower near the centre; and, in consequence of what I have demonstrated under propositions 2 and 3, the upper part of the tower will appear too large, and the bottom too small; and I have shown, under the second head, that, on the contrary, by optical illusion, the upper part of the tower, being the most distant, will appear too small, and the lower part, being the nearest, will appear too large. Now it is very evident that one of these evils will counteract the other, and the result is that we obtain a picture approximating to correctness, which will be found to be the case by experiment.

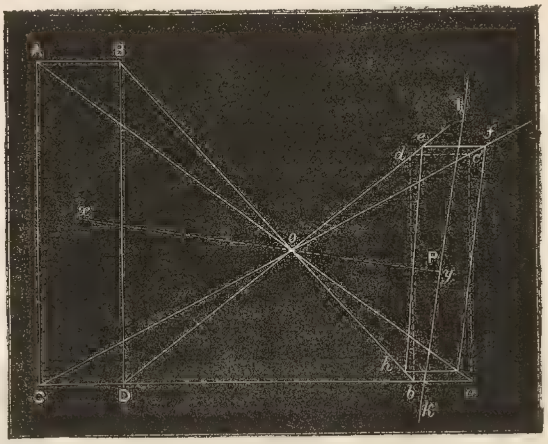


FIG 5.

In *fig.* 5, we will suppose the axis, $x y$, to be pointed to x at half the height of the tower, and the plate inclined to the perpendicular, as at I k. Now it is evident that, by the plate being so inclined, the lower half, P k, will cut the angle $b o a$ at $h g$,—that is, nearer its vertex o, and, as a sequence, $h g$, which subtends that angle, will be shorter than $b a$, which also subtends the same angle,—that is, the width of the tower will be narrower at $h g$ than what it was at $b a$, and by similar reasoning it will be plain that the image, $e f$, of the lower part of the tower will be larger than what it was at $d c$; thus, by "cocking the camera," and directing the axis upwards, the shape of the picture of the tower becomes that of a frustrum of a quadrilateral pyramid,—that is, the corners of the tower incline inwards from the base upwards, and yet, notwithstanding, the corners from the bottom to the top remain straight lines. This case, considered vertically, is exactly similar to the long row of houses standing obliquely to the plate (referred to under the second head), and considered horizontally.

We have only to suppose the open end of a street substituted for the tower, and, by the reasoning under *fig.* 5, it will be readily comprehended that the corners D A, C B of the buildings at the corners of the street incline outwards into the street from the base upwards, as if they desired to come down together into the middle of the street.

In conclusion, I wish to observe that a photographer is surrounded, as it were, with numerous evils in connexion with his lenses and mode of operation, and it has often been remarked, in relation to lenses, that "if you gain one advantage, you lose another,"—and so it is; and in this paper my object has been to show the causes of some of those evils, and to enable him to avoid them as much as possible, thereby to obtain the best and most correct results.

ON THE MECHANICAL ADAPTATION OF PORTRAIT LENSES FOR VIEW PURPOSES.

By C. Jabez Hughes.

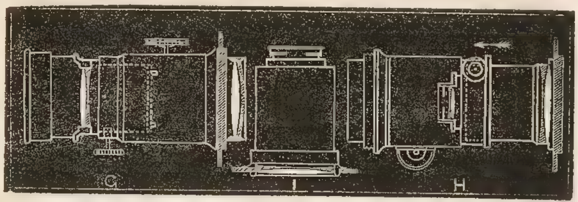
[Read at the meeting of the South London Photographic Society, October 18th, 1860.]

Many persons attach great merit to the fact that they can use the front lens of their portrait combinations as a single or landscape lens, it being a well-known fact that the general form is similar. It should be remembered, however, that in taking portraits the convex surface is turned outwards to the object, but for views it is turned inwards towards the camera. The size and position of the diaphragms being also different in the two cases, the mounting of the lens must vary according to the purpose for which it is to be used. I do not propose here to discuss the advisability of thus employing lenses: it is sufficient that they can be and are so used, and that different makers have exercised great ingenuity in adapting their brasswork for the purpose. To these various devices I propose to invite your attention, and I think we shall have occasion, in passing them under review, to express our admiration of these adaptations. Almost every maker has his own method, and some have patented their plans. Let us take first one of the earliest and best makers, Voigtländer, and see how he accomplishes the task. He first separates his tube from the flange; into this flange he screws an *adapter*, that is, a brass ring with a smaller aperture: the front portrait lens is then removed and screwed from the back into this adapter; a brass cell with small diaphragm in front is then pushed on to the lens, and it is ready for use.

[Mr. Hughes then changed the various parts of a Voigtländer lens, as described, and handed it round to the members. This arrangement, though ingenious, is so very inferior to the devices of other makers, that we are contented with giving the above description. In some of the more remarkable adaptations we have used diagrams to render the description more clear.]

Ross adopts a more simple plan. He removes the hood from the front, unscrews the back lens, and reversing the cell containing the front lens, puts it in the place of the back lens; a series of diaphragms are then fitted in and it becomes a complete single view lens. The rack-work is made thus equally serviceable for landscape and portraits, and the body of the tube serves for a hood or shade. This plan is very simple and efficient, the cell with diaphragms being the only additions to the portrait combination.

[Mr. Hughes handed round one of Ross's No. 2 lenses fitted as described.]



[In the above diagram A shows a section of the Ross portrait combination; B represents the front lens reversed with the additional diaphragms for landscape uses. It is but just to Mr. Ross to mention that though he kindly supplied Mr. Hughes with an example of this mode of mounting, he does not recommend his front lens to be thus used generally, but prefers to supply a separate lens better adapted for the purpose.]

Horne and Thornthwaite have a different method. They take out the front portrait lens, and, reversing it, screw it into a regular single lens brasswork, and, except with the flange, make no attempt to use the portrait lens brasswork.

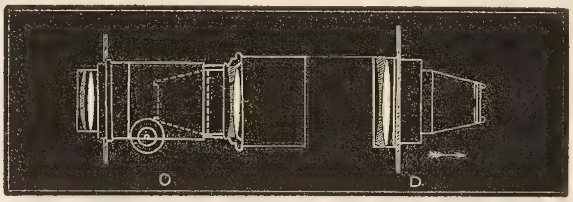
[One of Messrs. Horne and Thornthwaite's lenses was handed round, in illustration, and was in no respect different in its mountings to an ordinary single landscape lens.]

Lerebour, I believe, has two different arrangements for this same object. Neither of his plans, I am assured, are remarkable for ingenuity. I am sorry I have not been able to secure one to show you. Lenses of this adaptation by this maker are not common.

The late C. Shepherd adopted a neat arrangement. It is still manufactured by the firm bearing his name, and to whom I am indebted for the example shown. It is somewhat in the rough, being got up at short notice for this meeting; but you will perceive the principle is still the same, using the front portrait lens reversed, and placing diaphragms in front.

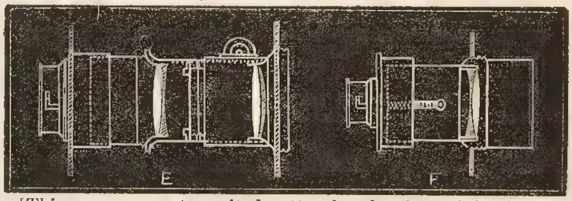
[This arrangement being rather antiquated, and moreover, open to some of the objections made against it in the course of the discussion which followed, we have not thought necessary further to describe it.]

The introduction of central diaphragms has enabled many opticians to combine appliances to serve both purposes. For example, here is Millet's arrangement:—At the back of his front-portrait lens he attaches a tube, and at the end of this tube is the central diaphragms. When this front lens is removed, and reversed for landscape work, the same tube is in its proper position, and furnished with stops.



[Diagram O shows section of Millet's ordinary portrait lens, the central tube indicated by dotted lines; D shows the arrangement for landscapes.]

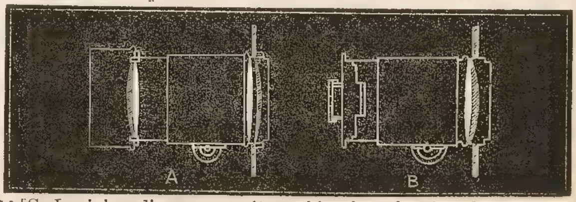
Hermagis, in his patented method, has made a very daring innovation. He cuts his tube in two parts, right through the rack, midway between the lenses. One of these screws into the other, and the stops are introduced at the intersection. When required for single lens purposes the two halves are separated, the back one removed from the flange, and the front half screwed in its place by means of a thread left on the hood; the diaphragms are then in their proper place, and, by an ingenious arrangement, that which formed the cap of the portrait lens becomes the hood and cap also of the single lens.



[This arrangement excited attention by its originality and ingenuity. E shows the Hermagis portrait arrangement; F, the adaptation for landscapes.]

Most of you will remember a peculiar and cumbrous mode of mounting his lenses that was patented by Jamin; the back lens being larger than the front, and having what he called a "centralising cone." In this arrangement the tube was in halves, one screwed on from the outside of the camera and the other from the inside. But though clumsy and inconvenient it was the foundation of his present method, which is certainly the most elegant and ingenious that has come under my notice. In this lens we have for the first time three lenses instead of two. Midway between the front and back lenses is an arrangement for central diaphragms, or for this third lens. This latter may be used or not in connexion with the portrait lenses, but its main service is in connexion with the front lens used as a landscape lens. It shortens the focus so that a sharp flat picture can be obtained in the usual camera, whereas the ordinary single lens requires an unusually long camera to be employed. The arrangements for changing the parts are very simple. By means of an extra tube the front and back lenses are instantly attached or detached. It is difficult in words exactly to describe it, but you see the instrument in my hands and the ease with which the several parts are transposed.

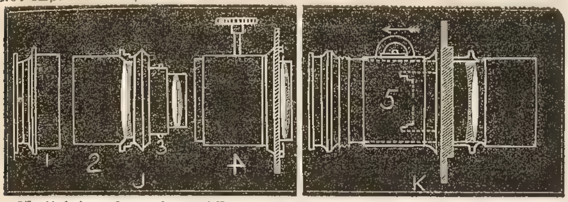
[Mr. Hughes here described minutely the different appliances of Jamin's Patent Treble Portable Combination, which excited great admiration.]



[G, Jamin's ordinary portrait combination, showing the arrangement for central diaphragms or additional lens; H, the Jamin

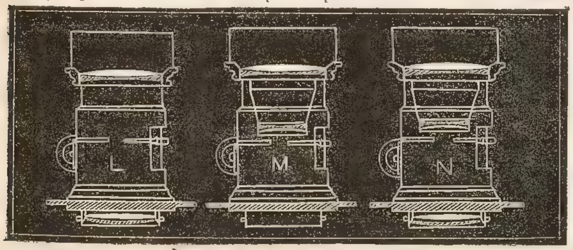
orthoscopic or double landscape adaptation; I the single lens arrangement of long focus for large pictures.]

The next lens I introduce is Derogy's. In this arrangement more is attempted than any other. The lenses consist of the usual portrait combination and two additional ones—one for lengthening, the other for shortening the focus. First we start with the usual portrait combination as it is now. To make a smaller or larger picture we separate the lenses, which is very easily done by these bayonet joints, and insert the long or short focus supplemental lens. To use it for single-lens purposes we separate them thus (disconnecting them), and remove the back lens, and in its place put the front lens reversed; to increase or decrease the size of the picture one or other of the supplemental lenses is to be used in addition. The whole arrangements are very simple; but, whether more is attempted than can readily be reduced to practice, I will not express an opinion.



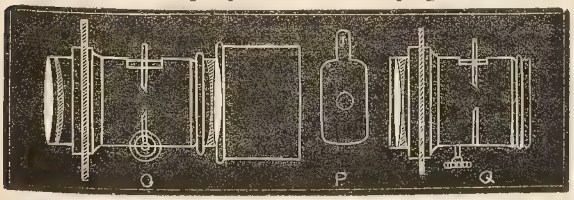
[J, disjointed section of Derogy portrait lens, showing—1, cap of lens; 2, front half of portrait combination, with bayonet point in section; 3, position for central diaphragms or additional lenses to lengthen or shorten the focus (a lens *in situ*); 4, back half of portrait combination, which unites withfront half, 2, by bayonet point. K, Derogy lens for landscapes; 5, position for diaphragms, or additional lenses to increase or decrease the size of pictures.]

The next lens is Mr. Slater's, with his Petzval Combination. It consists of the usual portrait combination with a negative focus lens used between. It makes an excellent instrument for groups when the central lens is used, as it gives more generally distributed definition than any other I know of, and is the only lens I have used that gives the head, feet, and centre of the body of a standing figure sharp at the same time. This peculiarity is entirely due to the central lens. To use it for landscapes it is only necessary to remove the back lens. It is provided with Waterhouse stops that are equally suitable for landscapes or portraits.



[L, Mr. Slater's ordinary portrait combination, showing Waterhouse stops; N, the same combination, but with a negative focus achromatic lens inserted in the centre forming the Petzval arrangement; M similar to N, but with the back lens removed, forming an orthoscopic and landscape lens.]

Before I conclude, allow me to introduce one other lens that is as remarkable for its simplicity as some of the others are for their complexity. It is introduced by myself, and therefore I do not feel at the same liberty to dilate upon any of its merits. It is sufficient to say that it is the most simple and inexpensive of any on the table, and I feel convinced will be found in practice to be as efficient. It is only necessary to remove the back lens, place the front one in its place, and the portrait combination becomes a landscape lens, as the diaphragms are so placed that, without moving, their position is equally suitable for each purpose.



[O, Mr. Hughes's portrait combination, showing position of diaphragms; P, Waterhouse or central diaphragm; Q, landscape combination.]

I have now introduced to your notice the greater number if not all of the modifications adopted to use the front lens of a portrait combination for views; and though I should like on a future occasion to listen to a discussion on the fitness of the said lens for the proposed object, yet I think at present enough is before us to express opinion on the many ingenious plans to render yet more useful our already invaluable portrait combinations.

REMARKS ON FAILURE, AND SOME OF THE CAUSES OF FAILURE, IN ALBUMENISING, PRINTING, AND TONING OF PHOTOGRAPHIC PICTURES ON PAPER.

By James Ewing.

[Read at the Glasgow and West of Scotland Photographic Society, 1st Nov., 1860.]

Mr. Stuart, in his paper treating of the particular method by which he albumenised, printed, toned, and mounted photographs on paper, touched on one or two points relative to the cause of different phases of failure, which being again referred to by others of the members, caused some brisk discussion, and has induced you, sir, and the other members, to set aside this evening for the further consideration of the same. In opening the business of the evening, I hope, as I shall have occasion to refer to points mooted in papers previously read before this Society, that the gentlemen who have honoured us with such papers will not feel themselves aggrieved by such references, as it is in the spirit of a searcher after truth I shall do so—not from any personal motive or splenetic desire.

Science presents too noble an arena for us to enter on it encumbered with petty feelings, which only retard the progress of truth, and serve to dull the keenness of our vision in penetrating into the secrets of nature—secrets which, as we discover them, teach us how harmonious are her laws, and of how much benefit it would be to ourselves "could we the bright example take." In our particular branch of science and art—for photography is a combination of both—there are many difficulties to be overcome, requiring much patience, method, and cleanliness, as often, even with those valuable requisites, failures do occur. Consequently, as we have met together as a society for the furthering of the interests of photography, it is right that we should, with the spirit of friendly rivalry, endeavour to clear away such difficulties; and I do not think there is a better way of doing so than by calmly discussing our failures, tracing as nearly as possible their causes, prescribing a cure, or, if possible, showing how to avoid such failures *in toto;* and if we happen to differ in our opinions, as very likely we shall, let such difference not be mistaken for bad feeling, but rather as a desire on the part of all to wait for further evidence.

In times past it seemed to be a point with professional photographers, in serious conclave assembled, not to show anything but what was good in the shape of specimens: failure was only known in the sanctum or operating-room; and as soon as it appeared was most ungraciously put out of sight, and, if possible, tried to be forgotten. By this error much was lost—time, material, and, more, the chance of improving by the lesson of a recent failure; in fact, failure was only known in the columns of some photographic journal, where queries in regard to the cause of failure appeared under the quaint cognomens of "Young Photo.," "Old Hypo.," "Sel d'Or," or "XX.," which host of queries would have required the aid of some Athenian oracle to unriddle, instead of the attention of an ordinary editor. But things have altered. We know not why, except the couplet of Alfred Tennyson will answer, and it really appears to answer—

> "I doubt not through the ages one increasing purpose runs,
> And the thoughts of men are widened by the process of the suns."

And seeing that the business of photographers is so much mixed up with "the process of the suns," no doubt but their thoughts have become very much widened, and hence the change that they now boldly step out to show their failures as well as their successes; and perhaps the exposition of such failures may do more good for the advancement of the science than the quiet show of success arrived at through a labyrinth of difficulties misunderstood and uncared for. Let such difficulties be cleared away—success must follow.

If I am bothered with a difficulty and you know how to solve it, do so, and *vice versâ;* or if we are both bothered, let us put our

heads together to find it out. "Two heads are better than one," is the old adage, and it holds good even in this matter. Now I will tell you of a great difficulty which stands in our way, and that is a want of permanency in our productions: our toning and printing have not as yet given us anything that we can, with any assurance, term "permanent."

To make photographs as permanent as possible should be the aim of every lover of the art, the want of such permanence being one of the great barriers in the way to the adoption of costly photographs by the public in general; and it is one of the most particular items to which our attention should be directed, as by overcoming this difficulty photography will be placed on a surer footing, and be able to class with the sister arts—printing and lithography.

Perhaps some of the gentlemen present may have tried Sutton's process: rather over four years ago he claimed for prints produced by his method a degree of permanence not to be had by any other method, and which seemed to be highly spoken of at the time by Sir David Brewster. Mr. Sutton declared at that time that they were not only more permanent, but that they improved by age. Surely this was the great desideratum met, and yet I do not know of any one in Glasgow having adopted the process; although since then I have seen many beautiful photographs, which looked clean and imposing when first mounted, assume through time that "sear and yellow leaf" tint so annoying to photograph collectors. Certainly this fact demands great attention, as we are very far from having overcome this serious difficulty. What avails our printing and toning if we cannot get the pictures to last? What avails the softness of touch and the beauty of colour, exhibited by our first-class artists, if the pencilling on which they work evaporates in a few years, "leaving only a wreck behind?"

The contemplation of such a fact is very annoying indeed, and it begins to assume a more grievous phase when such theories as those given birth to by our President (and in one of which I am afraid there is too much truth) rise grimly before us:—"That the very salt we use as our fixing solution acts simply as a wash to thin the atoms or molecules which constitute the front of our picture, these atoms being covered with too thin a coating of gold to resist actinic action when mounted and exposed."

"In very presence of the regal sun" bursts the thin shell and evolves the very substance that gave the picture birth, to the entire destruction of the print—photographers' and artists' work. Such theories, when backed by plausible experiment, should be carefully conned over—tried if possible to be exploded—or, if their foundation rests on solid truth, let them serve to prompt us to greater exertion in the making our work permanent.

In printing it is always requisite to have a good negative, as you can never produce a good picture from a thin or misty negative. A great deal depends on this, as I assure you the alkaline bath cannot be used unless you have a good dense plate; if you have not, the resultant picture will be thin, bleached, and cold, but with a good negative you can produce fine results. Mr. Stuart's pictures, exhibited at the last evening of our meeting, were practical illustrations of such. The advantage this bath has over the *sel d'or* is, that there is less bother in connexion with it, less tendency to engender acid principles, and consequently it involves the chance of rendering the prints a little more permanent, which is a "consummation devoutly to be wished." With the *sel d'or* bath a moderately dense negative may be used and still produce a good picture, seeing that it does not require any overdoing of the print; but great care must be exercised in the process:—such as washing them for a long period in clean water, placing them in a bath of weak ammonia, washing again, toning in a solution of gold, hyposulphite of soda and hydrochloric acid; again washing in ammonia, again in clean water, at last fixing in strong hyposulphite of soda, and, finally, washing for a long period. With the old hypo. bath there was little or no trouble compared with either of the foregoing, and yet I have seen prints quite as clean and beautiful produced with it as with any of the former. It being the oldest method, its faults, in point of permanence, may be more readily observed. But when we place it before the theory of our President—a theory he kindly requested us to consider, and which, if correct, gnaws at the root of our whole art—it will bear away the laurels in point of permanence, seeing that the alkaline and *sel d'or* baths tone the prints previous to their immersion in the strong hyposulphite bath; the consequence is, that the hyposulphite acts very keenly in the darkened parts, thinning their coating of gold, and, as a consequence, rendering them more apt to be acted on by the actinic rays than the prints which are toned by the old hypo. bath, seeing that the chloride is reduced as much as it possibly can be before the action of the gold commences, which action, being prolonged, gives a deeper coating, and renders it more able to withstand actinic action. I will now for a short time advert to part of the matter advanced by Mr. Stuart in his paper read at our last meeting. The first item made reference to the permanence of photographs toned by the alkaline bath, in contradistinction to the old system of toning; and he produced two prints of the same age, showing distinctly a yellowing of the whites, which I presume was not the case when they were first mounted. To have made the experiment complete, however, Mr. Stuart should have produced a print toned by each of the two baths, of the same age, and, if possible, with the understanding that the one was as carefully manipulated as the other. The next item Mr. Stuart made reference to as leading to failure seemed to me to be the laying of the albumenised sheet on the surface of the nitrate bath, in which he regretted the mode suggested by Thornthwaite, and advanced, as a better method, that of beginning at one end of the sheet and carefully letting it down until it came in contact with the solution. This we all admit. But further, continues Mr. Stuart, this must be done as carefully as inserting a collodionised plate into the bath, as a stoppage will leave a streak or wave over the whole sheet. Of this I am not so certain, although, had I not been bothered with this same twelve months ago, I certainly would have accepted Mr. Stuart's remark. But happening to have by me a print which I kept as an example of this wave line, as also of bronzing, I am led to form a different opinion; for, as in the example which I now produce, I cannot think I would stop some ten or twelve times before I had laid half-a-sheet of albumenised paper in the nitrate solution—which was not of the strength promulgated by Mr. Stuart, being only some sixty grains to the ounce, and consequently less liable to stain from careless manipulation. The bronzing also is very apparent. My opinion is, that such streaks (at least in this particular case) result from imperfect coagulation of the albumen. Some makers of albumenised paper do not seem to hot-press the sheets after they have been coated, but simply allow them to dry spontaneously, which drying, I contend, is not sufficient to properly coagulate the albumen. This we may reasonably infer from the amount of animal matter which enters into combination with the bath solution, or from the frothiness of the solution when we return it into the funnel for filtration. It seems to me, and perhaps you will find it to be the case on carefully watching the experiment, that after you have lifted your sheet from the bath, after dipping some ten or fifteen sheets, the solution in the bath begins to get a little reddened (which Mr. Stuart does not object to, but of which I cannot say the same, as I believe that reddening proceeds from a slight precipitate of sulphur) as also to get thickened. Now, from whence comes this reddening and thickening, but through the uncoagulated albumen entering into combination with the bath? The bath becoming saturated with it, will no longer take up the loose albumen from the succeeding sheet, but impart to it an albuminate of silver, which, first drying at the point where it is pinned up, goes on drying irregularly, and thickening as it goes down, leaving a residuum at every stage—hence the wave line and the streaking. This fact also applies to the bronzing, as I believe it to proceed from no other cause than a surfeit of albumen, in conjunction with nitrate of silver, or, what is worse, albumen in a slightly putrid state; and the more am I strengthened in my idea when I remember the fact stated by our President in his paper *On the Influence of Heat and Light in Changing the Physical Properties of Bodies.* There he pointed to an important result in regard to albumen used as a varnish in the state it came from the egg as destructive to the material of which the picture was composed: this he concludes, and I think correctly, to be due to the small quantity of phosphorous and sulphur existing in the albumen forming phosphate and sulphuret of the metal, both of which are subject to re-arrangement of the particles under the actinic rays. Now the albuminate of silver being acted on before, the chloride or the rays of light passing through it before arriving at the actual chloride produces, according to my notion, the bronzed appearance. This bronze I have often wished to wipe off that I might get the picture beneath. I do not mean to say that bronzing happens so in every case, but in this particular one it seems certain. The next item touched on was failure as arising from a mealy appearance in the prints. No solution was offered for this unhealthy phase, but it was stated that the mealiness could be observed in the printing-frame before the print was put into the bath. I have a small specimen of this phase of failure, or what I call mealiness; but perhaps it may not coincide with the mealy notions of others. As this same disease caused some keen discussion last evening, perhaps some of our friends present may have other phases of the same failure.

This failure seems to me to arise from the paper which is to be albumenised being of a porous nature, the pores absorbing a greater quantity of the albumen and salting, whilst the more even portions absorb a lesser quantity. On the sheets being subjected to pressure, those pores containing more of the albumen are compressed to a greater extent than the more level portions are, consequently more hardened and horny than the other. The sheet being placed on the silver solution, the softer parts of the albumen absorb a greater quantity of the silver than the horny parts; and if the sheet is quickly snatched from the bath, those more hardened parts not being thoroughly saturated, on being exposed to the light, are not so quickly reduced as the other parts, and here we are enabled to discover the mealiness even in the act of printing. I observe, especially when such prints are placed in the alkaline bath, that those parts which seem to be subjected to most pressure remain brown and horny like, whilst the intermediate spaces become quickly darkened.

With regard to the measles, or those hard gritty specks which mar an otherwise good print, I am not sufficiently familiar with their nature to offer an explanation why they occur; but I have observed that in some sheets of paper where the glaze did not appear so high as on the other parts, or where the paper was more bibulous, these (after the toning, especially in the old hypo. bath) gritty spots appeared in great number. I also believe that the more the salting solution is allowed to saturate the paper the greater the chance of producing this nauseous blemish, which a prolonged immersion in the strongest hypo. does not seem to move. I have not a specimen of this particular phase of failure, but it appears to me to be the formation of some double salt of sulphur in the body of the paper; for, on burning portions of such paper, I find a blue flame rises at the points where the gritty knots are—a crude experiment indicating the presence of sulphur.

Another phase of failure looms forth in the yellowing of the print. Perhaps this is as troublesome a phase as we have to encounter: it seems to be the most familiar in working with albumenised paper, as I have found it commence on immersing the print newly from the printing-frame into a bath of clean water. I have found the same taking place in the *sel d'or* bath, especially if I was pushing the print to a deep black: the whites turn to that annoying jaundice colour; and I have found the same ignoble colour rise in the print, after passing cleanly through the whole washing and toning process, on its immersion in the hypo. bath. Nor is it confined to the albumen paper alone; it peers out often on the plain paper. And even allowing that the print is beautiful from the beginning of the process until the end, having black purple shades, and clear, well-defined lights, is carefully mounted—for a photographer, when he gets a batch of prints through all the circumstances of washing, toning, and dressing, is very mindful of them till the whole operation is finished, which indeed gives him pleasure, as he feels that his labour has been rewarded—how perplexing is the fact that this same disease after a time returns, and that in the space of five or six years we find our darling subjects spoiled by an incurable attack of yellow fever! To the honour of the alkaline bath, be it said, I have found very few failures of this kind, so far as the toning is concerned; but there are difficulties attending the use of this bath also, as one sample of chloride of gold may be stronger than another, which happening often causes us to loose a good print, from a cold, blueish-black tint, or from the possibility of the alkaline dissolving or softening the albumen, raising blisters, at the back of which hyposulphite of silver gets lodged, which in the after-washing is difficult to clear away. Again, there is a series of secondary failures, resulting from the salting bath being stronger than the silver bath, and *vice versâ*, as also dirty spots arising from air bubbles getting between the surface of the solution and prints, or from prints in the toning or fixing baths lying too closely together; but those defects are more readily cured in comparison with those just enumerated.

I have now adverted in a rough way to what I consider some of the chief difficulties we have to encounter in the pursuit of our art, and tried to give an exposition as to the cause of some of them. I may not be correct in my notions in regard to those matters, but I am willing with others to lend my aid, however humble the effort, to have such cleared away. I may not be correct either in my conception of the remarks which came out in papers to which I have referred; but I am very willing, as I have already stated, to be corrected. When any notion of any particular theory seems false to us we should endeavour to eradicate that notion from the minds of others, or, if we are wrong, to have it properly understood by ourselves, thus fulfilling the end of mutual improvement.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The members of this Society held their first meeting for the season at King's College, on Tuesday Evening, the 6th instant,—the Right Hon. Sir Frederick Pollock, the President, in the chair.

The President said he could not help congratulating the members of the Society who had met on the present occasion, that they were at length assembled under the roof of King's College, and that they were there with every prospect of success, and with a very great saving to their funds. They must be well aware of the expense they had been put to in hiring that out-of-the-way place in Leicester Square, which, although taken with every promise of success, had failed to prove attractive. To use the words of Milton—

"Here we may range secure."

He wished to express the great pleasure he had in meeting them, and in looking at the productions of M. Joubert, Herr Pretsch, and Mr. Thomas, which those gentlemen had so kindly presented to the Society. He thought few things were more beautiful. If they had cast their eyes over what was spread on the table, they must have seen there what spoke in far more eloquent language than he could employ—the beautiful photographs which had been presented to them that evening. Some of the specimens would be the subjects of papers to be read to them, and others would be explained by those who had done the Society the favour of introducing them there for the purpose of making them known, and he was sure the Society was under the greatest obligation to those gentlemen.

The following gentlemen were duly elected members of the Society:—John Scott, Esq., Russell Gordon, Esq., and W. Plumtre, Esq.

Dr. Diamond read a paper *On the Apparently Incorrect Perspective of Photographic Pictures Produced by Lenses of Different Focal Lengths, as Usually Viewed or Looked at, which may be Considered as a Kind of Apparent Distortion*, by Mr. J. Rothwell. [See page 327.]

A vote of thanks was given to Mr. J. Rothwell for his paper.

Mr. Shadbolt said he had a few observations to make upon the paper they had just heard, and he was sorry Dr. Diamond had omitted reading the mathematical portion of the paper, as upon that the question raised principally turned. He was glad that Mr. Rothwell had treated the question mathematically, instead of making use of the mere cant terms so frequently employed. He was glad to see in the chair one who was used to weigh words, and to ascertain their true meaning, whether used for the purposes either of explanation or mystification. He, however, did not charge Mr. Rothwell with having endeavoured to mystify the subject, On the contrary, he considered he had treated it in a very lucid manner. It had been said that "nothing was so false as facts, except figures;" but in his opinion it was not the facts or figures that were so often false as the deductions presumed to be based upon them. He found that several of the deductions drawn by Mr. Rothwell were open to controversy, and that there were several charges brought against photographs which were not reasonably founded. He (Mr. Rothwell) pointed out the cause of some kinds of distorted effects in photographs; but he did *not* state what was equally true—that precisely the same faults existed in pictures delineated by the hand of the most skilful artist, if viewed from a distance different from that maintained while producing them. He should endeavour to rescue photographs from some of the charges so made against them in particular, as they are shared in equally by all pictures. The facts detailed by Mr. Rothwell were indisputable; but he did dispute some of that gentleman's deductions. Mr. Rothwell stated that if pictures were taken by a lens of twelve inches focus they would probably appear correct in drawing; but that, if pictures were taken by lenses of shorter focus, they would be incorrect. Now he had said, and truly, that if a picture, taken by a lens with a focal length of twelve inches, were viewed at a distance of twenty-four or sixty inches, it would appear incorrect; and therefore, when he said that a picture, taken by a lens twelve inches in focal length, would appear correct, the assertion was true only if viewed at that distance. He did not acquiesce in the explanation which Mr. Rothwell had attempted to give, relative to the apparent enlargement of near over distant objects. In his (Mr. Shadbolt's) opinion that was owing to the altered *power* of the lens. On bringing an object nearer to the lens than the general area of the picture being delineated, a readjustment of the focus of the lens was necessitated, whereby the power of the lens was interfered with, and the object was delineated comparatively larger than the rest of the subject. Mr. Rothwell had attempted another explanation—the alleged fact that two poles, at a distance of ten and forty yards respectively, did not appear distorted when viewed by the eye, because the eye was naturally adjusted to each when looking at them. The single eye, however, could not be adjusted in a manner to judge of distance, both eyes being required for this purpose. If the two eyes were brought to bear on one object, and then shifted to a more distant one, there was a certain movement in the inclination of the axis of the eyes which by experience enabled the spectator to judge the proportional distance of the object from him. If the eyes were adjusted first upon a distant object and then upon a near one, a convergence of their axis would take place, and a movement would be perceptible, even although the objects were in the same line; but if one

eye were shut, and the two objects were alternately looked at, there would be no movement of the eye perceptible, and both objects would appear equally distinct, provided they were in the same line from the spectator. The size of the object was judged of by that of the angle subtended, together with the distance of the spectator from the object. Thus few people except astronomers were acquainted with the real difference in size between the sun and the moon, because those bodies were placed at such a distance that the convergence of the axis of the eyes in looking at either was as nothing. Even in looking at a familiar object the spectator could not form a correct idea of its size until he had brought both eyes to bear upon it. If he saw a man approaching from a long distance, even with both eyes, he would not be able to say whether he was a short or a tall man until he came near him, because the convergence of the axis of his eyes would be so small that he would be unable to judge of his distance, and hence would not know the value of the subtending angle. Therefore, it seemed to him that the alleged apparent disproportion between the two poles, as seen in the picture, arose simply from the fact that two eyes were used to look at it; and hence the fact was revealed that both images were at the same distance from the observer; but if one eye only were employed at the right spot, all the proper perspective would be restored. He thought artists were instinctively conscious of that fact, for frequently in viewing pictures they made use of a small instrument by which they prevented one eye seeing them at all. Mr. Rothwell again asserted that the near objects of a subject were usually in the margin of the picture. That proposition he denied *in toto*. In taking a landscape it was generally necessary that the lens of the camera should be raised above its normal position, for the purpose of taking in more sky and excluding the useless foreground. That proposition of Mr. Rothwell's therefore fell to the ground.

The next point to which he would draw their attention was the remark Mr. Rothwell had made relative to the distortion in portraits. It appeared to him (Mr. Shadbolt) that Mr. Rothwell was charging to other errors that which was due simply to the bad selection of the point of view. In taking the portrait of a sitter, a point of view should be taken up by which the whole of his person could be included; but if the camera were pushed up to within two or three feet of him, the nearer features would entirely eclipse those which he might call the background features. Thus, if the camera were pushed nearer still, the ears would be entirely hidden by the cheeks. Therefore, when Mr. Rothwell said that a lens of too short a focus produced this kind of distortion, he meant if it were brought too near the object. In the next place Mr. Rothwell spoke of the enlargement of objects out of the focus. To that expression he demurred, as he contended there would be no *material* enlargement, so long as the object were at all defined, but merely a blurring—a thickening of the lines, as if copied on blotting-paper. Mr. Rothwell next proceeded to mention the distortion produced by viewing an object obliquely. "Cocking" the camera was the special point to which he drew attention—that was turning the camera so that it leant upwards to an object. Although he (Mr. Shadbolt) admitted that pictures delineated in that way looked distorted, yet he contended that, if viewed in the proper manner, they were not so in fact. If one stood near a building—Westminster Abbey for instance—and looked up, a certain picture was depicted upon the retina, the nearest equivalent to which would be a plane held up between the eye and the object at right angles to the axis of the eye, and if the picture as seen by the eye were drawn upon it, it would appear distorted if viewed in any other position. Mr. Russell Sedgefield had sent him a stereograph (which he exhibited) that appeared, when viewed in the ordinary way, to have a hideous amount of distortion, but in a paper which Mr. Sedgefield published in The British Journal of Photography some months ago, he pointed out the fact that, if in viewing that picture in the stereoscope the spectator turned it up to the sky as if he were looking up at the building, he would immediately perceive that the distortion disappeared. If there were a stereoscope in the room the members present might perceive that it was exactly like looking at the subject in nature. He had left to the last a remark which really ought to have come first. He found it stated that the paper was by Mr. J. Rothwell, "inventor of the method of constructing photographic lenses free from distortion." He regretted exceedingly that Mr. Rothwell was not present, as he should have been glad to have been informed by him what particular point he claimed as his invention. The only reference to the subject was made at the close of the first portion of the paper, in which he spoke of *his* principle as explained in a paper read before this Society. He did not recollect any principle which had been laid before the Society that could be truly claimed as novel in producing lenses free from distortion. At the time that the paper to which Mr. Rothwell alluded was read, he (Mr. Shadbolt) pointed out the fact that, from the earliest days of photography—apart from daguerreotypes—being first practised in this country, lenses had been constructed upon the same principle as that indicated in the paper. He presumed that Mr. Rothwell claimed the insertion of the diaphragm between the lenses. But he thought he was in a position to prove that that was not invented by Mr. Rothwell, but by a gentleman at Liverpool, who worked with Mr. Robert Hunt in the earlier days of daguerreotype. Moreover, in 1851, he had the pleasure of seeing in Dr. Diamond's possession, or in the possession of a friend of his, one of Archer's arrangements which had that peculiarity.

Dr. Diamond said a friend of his had that lens at the present time.

Mr. Shadbolt continued.—Before the earlier date to which he alluded, he believed double combination lenses were scarcely in use, and in all made by Mr. Archer he did not think that diaphragms were ever placed in any other position. It was well known to every practical optician that when so placed distortion of the marginal lines was avoided. But if Mr. Rothwell claimed to have originated the notion suggested by Mr. Sutton, that it was necessary that the back and front combinations should be identical in form, to prevent distortion, he was ready to dispute it. Before he sat down he could only say that he was obliged to Mr. Rothwell for laying before the Society a lucid explanation of certain facts that most persons had observed, but that few had been able to fix an exact value upon.

The President said he was quite sure that he should be permitted to say that they were very much obliged to Mr. Shadbolt for the information he had given them. He, however, was not quite so certain as Mr. Shadbolt was that the single eye did not alter its focus in viewing objects placed at different distances; for he recollected the exhibitions that used to take place of the phantasmagoria, in which, upon the same plane, the shadow of an object was thrown. The image of it was made to start apparently from a great distance, and to advance until it appeared to be close upon the spectators. That effect was produced not by the motion of the plane upon which the image was formed, but by altering the focus, and, at the same time, to change the position of the instrument used for producing the image, in order to keep the latter distinct; and it was only by this double motion that change of size and distinctness could be given to the image. He did not feel competent to give any definite opinion; but he believed most philosophers considered that the single eye, in looking at a distant object, adapted itself to the distance exactly as a telescope was pulled in or pulled out when used for the purpose of looking at objects at various distances. In the same way, when looking through an opera-glass at a person in the next box, the glass must be differently adapted to what would be required when looking at a person at the further end of the stage. This was perfectly familiar to all who used spectacles; and for his own part, although he could see well enough the paper before him, he could not, without the aid of his concave glasses, recognise a friend at the end of the room. There were persons who were able to adapt one eye so as to see an object at a great distance as well as one near; others had more limited powers of vision, and were able to see near objects, but were unable to see objects at a distance. With all due deference to Mr. Shadbolt, he did not agree with his explanation on this point. He recollected having seen several ingenious specimens of pictures drawn upon a plane in a distorted manner, which, when regarded from a certain point of view, acquired a natural appearance. There was one instance he recollected of a castle and a tree and some other objects being delineated upon a plane in a distorted manner, and if it were looked at from a particular point all the objects appeared to rise up, and the castle and the tree took their proper form. There was another still more extraordinary instance, where a human face was spread out and twisted in a most extravagant manner; but on looking at its reflection in a glass of a certain shape, all deformity vanished, and it became the face of some well-known person. All those instances were well known to those who studied optics. He knew enough of optics to be aware that the image of a straight line became a conic section in certain cases, or a part of a circle, or a part of an ellipse, just the same as the shadow of the top of a lamp if thrown upon a wall sometimes assumed the form of a hyperbola, or that a circle became a porabola under some circumstances. Those distortions were common in all cases where images were formed either by lenses or by reflecting glasses; and probably the best instance of the distortions which arose in photography was the image reflected in the camera-obscura upon a flat and not upon a concave surface. There, as in photography, the centre was perfect, but the surrounding margins were distorted; and in order to make the camera-obscura an instrument of instruction and amusement, the image was received on a concave surface, whereby the edges were rendered distinct, and a decent picture was obtained. He might add, with the greatest deference to the opinion of Mr. Shadbolt, and with many thanks to him, that he had endeavoured to show that some of the observations of Mr. Rothwell might not be so entirely out of place as they might appear to Mr. Shadbolt.

Mr. Davis said he had a few words to say upon the question of the enlargement of the picture towards the margin. Mr. Shadbolt considered there was only a blurring, and that there was no enlargement. He, on the contrary, thought there was an enlargement; for, presuming they had a plane upon which the picture could be delineated, the lateral lines would become an arch, clearly showing that the edges were somewhat enlarged. The second point he would refer to was with regard to the appearance of distortion produced by turning the camera obliquely to an object on bringing it to within a short distance of it. He thought if he got near to an object, according to correct perspective, that the upper part of two lines forming the sides of a high building *ought* to appear to approach each other. If a person measured the apparent width of the base of a tower, and compared it with the apparent width of the top, he would find the top much less than the base. The lines appeared to converge at the top to the eye the same as they did in the photograph.

The President said, in confirmation of what had fallen from Mr. Davis, he must say that it was impossible to doubt that if a spectator stood in the middle of a plane, with four lines rising perpendicularly from the

north, south, east, and west, and were conceived to be of infinite length, they must actually meet in the centre of the heavens over his head. There could be no doubt upon that point to a philosophical mind. At an infinite distance the interval between any two of the lines must be comparatively nothing—the consequence of which was that they must appear to meet.

Mr. Bull said he could not help thinking that Mr. Shadbolt was wrong in saying that the single eye could not appreciate distance, for he could not see the back and front sight of his rifle with one eye at the same time, and to see them distinctly he had to alter the focus of his eye backwards and forwards.

Mr. Shadbolt asked permission to say a word or two in explanation. A slight error had been made in attributing to him the assertion that the single eye made no adjustment when looking at a near after a distant object. What he did say was, that the spectator was not conscious of the adjustment. He admitted that the eye might make an adjustment for focus, but he denied that it made any that would assist in judging of distance. Therefore it was impossible that the single eye could give a true idea of relative distance.

The President said, "Then God help the one-eyed people!"

Mr. Shadbolt said he thought it would be found that all one-eyed people moved their heads from side to side, and thus obtained the value of the subtending angle by displacement of position. A very old illustration of this fact—for it was a fact, capable of proof—was to blindfold one eye of a person, and then to let him try to snuff a candle placed at an uncertain distance before him. Nine times out of ten he failed in doing so, being deprived of the means of judging of the correct distance between himself and the candle. There were two other points to which he wished to call their attention. Sir Frederick had remarked that perpendicular lines drawn from the four quarters of the compass must meet in the heavens. Now that point he disputed.

The President said they must meet if they were visible, and were prolonged indefinitely.

Mr. Shadbolt said there was a proposition in Euclid which was indisputable, namely, that parallel lines, however much prolonged, never could meet.

The President said it was a question of appearing to meet. At an infinite distance one hundred miles would appear as a mere point. Supposing the four poles which were thus to be extended were five hundred miles distant from each other, when they had got to about the distance of the moon from the earth their points would appear to meet, or would be so near together that it would require a very powerful telescope to distinguish them. Mr. Shadbolt was imputing to him that he meant that they met in fact, but what he really did say was that they would appear in perspective to meet.

Mr. Shadbolt said that if the poles were visible at the distance supposed *the space between them, being so much greater, must be even more visible.*

The President said that these purely scientific questions were hardly worth discussion.

Mr. Shadbolt said then he would refer to the remark by Mr. Davis, that when looking at a distant object, it subtended a much smaller angle than when the eye was directed to it when near. He perfectly concurred in that; but Mr. Davis forgot that at the same time the angle would be the same on looking at the plane of delineation, if interposed *parallel to the object delineated*, producing the same effect to the eye as if the object itself were looked at, and the subtending angle would be the same. If the paper of Mr. Rothwell were carefully read, it would be found to prove that proposition distinctly.

Mr. Davis said that it was impossible to place a plane of delineation parallel to the object, unless the plane was equal in size to the object to be delineated.

Mr. Shadbolt said that was an error, as Mr. Davis must perceive on reflection.

Mr. Davis said that it was quite true, as Mr. Shadbolt observed, that parallel lines did not meet, however prolonged; but the sides of a road certainly presented the appearance of converging.

Mr. Malone said there was a photograph of a railway bridge which had been presented to them, wherein the four sides of the entrance occupied the whole of the sheet of paper, whereas the far end was a *small white spot* in the centre—the distant sky being shown clearly through the whole length of the tube. It was there clear that the whole distance, upwards of two miles, was represented by the convergence of the lines towards the centre of the picture. If Mr. Shadbolt were to look at that bridge through a piece of gummed glass, he would perceive the same effect in nature, and he would see that the lines appear to meet to his eye in a small point. Supposing he looked up through a perpendicular tube, instead of through a horizontal one, the apparent convergence would be the same.

Mr. Heath said the other day he was detained at a railway station in the country, and he had an opportunity of noting the effect of the convergence of the rails on a peculiarly straight line. At both ends they appeared to meet. He did not think that what was in nature, and in accordance with natural vision and perspective, ought to be considered distortion in photography.

Mr. Hughes said Mr. Heath had met the real question. It was very strange that they should now have to discuss the first principles of perspective. Things were called distortion in photography which, if severely tested by the rules of perspective, would be found to be correct. In order to correct such apparent distortion, Mr. Rothwell stated that in viewing a picture the eye must be placed at the point at which it was supposed to be when the picture was delineated. Supposing they took a portrait, and, by placing the lens near the sitter, obtained a figure with prodigiously large feet and with a comparatively small head, if they placed the eye in the same position all disproportion disappeared. However, although it might be scientifically correct, the distortion was very offensive. Of course his remarks would not apply where the distortion arose from a defect in the lens itself. The tendency of a short focus lens, when used to cover too large a surface, was to exaggerate the apparent distance between near and distant objects, so that near objects were comparatively larger than the rest of the picture. As a rule, photographers were apt to employ too short focus lenses. They tried to obtain a half-plate picture with a quarter-plate lens, and a whole-plate picture with a half-plate lens; whereas they should do exactly the reverse, and take half-plate pictures with whole-plate lenses, and quarter-plate pictures with half-plate lenses. With regard to one remark made by Mr. Shadbolt, he wished to say that he did not know who had introduced central diaphragms, but he knew that they were used prior to 1850, as he had used one himself originally, and he had an old American journal, dated before that time, in which central diaphragms were mentioned.

Mr. Malone said he thought there must be some misunderstanding on one point, and he thought it only fair to Mr. Shadbolt to ask him whether he disputed the apparent convergence of perpendicular lines. It was so elementary a point, that he was sure he would not dispute it. With respect to another point made by Mr. Hughes, he begged to say that M. Claudet had been for a long time impressing upon his pupils the necessity of using long focus lenses. Although the apparent distortion of the picture might be defended by the rules of geometry, it could not be defended by the rules of that which ought to govern them—the rules of good taste. Mr. Collen had refused to take a loft door some distance above the ground, stating that, as he could not produce a good picture from it, it was better not to take it at all. There was a question he had frequently asked photographers and artists, without obtaining an answer, which was—What description of lens ought to be used, and what distance and angle the lens ought to be placed from the object, to produce a satisfactory result? It appeared to him that they were left entirely to hazard upon those points. Some accord ought to be come to between the rules of perspective and the power of photographic lenses. He had seen a most hideous caricature of the maker of certain lenses, which was exhibited for the purpose of showing how large a picture the lens would take.

Mr. Shadbolt said that he thought nearly every observation upon what he had said had been made under a misconception. The proposition he started with was, that if a picture were required to be delineated correctly, *the plane of delineation* ought to be *parallel* to the object delineated. If he looked up at a tower, its sides would appear to converge; but if his plane of delineation were interposed *parallel to the tower*, the lines drawn from the eye to the marginal lines of the tower would cut the plane of delineation by lines which do *not* converge, but which would be parallel as in the tower itself. He would reply to Mr. Malone's observation relative to the tubular railway bridge, by pointing out that in that case the plane of delineation was at *right angles* to the apparently converging lines, and, therefore, it did not apply to his (Mr. Shadbolt's) remarks; but even in that case, as bearing upon the President's supposition of the four poles meeting overhead, although at a distance of *two miles* the angles did *not appear to meet*, there was still the small white spot, although the lines of the angles themselves had disappeared.

Dr. Diamond then read a letter from Mr. Dallmeyer, enclosing some specimens. He had also to announce communications from Mr. Thomas and Herr Paul Pretsch, explaining some of the specimens on the table.

The President said that he held in his hand a specimen of the actual work of light upon copper. It was not exactly an original invention, but it was a great improvement on the former process, as the picture presented the appearance of having been worked on by an engraver, although Mr. Pretsch gave his word that such was not the fact, but that it was entirely the effect of photography. Thus copies of that picture could be produced in great numbers, at a trifling expense. M. Joubert had produced photographs fixed upon glass, and Mr. Barnes exhibited his enamelled photographs. Mr. Malone also exhibited specimens of pictures printed by electric light. [The various specimens alluded to were handed round to the members.]

Mr. Malone said he was happy to lay before the Society the pictures he had produced by electric light, as it might be of great use under certain circumstances. He had often experienced great difficulty in printing in the winter, and having turned his attention to electric light, he found that he could print from a negative in a quarter of an hour, by simply exposing it to the light produced by carbon points. He found that it answered better than the natural light on a dull day. Thus good effects might be produced at any time of the day or night. He had used one of Duboscq's lamps, belonging to Mr. De la Rue. He thought he had shown that electric light was superior to atmospherically-deteriorated sunlight. It was no doubt expensive, but still, under certain circumstances, people would not mind the extra expense. With respect to M. Niépce de St. Victor's alleged discovery of bottled light, he considered that the effects produced were owing entirely to the vapour of the ink used by the French in printing their newspapers. He had found by experiment that, without

any application of so-called bottled light, a French newspaper would leave its print on sensitised paper, whereas the heading of *The Times* made no impression at all. He had not exposed the paper to the light at all, the whole operation having been performed in the dark. He had thus deprived M. Niepce de St. Victor of the power of bringing against him the same charge he had against Mr. Busk, namely, that he had exposed the engravings to the light previously to commencing the experiment. He thought the effect was caused by the vapour of the printing ink suspending the action of the chloride of silver.

A Member asked whether a negative or a positive had been obtained.

Mr. Malone said he at first thought he had obtained a positive, but he subsequently found that that appearance was caused by the transparency of the paper, and that in reality it was a negative. On the back, however, was a very distinct positive.

A vote of thanks to Mr. Malone was then passed.

Mr. Heath said he knew the trouble and expense of Duboscq's lamp, and he should be sorry that it should go forth that it could be cheaply and usefully applied for photographic printing.

Mr. Malone said he had mentioned the expense. The light cost about 10s. 6d. for half an hour. But still good effects were produced by it, which, under certain circumstances, would entirely counterbalance the expense.

The President said he had to present to the Society, as coming from Mr. Silmer, a beautiful specimen of the application of photography to the reproduction of old manuscripts.

Votes of thanks were then passed to Messrs. Dallmeyer, Joubert, and Pretsch, for their specimens and papers.

The President announced that the next meeting of the London Photographic Society would take place on the first Tuesday in December.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Society was held on Wednesday evening, the 31st ult., at Myddleton Hall, Islington,—George Shadbolt, Esq., V.P., in the chair.

Mr. John Barnett, Hon. Sec., having read the minutes of the last meeting, which were confirmed, the ballot for new members took place, when Mr. George White was declared duly elected a member of the Society.

Mr. D. W. Hill, Hon. Treasurer, read a paper, entitled *A Photographer's Holiday in Derbyshire.* He also exhibited a number of fine stereographs of Derbyshire scenery. [We are at the last moment obliged to withdraw Mr. Hill's interesting paper. It will appear on Dec. 1st.]

The thanks of the meeting were tendered to Mr. Hill for his paper.

The Chairman said there was then a nice little opening for a discussion upon dark tents and boxes; and if any one had visited the places described by Mr. Hill, there might also be a useful discussion got up upon the best points of view from which to take the photographs. He had had an opportunity of inspecting those exhibited by Mr. Hill, and he had been particularly struck by one of them—the *Stone Staircase leading to Haddon Hall*—which was one of the best of that place he had ever seen. It came out beautifully in the stereoscope. There must have been some difficulty in getting the avenue of yew trees so successfully.

Mr. Hill observed that he had been to Wingfield Manor, which appeared to him to be a very beautiful spot, and which would have been fifty times more beautiful if the hill had not been completely obscured by the rain and mist.

The Chairman: There is one point which I think might be advantageously considered, namely, whether it is desirable to make use of the dark box partially as a camera, or to have a dark tent and to use the camera separately. It has been thought by some that the internal space of the camera might be used for the purpose of manipulating plates in; but they had forgotten one material point, which was, that it very rarely happened that the camera was dropped down at once on the exact spot from which the photograph was eventually taken; and if the camera and tent were together, a large amount of material would have to be shifted about.

Mr. Hill said if his camera and tent had not been separate he could not have worked, in consequence of the heat of the sun. He could assure them it was no joke working in a small box during hot weather.

The Chairman asked whether Mr. Dawson had had any experience in the use of dark tents out of doors.

Mr. G. Dawson replied that he had made some little use of it. About five years ago he had some experience with one of Archer's cameras, which they had doubtless seen. He, however, never could see comfortably the progress of the development through the yellow glass. On one point he had come to a decided opinion—namely, that the larger the tent the better it was. The best he had seen was Smartt's, which was larger than Archer's, and was easily carried. In that he performed operations easily that were almost impossible in a small one; as, when working in the latter, it was absolutely necessary to go out for air after a short time. If uniformly good results were desired, it was necessary to have a large tent, which, however, did not at all mean a heavy one. Some tents were made to carry a number of heavy bottles, which was quite unnecessary, as it was not requisite to wash the plates at the time; for, if a strong solution of hyposulphite was poured on, it would do all that was wanted at the time. Some beautiful results had been obtained by Mr. Ross, of Edinburgh. He operated in a tent about three feet high—at least, he had a little hunch-backed boy who crawled in and developed the plates. He himself preferred to keep outside; but he said he should certainly have a large tent—one that a man could breathe in—one that three or four persons could stand in in case of a shower of rain. He had been able to take a picture sometimes in five minutes after commencing to set up his tent. Most people objected to large tents; but he preferred them, especially in cold weather, as the collodion then worked better in a large tent than in a small one.

Mr. Hill said that with Rouch's box the operator escaped the vapour of the chemicals; and this, in his opinion, was a great advantage, especially to persons in ill-health.

The Chairman handed round several stereographs of the scenery around Beddgelert, North Wales, from collodio-albumen negatives, taken by Mr. Morris Beck.

Mr. Maltwood then exhibited a portable operating-box of novel construction, weighing from eighteen to twenty pounds. The box itself forms the stand for the camera, which, by an ingenious arrangement, can be made to slide from side to side, and to revolve without being unfixed from its stand, the base of which is much more extended than that of the ordinary tripod-stand, and supports the box with great steadiness. Attached to the box is a portable flexible cistern, which holds sufficient water for several hours' work. The bath is placed in a corner, so that no mistake can be made. From the manner in which it folds, and the arrangement of the straps, any objection against it on the score of weight is removed, and it can easily be carried for miles.

The Chairman then called the attention of the members to the large composition photograph on the table, called *The Holiday in the Wood*, by Mr. Henry P. Robinson, of Leamington, which he (the Chairman) had the pleasure of exhibiting.

Mr. Simpson exhibited some of Mr. Skaife's chromo-crystal photographs for bracelets, brooches, &c.

The Chairman said Mr. Skaife prided himself upon being able to take those pictures with his pistolgraph without the knowledge or consent of the involuntary and unconscious sitter.

Mr. Simpson having stated that Mr. Skaife had promised to attend their next meeting to produce and explain his pistol camera, then proceeded to exhibit and explain Meagher's improved portable camera.

Mr. Hill said he was sorry Mr. Morley was not present, as he had invented a portable mount for the lens, whereby all screwing was avoided.

Mr. Simpson observed that the mount consisted of a cell into which lenses of various focal lengths could be dropped. The brass mount was always kept on the camera ready for use, and the necessity for a rack and pinion dispensed with, as all the focussing was done from the back of the camera.

Mr. Hughes asked how the hood was provided for?

Mr. Simpson said there was no hood at all. It had brass stops, and the lens was chiefly inside the camera. Mr. Morley would shortly show them his invention.

Mr. Hughes remarked that some person—he did not know who it was—had taken out a patent for a new mode of mounting lenses. He did not know that it was in the market, as he had not seen it for sale. The mounting was for a single lens, and its peculiarity consisted in its being a series of rings put together on the principle of a telescope—in fact, on much the same principle as the bellows body of Mr. Meagher's camera. He thought at first that that invention was the same as Mr. Morley's.

The Chairman having been requested to ask Mr. Morris Beck to give them some account of his proceedings in taking the Welsh views,

Mr. Morris Beck said there was nothing new in the way he had proceeded. The pictures were taken by the old collodion process with Keene's collodion. Until this year Keene's collodion had never failed him, but it had done so this year in some instances, as he found that the two edges where the collodion was poured off had peeled.

Mr. Shave observed that he had found the same fault with Keene's collodion when using it in the Fothergill process, and he thought it was occasioned by its being thicker than ordinary.

Mr. Beck said that in some instances when the plate was drying after the second washing, the collodion had completely peeled off. He covered some of the plates with albumen, and the edges where the peeling commenced with albumen or copal varnish, both of which answered the purpose. So far as stains went, he did not think he had a single stain in any plate which he could attribute to the process. The great difficulty, so far as he could make out was, that the lights were apt to be too light—of a snowy whiteness—if the development were carried sufficiently far so as to get a strong negative.

Mr. Hughes said they had an element in the dry process which they had not in the wet—which was albumen; and, if sufficient care was not taken, they would most assuredly have their lights too hard. Any person who had seen the dry process must have been struck with the fact that a very thin negative would produce a very brilliant picture. The fact was that nearly every person who adopted the dry process went in for quickness, and the consequence was that their deep shadows were not well done. With the collodio-albumen process it was a good plan to expose for the shadows and leave the lights to take care of themselves, as it was almost impossible to over-expose with this process. He should like to know if any one had tried the effect of various proportions of water with the albumen.

The CHAIRMAN said he had tried every possible quantity between one thirty-second part and pure albumen, and the result in his mind was that, provided there was sufficient albumen to combine with all the free nitrate of silver which was left upon the plate, the result would be satisfactory. Mr. Hughes's observations really were to the effect that where albumen was used a much less intense-looking plate was obtained, and was necessary, than where collodion alone was used.

A vote of thanks was unanimously accorded to the exhibitors.

Mr. SIMPSON then exhibited some photo-lithographs.

Mr. HILL exhibited a positive on arrowroot paper, which, although rather cold in tone, was otherwise very satisfactory.

After the usual vote of thanks to the chairman, the meeting separated

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of the above Society was held in the rooms of the Literary and Philosophical Society, 36, George Street, on Wednesday, the 7th instant,—Professor Williamson in the chair.

Mr. Henry Miller, Mr. Richard Guest, Mr. George Nelson, jun., and Mr. Rogerson, were unanimously elected members of the Society.

Mr. Sidebotham presented two beautiful prints to the Society from negatives, fifteen by twelve, taken by the collodio-albumen process; and Mr. Wardley a print from his admired negative, *Manchester from Victoria Bridge.*

Mr. NEVILL laid upon the table several pictures presented to the Society by Mr. Dallmeyer, and read the following explanatory letter :—

19, Bloomsbury Street, W.C., 5th November, 1860.

SIR,—It may, perhaps, be of some interest to the members of your Society, to inspect a few of the prints taken with my new "Triple Achromatic Lens," more especially since one of your townsmen, Mr. J. Rothwell, was the first who drew my attention to the subject of "distortion," as produced by the various forms of lenses hitherto employed for the photographic art, namely, the ordinary single combination view lens, and that of later-date invented by Professor Petzval, and sold under the names of Orthographic, Orthoscopic, &c., Lenses. The character of distortion, as appertaining to each group, is now well known to every lover of the art.

My portrait combination, in which I at first introduced the principle of freedom from distortion, has been received with favour by the public at large, and is extensively used for views up to pictures 10 by 8; but when required for larger sized plates it necessarily becomes expensive, on account of the large diameter of glasses involved in its manufacture, hence I was requested on all sides to construct a lens "free from distortion," more especially designed for views and copying, for larger sized plates.

After a series of protracted investigations, experiments, &c., extending over several months past, I have arrived at a form of lens which produced the results submitted to you this evening; and I will now state a few of the particulars respecting the instrument with which the pictures were taken. It has a focal length of about 18 inches, and consists, as its name implies, of three achromatic combinations. The front and back are "positive,"—the former $2\frac{3}{8}$in., the latter $3\frac{1}{4}$ in. diameter; between the two is situated an achromatic "negative" combination of $1\frac{1}{2}$ in. diameter. Each of the three has its contact surfaces cemented with Canada balsam, and the total number of "reflecting" surfaces, therefore, does not exceed those of the portrait lens. The negative combination is of such form and focal power as is required for the correction of both the central and eccentrical pencils, and with full aperture the lens is free from spherical and chromatic aberrations, both at the centre and margin of the picture, and the field is flat.

With the whole aperture ($1\frac{1}{2}$ in., or rather $1\frac{3}{4}$ in., for the pencils of rays are convergent upon the negative combination) the lens covers a plate 10 by 8 equally illuminated to the corners, and with this aperture the portrait of "Rifleman" was taken.

With 1 in. aperture the lens covers a plate 12 by 12 to the corners, and with this the views of "Interiors" of Winchester Cathedral were taken.

The maps were copied with $\frac{1}{2}$ in. stop; they are a little less than twice the originals. The negatives from which the prints were taken exhibit much more detail, but I was afraid to trust them into the hands of railway porters.

The view on plate 15 by 12 was taken with $\frac{5}{8}$ in. aperture. The lens and camera were very much tilted.

When the negative combination is removed, the focal length of the lens is reduced to about 8 in., and will take portraits in the same time as the ordinary half-plate lens: the chemical and visual foci coincide, but the field is not so flat as that of my portrait lens.

It is needless for me to offer any remarks in regard to the performance of the lens, since the results speak for themselves; and if they should be approved of by the members of your Society, and establish the fact that photographers can now possess themselves of an instrument which reproduces the objects of nature and art with perfect truthfulness, and is otherwise generally useful, I shall consider my time and labour well spent.

The pictures were taken by Mr. Downes, of the firm of Cundall and Downes, who kindly devoted some time to the testing of my lens.—I am, sir, yours, &c.,

J. H. DALLMEYER.

Mr. WARDLEY: I have anxiously looked for some time for such an improvement as Mr. Dallmeyer's lens appears to afford. This picture of the *Interior of Winchester Cathedral* is a severe test, and the lines of the columns are, I perceive, absolutely straight. They are slightly convergent, and that is all. In this picture of the cross that fault is seen to a greater extent; but it is evident that the camera, as Mr. Dallmeyer states, must have been much tilted, and with other lenses the lines would have been distorted to a far greater extent. In the copy of the map the lines are absolutely square and straight.

Mr. HOOPER: Many lenses which give bad results as regards the straightness of the lines may be improved by shortening the distance between the stop and the lens. I have found that Grubb's lenses are comparatively free from distortion.

Mr. WARDLEY: That does not agree with my experience. I have found them defective in that respect. In reference to the situation of the stop, you may cure distortion by bringing it near; but then you partially destroy the definition.

Mr. PYNE: It does not appear from Mr. Dallmeyer's letter that Mr. Rothwell was the *designer* of this arrangement, but that he had only suggested that something should be done to cure the distortion so common to lenses. I may, I believe, state confidently that Mr. Rothwell originally supplied the diagrams for the combination.

Mr. NEVILL: That is, I think, unintentional on Mr. Dallmeyer's part; for here is a printed paper on the subject, which was read last June before the members of the London Society, in which Mr. Dallmeyer says:—"To Mr. Rothwell belongs the credit of first suggesting the remedy, and to Mr. Sutton of bringing it before the public." I think that should satisfy the objection.

Mr. HOOPER: The time occupied in taking these pictures is not mentioned, and we cannot, therefore, judge of the quickness of the lens.

Mr. WARDLEY: I do not consider that important. The first thing to be considered is good results.

A vote of thanks was then passed to Mr. Dallmeyer.

The CHAIRMAN: I think that all particulars connected with the production of these pictures, and of all others presented to the Society's portfolio, should be written upon them. It is impossible to imagine the interest that may attend such information at a future period: whether the prints may last for one hundred years or for twenty years, changes may have taken place in the art which will render its history incomplete, unless the photographers of that day are able to avail themselves of such information as that which I now propose you should secure for their use; and I would, therefore, impress it upon you to make it a rule that no opportunity should be lost of storing up materials for those who may see photography in a very different position.

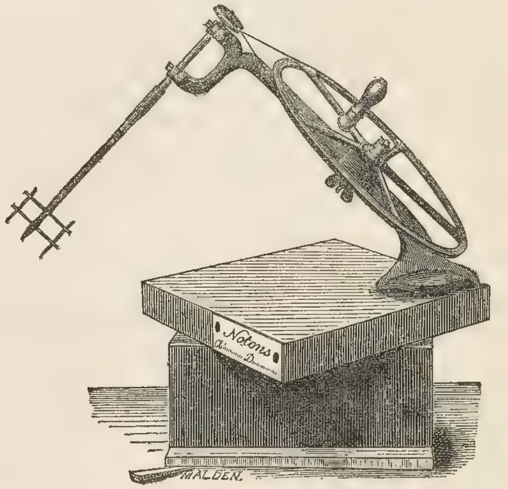
Mr. MABLEY: I have been requested by Mr. Petschler, whose modesty is only exceeded by his ingenuity in photography, to lay before you the results of some experiments he has lately made. These results, as you will see, are very imperfect; but I have advised him to secure the assistance of his brother members by at once making the thing known. I think that the aim being so great, it deserves investigation. Here are some negatives, the plates of which were prepared as for collodio-albumen, the whole of the free nitrate of silver from the last silver bath having been decomposed by a chloride. Upon one-half of this plate was poured a weak solution of chloride of gold, and the exposure in the camera (for twenty seconds) took place about three hours afterwards, with a stereo lens, one-quarter inch aperture. You will perceive that on the half treated with gold there is a picture of full exposure; on the other half not a trace of development. The picture is certainly very foggy, but there it is, and if some means be found of preventing the fog, we have perhaps the key to a quick dry process; but the question at present certainly appears to be full of difficulty.

After some remarks by Mr. HOOPER and Mr. MABLEY respecting the cause of fogging,

Mr. WARDLEY asked Mr. Petschler what prompted him to make the experiment?

Mr. PETSCHLER: I was printing on a dull day, and tried to finish the printing by development. Upon one of the pieces of paper some solution of gold had been splashed, and on those parts the picture started out with great rapidity when treated with gallic acid, while the lights remained pure.

Mr. NOTON and Mr. HEYWOOD exhibited machines for beating up albumen—that of the former gentleman being his own invention, and the first apparatus made known, we believe, for the purpose. Mr. Heywood's was purchased. The distinguishing feature of these machines is simply this:—In Mr. Noton's "albumen disentegrator," as that gentleman styles his apparatus, of which we give the annexed diagram, an



open work beater is caused to revolve rapidly by means of two pulleys, the one of much larger diameter than the other; in Mr. Heywood's there is a compound beater, the one revolving within the other, and in an opposite direction. This is accomplished by a face-toothed wheel which drives two pinions from opposite sides of the centre of motion. The albumen of six

eggs was measured to each competitor, and a performance began which at any rate gave rise to considerable amusement. Mr. Noton was satisfied with the operation in five minutes; but Mr. Heywood, in a minute less, produced a result which was pronounced fully equal to that of his rival. It was remarked, however, that, if the albumen were sufficiently beaten up, Mr. Heywood appeared to be sufficiently used up; and as no one could discover any material difference in the result, the saving of time and the relative prices of the machines were the only considerations; the former of these was too trifling to carry much weight, especially as it was only to be gained by a considerable excess of physical labour. Mr. Noton's apparatus is much more costly; but it must be stated that it has the advantage of greater simplicity, and that its higher price is mainly due to superior workmanship.

Mr. Pegg exhibited six negatives, taken on plates prepared by coagulating the albumen in hot water, according to Mr. Parry's process. One of these negatives was weaker at one side than at the other, by reason, apparently, of the albumen having been driven towards one end. With that exception, especially considering the dull weather, they were all that could be desired—remarkable indeed for softness and half-tone. The exposure this month, after three o'clock, with a quarter-inch stop and stereo. lens, was from twelve to fifteen minutes.

Mr. Mabley: The pictures have now been delivered to the members of the Exchange Club. Before we break up for this evening, I have a suggestion to make in reference to future proceedings in that direction. According to the plan which we have just carried out, nearly another year must pass before we could effect a second distribution; and I therefore propose another plan, the basis of which should be, that a portfolio be kept for the reception of pictures which may at any time be exchanged by members of the Society. Not only would this provide for a perpetual exchange, but it would obviate many difficulties to which the scheme we adopted has been found liable.

Several members having expressed a desire that this principle should be properly considered, the following gentlemen were appointed to report thereon:—Mr. Mabley, Mr. Mann, Mr. Sidebotham, and Mr. Wardley.

A vote of thanks having then been passed to the Chairman, the meeting was adjourned.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The second monthly meeting of the above Society was held in the Religious Institution Rooms, on Thursday, the 1st instant,—J. Kibble, Esq., the President, in the chair.

Mr. Ewing read a paper—*Remarks on Failures in the Albumenising, Printing, and Toning of Positives on Paper*, illustrated by several prints showing failures commented on. [See page 331].

On concluding the reading of the paper Mr. Ewing sat down amidst much applause.

A conversational discussion ensued.

The Chairman remarked that the cause of the measly appearance in prints was the use of too weak hyposulphite, causing the formation of sulphuret of silver; that the brown spots were sulphuret of silver, and that no amount of after-washing or immersion in hypo. would dissolve them.

Mr. M'Farlane exhibited prints having the two kinds of disease which were designated measles; the numerous small red spots on the surface, and which all now agreed was on the albumen; and the brown spots or patches best seen by transmitted light, and which he thought were caused by too weak hypo., as explained by the Chairman.

The Chairman showed some small pieces of paper which had become spotted by being kept in a damp place. A small piece of the paper on which he printed his forty-inch pictures showed these numerous transparent spots very evidently.

Mr. Hugh Wilson directed the attention of the meeting to the getting of what the engraver would call a metallic surface on the paper before printing on it.

Mr. Stuart explained that he had recommended that in his paper read at last meeting.

Mr. Wilson said he proposed it at a former meeting.

Mr. Ewing said he believed neither of them were the original proposers of this simple matter.

Mr. Stuart showed a print produced on the paper enclosed in the preservative case at last meeting; but, having been two days in printing, it could scarcely be considered a fair example of what the case would do.

The subject of printing was again to be continued at the next meeting; Mr. A. M'Nab to lead off.

The Chairman then read a paper on some experiments he had made in reference to Messrs. Petschler and Mann's process, and showed the various pictures referred to in his paper. [See page 326.] He concluded by proposing that the thanks of the Society be awarded to Messrs. Petschler and Mann for the unreserved manner in which they had given their discovery to the world.

The Secretary then intimated that he had been deterred by some business requirements from referring at last meeting to his safe return from the Holy Land, but he would then take the opportunity of proposing that the thanks of the Society be given to Mr. J. Spencer, jun., for his faithful discharge of the duties of secretary during Mr. Cramb's absence.

The thanks of the meeting were then given to Mr. Kibble and to Mr. Ewing for their papers.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The Fourth Annual General Meeting was held on Tuesday evening October 30,—Mr. W. B. Osborn, vice-chairman, in the chair.

The Treasurer, in the absence of the Secretary, having read the notice calling the meeting, a letter of apology for non-attendance from Mr. C. L. Haines, V.P., and the minutes of the previous meeting, which were confirmed, then read the Report of the Council, which stated that, although the Society was in a prosperous and satisfactory state as regarded its financial position—the Treasurer's statement of accounts showing a balance in hand of £14 14s. 11d.—still the Council could not but regard with regret the apathy and indifference evidenced by the members in their attendance at the meetings of the Society, and which had been so long continued, in spite of the exertions of the Council to provide subjects of sufficient interest to induce the members to attend, and to the so great discouragement of the Council, that several of the officers had intimated their intention of resigning their offices and membership at the close of the session just concluded. During the past session one presentation of photographs had been made among the members, and papers upon the following subjects had been read:—*Hints connected with the Dry Process*, by Geo. Shadbolt, Esq.; *The Serio-Comic Aspect of Photography*, by Mr. W. B. Osborn, V.P.; *The Fothergill Dry Collodion Process*, by Mr. Alfred Keene, of Leamington; and one very interesting evening had been spent in a discussion upon the relative merits of the "Wet" *versus* "Dry" processes, on which occasion a large number of magnificent photographs were exhibited, as specimens of the productions of each. During the past session five new members have been elected, and eight tendered their resignations,—the number at present on the books of the Society being *thirty*.

The report of the Treasurer showed that a balance remained in his hands of £14 14s. 11d.

The following list of officers, proposed by the Council for the ensuing year, having been ballotted for, were duly elected:—*President:* The Right Hon. Lord Calthorpe; *Vice-Presidents:* Mr. W. B. Osborn and Mr. C. L. Haines; *Treasurer:* Mr. Jno. Thos. Brown, Jun.; *Secretary:* Mr. Jno. Thos. Brown, Jun., *pro tem.*; *Council:* Dr. Hill Norris, Mr. Rejlander (Wolverhampton), Mr. Hart, Mr. Morris, Mr. Robinson (Leamington), Mr. J. Turner, Mr. Hunt, Mr. H. H. Plante.

On the motion of Mr. Jno. Thos. Brown, Junr., seconded by Mr. Rejlander, it was unanimously resolved,—That Rule 6 be altered as follows:—"The Council to have the power of electing Honorary Members."

Mr. Rejlander having laid upon the table, for the inspection of the members, a portfolio of his inimitable pictures, "Studies from Life," and Dr. Hill Norris a series of very beautiful specimen prints from his new extra sensitive dry plates, together with the negatives from which they were produced, a vote of thanks was given to those gentlemen.

An interesting discussion on Dr. Norris's prints and negatives is anticipated at the next meeting.

During the evening Mr. Rejlander promised a paper for the forthcoming meeting of the Society *On the Camera of Horrors*. It is hoped that the photographers of the neighbourhood generally will muster largely on the occasion.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

[Owing to the great pressure on our space for this number, we are compelled to postpone the continuation of Mr. Wall's valuable "Instructions" till our next publication.]

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

Notice.—I am compelled, by the increased number of correspondents who have forwarded stamped envelopes for private replies, to state that my many duties (willing as I am to oblige, and anxious as I am to please where I can) quite prevent the sending of such to any but personal acquaintances or friends. Besides this, the publication of replies in many cases kill several birds with one stone; as the information "J." wants may be exactly that which "K.," "L.," "M.," and the rest of the alphabet, thought of, or were about writing to me for. Letters I now have shall be replied to on the first leisure evening I have, but for the future I hope not to receive such requests.

Rosabelle.—See an advertisement in the present number (to which also I should be glad to direct the attention of several other pupils who made similar inquiries some time since). The picture did not reach me.

L. Goodwin.—Such a vehicle may be made as follows:—Take gum anime half-an-ounce, with one ounce of gum sandarach; reduce to a fine powder and dissolve them in spirits of wine; place the solution in the sun until the gums are perfectly dissolved, and then filter into bottle for use. This is very useful for glazings.

L. M. and G. R. are referred to portions of these articles now published. The repetition of information already given would, justly enough, displease regular readers and subscribers.

Foreign Correspondence.

Paris, November 10, 1860.

DECIDEDLY our laborious tribe of photographers are almost exclusively occupied at present by two questions—the amplification of pictures, and the carbon-positive printing. The opening meeting of the French Society of Photography was nearly wholly taken up with communications on these two subjects. Among the general public also, nothing has been talked of for some time past but the full-length, natural-sized portrait of the Emperor, executed by M.M. Mayer, Brothers, and Pierson, and exhibited every evening at their door on the Boulevard des Capucines, with an ample accompaniment of gaslight. Those who know Paris and the Parisians, will easily conceive how this curiosity is looked upon as an event. "Have you seen the Emperor's portrait, by Mayer?" "No." "Well, you must see that—a photograph of natural size." "Indeed!" "And perfectly executed; go and see it this evening." "I will, certainly." And so people go there and keep up a constant crowd before the portrait. There are only a few among the spectators who can account for the manner in which the gigantic picture was obtained.

Before the exhibition of the Emperor's portrait, the pony of M. Edward Delessert drew the strollers toward the windows of one of our publishers, where it was on view. A pony of natural size—a picture six feet by five feet! Count Aguado, who, the other evening, presented to the Society a series of groups of animals—likewise amplified with the apparatus of Woodward, but in more limited proportions—had to do with a less easily-satisfied and more competent public, which did not prevent his beautiful picture from being greatly admired. I have seen them, and that by Mayer and Co., and I can assure you that they are all extremely remarkable. But now there comes a new process and a new apparatus to surprise us, and to fix the attention of connoisseurs. A few weeks ago, a M. Wothly, of Aix-le-Chapelle, forwarded to the Academy several portraits photographed at two-thirds of the natural size. In the note accompanying them he says:—"I have arrived at unhoped-for results by a combination of means which constitutes almost a new art. An optical arrangement, analagous to that of the heliostat, gives me a pencil of rigorously parallel rays, which passes through the negative obtained upon the collodionised half-plate, carries with it the image, becomes positive, and spreads out in an immense cone of divergent rays, which fix the picture upon a sheet of sensitised mechanical paper. The intensity of the rays is sufficient to produce the positive in from fifteen to twenty minutes when the operation takes place in the open air. The regularity of their distribution and direction is such that the impression is as clear at the extreme edges as it is in the centre, even when the picture is eight feet six inches in height, and five feet in width. To bring down the duration of the printing to so short a time, I have had recourse to new combinations of sensitising agents. For the operations of washing, toning, and fixing upon such unwieldy sheets, manipulations as rapid as they are efficacious have taken the place of the impracticable dishes. My half-sized and full-sized portraits have, it seems to me, a character of their own; having a greater attraction for the eye, and charming it more agreeably. The harmony and the blending of the tints are such, that these portraits remind one, more than do the ordinary photographs, of the pencil-work of some talented draughtsman. I may say that they are scarcely affected by the influence of the light, as my fixing process renders them proof against all sulphuration."

Two or three days after this communication, it was learnt that Disdéri had just purchased from the author the secret of his invention, and the right to work it in France, at the price of 20,000 francs. I have seen the specimens of this new process at Disdéri's, and I must say that they are strikingly beautiful. The advantage of M. Wothy's discovery is said to be specially in the preparation of the paper. I can readily believe it; for it would be difficult to find pictures superior to these in clearness, in modelling, and in harmony of tone. In all points they are complete. As to the apparatus which produces them, I know nothing more than what is said by the author in his note.

Will M. Quinet have this apparatus and the specimens seized, as he did those of Bertsch and of Woodward? Up to the present time I have heard nothing said on the subject; but, at the opening of the meeting of the French Society, I witnessed a scene which will give you an idea of the unpleasant position in which the said M. Quinet has placed himself with respect to photographers. Without being a member of the Society, and without having received an invitation, he went to the meeting, at which were to be present most of those whose labours he had interrupted, or whose works he had confiscated. Great was the general surprise at his appearance. In spite of the representations of the Secretary, who had taken him into his cabinet, he persisted in staying. He was then requested aloud to retire, which at last he did, though not without attempting to discuss the vigorous measure which he had so unfortunately provoked.

Two communications relating to carbon-positive printing were made at this meeting. The first was from M. Poitevin. His process is based on the property possessed by a mixture of perchloride of iron and tartaric acid of absorbing the ambient humidity of the atmosphere when exposed to the light. If, then, a negative be placed upon a layer of this mixture, the parts upon which the luminous rays have acted will alone absorb this humidity: the other portions will remain inert. The author operates upon glass, porcelain, ivory, and paper: in this last case he transfers. The following are the three examples which he gives in his communication:—

To operate upon ground glass: clean well, and pour upon the glass a mixture of 10 grammes of perchloride of iron, and 4 grammes of tartaric acid dissolved in 100 grammes of water, and then let it dry. If it is polished transparent glass, we first cover it with collodion; and while the layer is still wet, we pour upon it the above mixture, which we then let dry. In both cases, when the surface is completely dry, we expose it for five or ten minutes under a *cliché* in the sun. On leaving the frame, the picture is not very visible, but the parts acted on absorb the humidity of the air, and can retain the colouring powders laid upon them with a pencil. If it is a transparency that we wish to obtain, we wash with alcoholised water, acidulated with chlorhydric acid; we dry and then varnish. To obtain a picture upon glass, we use an enamel or metallic oxide as a colouring matter, with a flux, and we pass it on to the fire. Lastly, to transfer to paper, as soon as the carbon design has been obtained, we cover it with normal collodion. We wet this layer abundantly, then wash it, first with acidulated water, then with common water; after which we lay upon it a sheet of gelatine paper, and let dry. In taking away this sheet, we also take away the collodion upon which the carbon design has become fixed. We varnish, and then fasten the picture upon cardboard.

Such is the method. It is certainly very ingenious; but it has not yet sufficiently answered in practice. If we may judge from specimens sent to the Society, and which were obtained directly upon paper, M. Fargier's method is much more applicable. Unfortunately M. Fargier keeps the secret for himself.

The presentation of two portable operating-rooms, one by M. Bertsch, and the other by M. Titus Albitès, which latter I have already described to you, completed the proceedings of this meeting, in the course of which M. Girard had also presented some pictures of the eclipse, obtained by him at Batna, in Algeria.

ERNEST LACAN.

TO SUBSCRIBERS AND AGENTS.

☞ **Should any of the Subscribers or Agents to this JOURNAL require additional Copies of the present Number, they should address the Publisher on the subject not later than the 20th instant.**

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

ATTACHING THE FILM, &c.

To the EDITOR.

SIR,—From remarks recently made in THE BRITISH JOURNAL OF PHOTOGRAPHY, it seems that the adhesion of the film to the glass is still a desideratum. If so, I trouble you to say that I have for some time albumenised the edge of the plate with a camel-hair pencil, to the extent of about one eighth of an inch; when dry, collodionise, &c., and it will bear any amount of washing the collodion itself will support.

I have thought that, were the proof immersed in gelatine, no evil would result from the use of even common paste; and I believe the paper would be also fit for colouring. I may be in error: if so, will you kindly tell me?—I am, yours, &c., T. L. MERRITT.

November 20, 1860.

[We are glad to greet an old correspondent again. Is the albumen on the edge of the plate only less trouble than having it all over? We scarcely think so. Without doubt, immersion of the proof in *pure* gelatine might afford some protection; but what are we to regard as *common*

paste? that which we make of flour and water only, or that which we buy? If the latter, we do not know what injurious matter it may contain. We recommend you to read the close of a paper by Mr. Stuart in our last number, pp. 314 and 315.—Ed.]

AUTOMATIC WASHING TRAY.

To the Editor.

Sir,—Your correspondent, "Mr. W. Church," seems to be in error as to the action of a syphon, such as described by "H." Directly the level of the water in the washing apparatus falls below the end of the short leg of the syphon the air rushes in and entirely empties it, so that the water will not begin to run off again until it reaches above the level of the bend, when, owing to the great excess of exit area over that of the ingress, the trough will be speedily emptied; and this alternate action will proceed for any length of time (until the supply of water ceases) without any attention whatever.—I am, yours, &c.,

November 5th, 1860. AMATEUR MECHANIC.

[It is our present correspondent who is in error. Mr. Church was quite right in objecting that the great excess of exit area over that of ingress would prevent the water from filling the orifice of the exit pipe above the level of the bend, and, consequently, prevent the syphon being brought into play *as a syphon*.—Ed.]

A FEW WORDS IN REPLY.

To the Editor.

Sir,—On perusing an article in the last number of the Journal, intituled, "Photographic Comments, No. 14," by T. F. Hardwich, I feel tempted to ask your permission to make a few remarks upon it.

In the article in question, Mr. Hardwich takes me seriously to task on account of some observations I made in an address to the members of the Chorlton Photographic Society, in September last, *On the Present unsatisfactory state of our Knowledge of Photographic Chemistry.*

I have just refreshed my memory, by a reference to the report as it appears in your Journal of the 1st October, and I must confess my inability to discover anything in it to give rise to the views advocated in these comments; for I cannot suppose it to be because I call in question the *absolute* perfection of the formula recently given by him for the production of a "definite gun-cotton, well suited in *every* respect for making collodion."

I did not arrive at that conclusion after a slight and superficial acquaintance with the subject, nor without having ascertained what were the opinions generally of others more practically acquainted with its results.

In making that statement I had not the most remote intention to detract from or undervalue the importance of the researches of Mr. Hardwich, but rather to point to them as worthy examples of what had already been accomplished by diligent and careful experiment.

With regard to the opinion expressed, that such addresses tend to retard, rather than advance, the progress of the science, I will only observe that others, in common with myself, from their experience, hold a contrary opinion.

I may be wrong in thinking that, if the attention of members of photographic societies were more frequently directed to the comparatively imperfect state of photographic chemistry, many ardent admirers of the art, who now mechanically perform all the delicate operations which its practice involves, without ever troubling themselves about the why and the wherefore, would be induced to apply themselves with energy to the solution of some, at least, of the problems that remain to be solved.

I feel persuaded that the sooner we disabuse our minds of an idea, which is very prevalent, that the investigation of the chemical phenomena of photography belongs to, and ought to be left exclusively to, the professional chemist, the sooner are we likely to have the number of minds engaged upon it increased; and, as a consequence, we may reasonably expect that its progress will be more rapid and satisfactory.

I am not insensible to the difficulties that attend all purely scientific investigations; nor am I so sanguine as to expect that we can, without much trouble, or in a short time, bring our researches to a satisfactory conclusion.

The Chorlton Association may or may not include some who require to be constantly patted on the back by way of encouragement, in order that they may be prevailed upon to continue any scientific or other investigations upon which they may be engaged. But admitting the policy of pursuing such a course, with minds so constituted, it does not therefore follow that the simply passing in review some of the facts and phenomena which still remain unexplained will have the effect of paralysing their energies. On the contrary, I believe its tendency would be to produce an opposite result.

The hypothetical case, of the president of a medical society opening a session by an introductory lecture on the present unsatisfactory state of our knowledge of medicine, is not such an one as is applicable to the case, for, however desirable it might be in itself that such lectures should occasionally be given, the fear of disturbing public confidence would at once point out their impolicy.

I do not know whether the majority of the readers of photographic journals agree with Mr. Hardwich, that the matter they are expected to contain should be of such a light and easily digestible kind as to entitle them to take rank only with the daily newspaper or other periodical literature. For my own part, I have always looked upon them as partaking more of the scientific character, and as such deserving and requiring more than a passing glance.

It is with extreme regret I find myself at variance, even in such minor matters, with a gentleman so distinguished, and to whom we owe so much, in the chemical department of our art. But holding the views I do, however erroneous, as to the manner in which the science can be best advanced, I have felt it incumbent on me not to allow the opinions of even so high an authority to pass unchallenged.—I am, yours, &c.,

W. GRIFFITHS.

November 8th, 1860.

ANSWERS TO CORRESPONDENTS.

T. G. —Received with thanks.

Geo. M.—It is not of sufficient interest to be entitled to a notice.

F. P.—We do not coincide in your view of the matter in any way. Perhaps one of our contemporaries may, though we doubt it

R. S.—It must depend upon your requirements. Without you state what you want to do exactly, it would be impossible to say what amount would provide you a proper outfit.

Thos. Quinlan.—Mr. Wilson, of Aberdeen, will be able to supply your wants; or you may procure his productions in several of the shops of the London dealers.

Dipper.—We are constrained, from press of matter, to postpone your communication; it shall, however, appear in our next.

R. F.—Your sensitising bath has no doubt become impoverished: add more nitrate of silver.

Tinner.—Your crystals are protosulphate of iron, and require no preparation to fit them for use—except perhaps, if dirty, solution in pure water and re-crystalisation.

J. Magrath.—The third on your list is in our estimation the best; but different operators work most readily with different kinds. Much also depends upon the class of work which you wish to execute.

Quartz.—We believe that geological illustrations are to be had of Mr. Gutch. We remember to have seen some excellent specimens, by this gentleman, at one of the Photographic Society's Exhibitions a few years ago.

F. B. D.—You have not properly removed the iodide of silver from the edges of your plate: hence the white patches in the print. Leave the hyposulphite solution on a little longer, or use it a little stronger. The pose is not bad.

Troubled.—Asking us to recommend a camera is like asking a stranger to recommend you a house. How can we advise discreetly without knowing to what purpose you wish to apply it?

Margaret L.—We think that Mr. Skaife's small apparatus, which he calls a "pistolgraph" (a tool infinitely better than its name), is exactly suited to your requirements; and with very moderate care you need not soil your fingers.

R. Peers.—A swing-back camera does not require a sliding front any more than an ordinary camera, but for landscapes we should regard both as imperfect without sliding fronts.

J. A. R. (Retford.)—1. A small-sized portrait combination by a first-rate maker. 2. Possible; but not advantageous or economical. 3. A quarter-plate, or a smaller one better still. 4. Same as the preceding, with diaphragm between the lenses. 5. Sometimes the last-named, at others the ordinary view lenses.

Victor.—Too late for our last. If you develop with pyrogallic and citric acids the colour will be bluish black; if with pyrogallic and acetic acids a reddish tone will result. By mixing the two in various proportions, browns of almost any shade between the extremes may be obtained. Covering the film while wet with hydrosulphate of ammonia and water will also turn the deposit of a brown colour.

A Printer's Devil.—Too late for reply in our last. Sensitised paper discolours very rapidly in the presence of *moisture*: it is therefore probable that your blank paper book is damp. Use a little free nitric acid (very little) in your sensitising bath; dry the paper thoroughly, and keep it in a tall wide-mouthed bottle, well corked. We have never seen the effect you describe in the skies. We do not advise any automatic washing apparatus.

Kelvedonensis.—1. Use a little ox-gall and gum-water with the colouring matter. —2. We do not know the preparation you mention, except by name; but *good* negatives and positives cannot both be obtained with the same collodion without some modification.—3. Chloride of calcium greedily absorbs moisture, hence it hastens the drying of bodies enclosed in a case with it.—4. We believe the advocates of the process named say for several weeks: we do not personally think well of it.—5. See a note from Mr. Rodgers in the present number.

We are informed by a correspondent that a tent purchased by him in consequence of a description he read of it in the letters by Simeon Headsman, although well adapted to his purpose in other respects, was so badly made that, by a tolerably strong shake it would come to pieces—that rods described as of brass were, in his specimen made of iron—and that a gutta percha tray with a tube to carry off the waste water, had the tube so far projecting into the tray that its intended use was completely obviated, and the tent flooded with the washings, &c. from the plate.

We can depend upon the correctness of the description of our contributor; but it is impossible for him to divine that inferior articles to those exhibited to him will, in some cases be supplied to the public. It appears also, to us, very dishonest on the part of the dealer.

R. T. D., a Novice.—No apologies: we are always willing to lend a hand. There is a very simple and cheap vessel in which you can prepare your arrowroot that is preferable to a tinned saucepan—we mean a common earthenware pipkin. It is probable that the paper may be properly coated by floating. A very satisfactory proof upon arrowroot-coated paper was exhibited by Mr. D. W. Hill, at the last meeting of the North London Photographic Association. We note your remarks on "what to avoid," and will give a hint. Skies should *not* print white, especially if the negatives have been taken in dull weather—a condition of things which we perceive existed when you took the National Schools (in which the sky is stopped out), though a slight gleam of sunshine appears in the other. The fact is, that from the low actinic power of the light at the present season a long exposure is required to obtain details, and sometimes the sky is thereby very much weakened in density. A small quantity of dilute albumen added *while developing*, will materially increase the vigour of your negative—but beware of developing too far.

⁂ An unusual pressure on our space has obliged us reluctantly to hold over till our next many valued contributions, among which we may enumerate *Photographic Comments, No.* 15;—*Observations on Albumenised Paper and Alkaline Gold Toning, No. IV.; Photogenic Tribulations;—Photographer's Holiday in Derbyshire;*—Continuation of Mr. Wall's *Practical Instructions on Colouring;*—Mr. Malone's interesting paper, read at the late meeting of the London Photographic Society, communications from "W. R." and "R. G.," &c., &c.—all of which are in type.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 131, Vol. VII.—DECEMBER 1, 1860.

NOTICE TO SUBSCRIBERS. — With each copy of our number for December 15th will be presented to our readers a MINIATURE PHOTOGRAPHIC ALMANACK, produced under the superintendence of Samuel Highley, F.G.S., F.C.S., &c., which will contain, besides a Calendar for the year 1861, " A Retrospect of our Photographic Year;" Days, Hours, and Places of Meeting of Photographic and Scientific Societies in Great Britain and Ireland; Formulæ for Wet, Dry, Instantaneous, Negative, and Positive Collodion Processes; Waxed-Paper Process, Printing Process, &c; "Photographic Olla Podrida," Useful Tables, Measures, Notes, &c. The particular form adopted has been selected in order to facilitate frequent reference at *all times*. It is proposed, also, to issue copies of the Almanack to non-subscribers to the Journal, at 3d. each copy, in order still further to encourage attention to our fascinating Art-Science.

In our number for the 1st ult. we published a communication from our esteemed correspondent, Mr. Corey, of Liverpool, in which he called upon us to express our opinion relative to the dry process originally suggested by the Abbé Despratz, and which some of our Liverpool friends, including Mr. Corey, have found to be in their hands highly satisfactory. The process consists in employing collodion containing a small quantity of pure white rosin in addition to the other usual ingredients. The manipulation is precisely the same as for ordinary wet plates, with the exception that, after being taken out of the sensitising bath of nitrate of silver, they are copiously and freely washed, and then set aside to dry. It is alleged that these plates retain their sensitiveness unimpaired for a very considerable time, and are more quickly impressed than any other dry plates which our correspondent has ever tried.

We regret that we are unable to share the enthusiasm of Mr. Corey in favour of the rosin process, for the following reasons, viz.:—We find that the film formed by this kind of collodion is unusually liable to be defaced by small white spots, about the size of a pin's head, no doubt from the presence of very minute particles of insoluble matter in the rosin, which have not sufficient gravity to cause their perfect deposition, by allowing the collodion to remain undisturbed for a considerable time. We find, also, that the film, after development, is particularly apt to strip off the plate in the subsequent drying, splitting up into innumerable shreds and fragments. It is contended that this latter evil can be remedied by coating it with albumen before the final drying—a proposition which we admit. We have compared the sensitiveness with that of plates prepared by the Fothergill process, and in our hands they are unquestionably inferior in that respect to the latter; while, as regards "keeping" qualities, we have found that it is quite possible to preserve the Fothergill plates for upwards of *ten months* in a highly sensitive condition. We have been favoured with several specimens of prints from plates by the rosin process; but, with the exception of one by Mr. Corey, they all displayed the evidence of weakness in the negatives—the exception, in our judgment, exhibiting under-exposure, though in this case we are informed that the operation took place during a shower; therefore, we may presume that, had the weather been more favourable, the result would have been, in Mr. Corey's skilful hands, satisfactory. We have, however, kept to the last our chief objection to the process, which is, that the introduction of the rosin ought, upon theoretical grounds, speedily to throw the sensitising bath out of order. We cannot imagine that an organic substance like rosin, brought into frequent and intimate contact with nitrate of silver, can possibly fail of contaminating it in such a manner as effectually to deteriorate, if not eventually destroy, any certainty of actinic action upon the film: judging from the pernicious effects of carbon, even when used merely as a centre of crystallisation for nitrate of silver, as distinctly proved by our *collaborateur*, Mr. Hardwich, we are unable to believe that a carbonaceous substance like rosin can be innocuous when introduced into the nitrate of silver bath. We do not *know* this from actual experiment, simply because we have held the process in sufficient disesteem, upon these scientific grounds, to deter us from making more than a few trials of plates prepared by it; and the result of these trials, being discouraging, has not induced us to pursue the investigation further.

We demur, also, to the alleged pre-eminent simplicity; because, if it be necessary to coat the plate with albumen at all (*e. g.* to prevent destruction of the film at the final drying after development), it is surely no more trouble to perform this operation before the first drying, and prior to exposure; while the advantage of this proceeding is obvious in the entire or partial coagulation of the albumen by contact with free nitrate of silver, and thus its non-liability to decomposition by moisture to some extent is effected.

If our allegations be well founded, we submit that we have adduced sufficient for holding the rosin process in disfavour; but if not, we shall only be too glad to be obliged to recant, by the excellence of the productions which we trust that our Liverpool friends who follow this process may show at some of the forthcoming exhibitions. We by no means claim infallibility for the correctness of our views, and are ready to change them if proved to be wrong; but, as we do at present entertain them, called upon publicly as we have been, we have no option but to give expression to them. Liverpool photographers are far too earnest seekers after excellence to feel annoyed at the non-agreement between themselves and us upon what is, after all, but a mere matter of opinion.

We certainly experienced no small amount of surprise at the turn which was given to the discussion on Mr. Rothwell's paper at the last meeting of the London Photographic Society. We can well enough understand how thoroughly unintelligible such a paper would be, even to minds of a mathematical bent, when not only all the geometrical and arithmetical calculations, but the diagrams also, were omitted; but to the generality of those present it might almost as well have been delivered in the vernacular of the Cherokee Indians. That which makes the proceeding the more singular is an announcement in the September number of the Society's organ, at p. 330, that "Mr. Rothwell is desirous that gentlemen should come prepared to discuss the merits of the subject on which he treats;" yet, in consequence

of his own absence, which we much regret, and presume was unavoidable, his communication was mutilated, and the discussion was really diverted from the subject of the paper, chiefly to a consideration of some of the first principles of perspective, as indeed was noticed by one of the speakers. While upon this subject we cannot forbear remarking that, had those gentlemen who advocated the propriety of depicting parallel lines in nature by converging ones in the drawing when the plane of delineation is placed parallel to the object, only perused the conclusive papers *On Perspective and Distortion*, by Mr. Grubb, published in the current volume of this Journal, at pp. 74 and 143, they would in all probability have had clearer views on the subject; and we strongly advise those who feel an interest in it to re-peruse the articles to which we refer.

An elegant application of photography has been made by Mr. John Louch in multiplying copies of monumental "brasses," as they are termed. From an ordinary rubbing, a negative is formed in the pressure frame by exposure to light, and this is fixed and waxed in the ordinary manner. Sensitised chloride papers are then exposed under the negative until the parts which are bright in the original "brass" are thoroughly *bronzed*, and the parts corresponding to the *blacks* of the negative (that is the *lights* in the positive print) have become black from very extended over-exposure. A dense and well-defined negative is that best to operate with; and the positive paper should be both rich in chloride and also in free nitrate of silver, but not highly albumenised. The printing should be slowly performed in diffused light. The proof then requires fixing and toning with gold, the bath being tolerably rich in the latter material: the effect produced being to *deposit the gold in a metallic form* upon the bronzed portions of the proof, while the other parts acquire a rich black colour, so that the finished specimen bears a striking resemblance to the original "brass."

The specimen with which we have been favoured by Mr. Louch, though not perfect, indicates unmistakeably the feasibility of the scheme; and we have no doubt that such method of reproduction will become highly popular amongst those whose taste lies in this direction.

We understand that Mr. Aspden has been appointed Local Assistant Secretary for the Manchester meeting of the British Association for the Advancement of Science, next year. This gentleman is a member of the city council, and we should imagine that municipal influence had much to do with securing his election. Judging from a photographic point of view, we should certainly have given the preference to another candidate whose general qualifications render him exceedingly suitable for this onerous appointment.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. 15.

We have, at various times, endeavoured to prove the importance of using pure nitrate of silver for the negative bath; and a reference to the back numbers of the *Journal of the Photographic Society* will show no less than four communications of ours upon that subject. The following extracts give an idea of the facts and opinions at the time when these papers were written (May 21, 1858):—"Both the fused and the crystallised nitrate of silver are found occasionally to fail in the negative collodion process. Some samples appear good, and others bad, without any very obvious difference between them being observable. On one occasion a negative bath was prepared from the commercial crystallised nitrate of silver, the trace of nitric acid being neutralised, and the solution acidified faintly with acetic acid. This bath was taken into the field, with an ordinary landscape camera for plates nine inches by seven. The collodion was rather an intense sample, simply iodised, and inclined to give red negatives, so that success ought to have followed as a matter of course, without the use of acetate. So far from such being the case, however, everything went wrong. On applying the developer it was evident, by the manner in which the sky came out, that the picture would be a failure. The image was thrown down in the grey and metallic form, and there were numerous spots and brush-like prolongations from various parts, such as the spires of a church, &c., giving the appearance as if the image had been imperfectly focussed. The cause of the defect, however, was in the bath; and, fortunately, a friend, who lived near, was able to provide another bath, with which good pictures were taken.

"To ascertain, if possible, the cause of the above peculiarities, another sample of impure nitrate of silver was examined, and the conviction gradually arrived at was, that it contained traces of some organic matter. No positive opinion can be given as to the source of the organic matter; but attention may be called to the fact that, in the assay processes, it is usual to employ small fragments of charcoal to prevent 'bumping' of the acid, and in consequence the acid acquires a brown colour. It is questionable whether one crystallisation is sufficient to free the salt from such a contamination."

The following extract is from a paper bearing date September 21st, 1858:—"Doubts having been expressed as to the correctness of statements made in this Journal on impurities of nitrate of silver, it seemed advisable to institute fresh experiments, and especially so as the principals of a firm who manufacture nitrate of silver on a large scale, agreed to render every assistance. Samples of the acid mother liquors which furnished the crystals, were evaporated to dryness, and then pulverised and dried at 240° Fahrenheit. The following were the results obtained on comparing the impure with the pure nitrate:—

"*No.* 1 (Pure nitrate).—Time of exposure for a stereoscopic view in a moderate light, fifteen seconds. The image develops with a full amount of intensity, and has a tone of red in the sky: superficial bloom well marked.

"*No.* 3 (Thought to contain only a small amount of the impurity).—Exposed fifteen seconds, as before: this was too little. With thirty seconds in the camera a tolerable picture was obtained, but the development was less vigorous than with the pure bath; and the whole image, but particularly the sky, appeared grey and metallic. An indistinct appearance was observable about the lines of the picture, which were blurred, not from defective focussing, but by a deposit of silver taking the direction of the draining in the slide. A chimney, for instance, appeared to have smoke issuing from it, although nothing of the kind was visible upon the ground-glass of the camera. Most frequently the blurring was of the opaque kind, but sometimes the reverse obtained, and a translucent halo was seen. When the sun shone out strongly the blurring nearly disappeared. Different samples of collodion were next tried. Those succeeded best which produced red and intense negatives in a pure bath; but all gave negatives of inferior quality. One sample of collodion, rather strongly coloured from liberation of iodine, produced an average negative in the pure bath, but gave *a transmitted positive*, nearly perfect, in the impure bath."

* * * * * * * *

The foregoing will suffice as a statement of the defects encountered on the occasions referred to. Having determined, in a manner satisfactory to our own mind, that organic matter, oxidised by nitric acid, was the cause of the want of intensity, and that such nitrate of silver could only be purified by a second crystallisation, we allowed the matter to drop. Latterly, however, we have received fresh complaints of the ordinary commercial nitrate of silver; and the subject has also been brought particularly before us by some remarks made by "S. H.," at page 242 of the seventh volume of The British Journal of Photography:—"Messrs. Hopkin and Williams, in recrystallising nitrate of silver in their own laboratory, have found that they can only obtain 150 oz. suitable for photographic purposes out of 200 oz., and that the remaining 50 oz. from the mother liquor are quite unsaleable."

In consequence of the above remarks, we procured half-a-pound of the unsaleable product referred to, and examined its action in photography. In describing the defects discovered, it appeared unnecessary to write a new paper, since it would have been a mere repetition of the statements contained in those previously published. There was the same poverty in the image, and the same slowness of developing, whilst the exposure required was so considerable as to unfit the bath for use. Looking at the negatives, many would have said that the bath contained nitric acid. But it was not so, for every trace of nitric acid had been neutralised. Since the year 1858 our knowledge of collodion has improved, and we can, therefore, specify more exactly the quality of collodion which fails most signally in such a bath: it is that prepared from pyroxyline made in acids weak enough to yield a product only partially soluble in the ethereal liquid. Every picture will be blurred and indistinct with such a combination of bath and collodion. We

notice, also, an effect of *bromide*, of which we were ignorant in 1858; for, by adding it to the collodion, we were enabled to produce a picture even in the impure bath, whereas with the simple iodised collodion, free from bromide, no details could be obtained in the shadows.

To avoid wearying the reader, by going over old grounds afresh, we will content ourselves with describing one additional experiment, made with a view of indicating the nature of this foreign substance in nitrate of silver. Supposing the impurity to be organic, it ought to be nearly or quite destroyed by very strong fusion. We, therefore, melted a sample of the nitrate of silver, and afterwards raised the heat until a considerable portion of the nitric acid had been expelled, and a deposit of metallic silver left at the bottom of the vessel. The next step was to bring the material back again into the state of nitrate of silver, by boiling with pure dilute nitric acid, until everything had been taken up, and the nitrate of silver decomposed: on evaporation, a white crust of the reconstituted nitrate of silver remained in the capsule. The result of this experiment was most remarkable, and it entirely restored the lacking intensity. Negatives taken in the bath from the purified nitrate had all the bloom and redness of negatives taken at the same time in a pure bath, although, from the nature of the purifying process to which the nitrate of silver had been subjected, we cannot suppose that any inorganic body, such as nitrate of copper or nitrate of lead, had been removed. Everything, in fact, present before must have been present after, with the sole exception of organic matter, which would have been burnt away.

A question arose with reference to this impurity in nitrate of silver: has it anything to do with the difficulties which sometimes occur in the alkaline chloride of gold toning process? Our experiments, as far as they have gone at present, give a reply in the negative. On dividing a sheet of albumenised paper in half, and sensitising one portion on a sixty-grain solution of the pure, and the other on a similar solution of the impure, nitrate, both were found to tone in a satisfactory manner.

NEW PORTABLE OPERATING CHAMBER.

By T. Maltwood.

[Most of our readers will remember that on a former occasion we described a "Finder" for the microscope, in which photography was applied to micrometrical purposes by the ingenious contriver of the following, which he has so well described that we adopt his own words.—Ed.]

That the wet collodion process is generally regarded as possessing advantages superior to any other, is pretty clearly demonstrated by the fact of its being almost universally adopted by photographers when taking pictures at home, where they can avail themselves of the comfort and facilities of a well-lighted and well-fitted dark room.

I think there can be no question that all that has been done in the way of dry plates has been brought about by the want felt of a dark room possessing all the necessary conveniences for operating in, and at the same time sufficiently portable to allow of its being transported to any desired spot, without trying either the constitution or the pocket of the tourist.

I must confess to a decided predilection in favour of dark boxes; and some time back I made one similar to those introduced by Messrs. Burfield and Rouch three or four years ago; but this did not at all satisfy me, and after trying several plans, I succeeded in making the one I am about to describe.

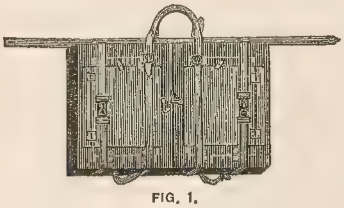


FIG. 1.

It is shown in *fig.* 1 closed, and can be carried by the handle, like a carpet-bag, or on the back by means of straps fixed on the bottom—the size being twenty inches long, five wide, and thirteen inches deep outside.

Fig. 2 represents it open and ready for use, forming a dark chamber twenty inches long, thirteen wide, and fifteen high, raised on legs, which are attached by pins fitting into brass sockets in the bottom of the box. A is a mahogany tray, five inches deep. B B, the flaps that cover it when closed, are fitted with yellow glass in a hinged frame, forming both a window and door at each

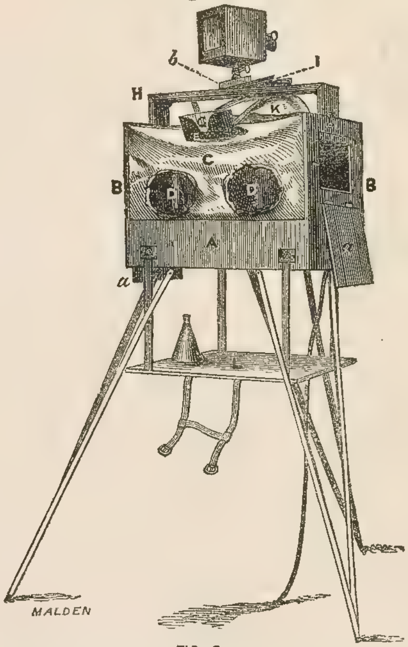


FIG. 2.

end; *a a* shutters to protect the glass when travelling. C is a piece of single texture india-rubber cloth, fixed to the sides of the tray A and flaps B B, by means of which we get three times the size of the tray, and add only a few ounces to the weight. D D are sleeves, through which the hands are passed into the inside. E is a piece of yellow glass, through which the operator looks. G, a piece of loose leather, which can be brought over E, and greatly facilitates seeing what is going on inside, by shutting out external light. The stage, H, keeps the flaps, to which it is fastened, perfectly rigid, and the upper part, I, is made to rotate, not only to get any angle that may be required for stereoscopic pictures, but so that different views may be taken all round the horizon without changing the position of the box. *b* is a small block of wood sliding into I, and is fitted with a spirit level, and a ball and socket which carries the camera. K is a flexible portable cistern (*fig.* 3), capable of carrying about a gallon and a half of water, having a brass cock fixed on one side. This cistern is laid on the top of the box (or may be fixed at the back), and the brass cock, passing through a hole in the india-rubber cloth, places the supply in the cistern at the command of the operator.

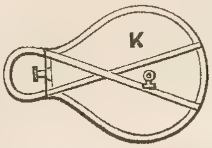


FIG. 3.

The bottom of the tray is divided into three spaces, as shown in *fig* 4, each being separately watertight, and affording convenience for packing the camera, chemicals, &c. The silver bath drops through a hole in the back left hand corner, the large space at the right being reserved for developing and washing, and has a hole with a piece of flexible tube attached, through which the waste water is discharged. L is a shelf, suspended under the box by two straps, which draw up and fasten with hooks and rings, as shown in *fig.* 1.

FIG. 4.

The weight of this box, containing stereoscopic camera and lens, one dozen glass slides, and an abundant supply of chemicals for a long day's work, is as nearly as possible 20 lbs. This may seem a good deal to some; but the convenient form, and the arrangement for carrying it like a knapsack, considerably lessen the difficulty. This I can say from experience, having carried mine during a three weeks' tour last summer, over all sorts of ground, and into every place I could possibly have reached without it.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

No. I.

By John Cramb.

Walking into the office of a friend one day towards the end of last March, I was accosted with the interrogation:—"How would you like to go to Jerusalem?" Who would not? No wonder that, without further thought, I replied:—"Few things would please me better; but," I immediately inquired, "why do you ask that question?" "Because," said my friend, "a gentleman of my acquaintance has been for some time hunting up and down for some one to go out to Syria and Palestine, to take photographs of the places of scriptural interest in those countries, and I told him last night I knew the right man for the place, if he would go. "Now," said Mr. B., "will you go?" But, without waiting for my reply, he continued,—"Go home, and consult over it. My friend and I will call on you to-morrow: make up your mind, for there is no time to lose."

Sitting comfortably round the tea-table, after sipping our "Lapsang Souchong," the reader may suppose how I astonished our home circle by the announcement—"I am thinking of going to Jerusalem!" Explanation followed, and we were soon deep in *Murray's Handbook*, *The Tent and the Khan*, *The Land and the Book*, &c.

Next day brought the searcher after Syrian landscapes to my domicile. I soon learned what he wanted; and, among other conditions, found he had made up his mind that no one would answer his purpose who had not been accustomed to working a dry process. We will see afterwards how far this was a wise or necessary requirement. I had for several years successfully practised the old, simple albumen process on glass, which was at once deemed dry enough for any purpose; and it seemed my partial friend had not over-estimated my photographic suitability for the journey. Though I would not probably have been willing to confess I was at all ignorant of the geography, history, and, above all, the present social and political position of the Holy Land, yet I fear it was so; and, to make up, books of travel had to be gone through at an express-train rate their authors never contemplated, and in two or three cases the information so obtained had to be confirmed and supplemented by an interview with the authors themselves. An immense amount of information was wanted in the shortest possible time, and in the fewest words. I wanted to learn, if I could, all that I now know, and mean to tell in this series of papers. All that I could not. On two or three points satisfactory information had to be got before the enterprise could be entered on. The climate, I understood, from the position of the country, would approach the tropical; but on that point I found little distinct or reliable information in the journals of travellers, or by *viva voce* interrogations of those who had been throughout the country. Few of those who write on Palestine have lived in the country, and only a very small number attempt to indicate its temperature, even at the time they were there. And, again, I could find no one who had been there during the months I would likely have to spend in the Holy Land, if I went this season. English travellers are recommended to visit Syria and Palestine in spring, or late in autumn. Spring was already begun, "in name at least," and before I could be there, though I left immediately, it would be far advanced: to delay till autumn the publisher thought would be out of the question for his purpose. And yet why be so anxious for knowing the heat in figures? How much information does it convey to us of how we would feel to be told the temperature at such a place is 56° or 106°? There is so much to modify our feeling under such circumstances,—the amount of moisture in the air, &c. But suppose the proposition be accepted, that whatever heat the people of the country were able to bear I could,—would the chemicals be as accommodating? There was no denying I had to *leap* over this preliminary difficulty by the desire to visit scenes of such transcendent interest; but that could scarcely be expected to extend to iodised albumen. Photographs had been done before, but at what season? A sentence in one of Mr. Frith's descriptions was not very hopeful. He speaks of the collodion *boiling* in the bottle; but adds, he got over that difficulty: he does not, however, say how? I was not proposing to use collodion, and perhaps I would get along, operating at a temperature that boiled ordinary collodion. There was still a "lion in the way." Is the country safe for Europeans, and, above all, is it likely to be so for one travelling alone, as I would have to do? Friends interested in my safety and welfare are alarmed by accounts of plundering Bedouins and equally unscrupulous Fellahs, and visions of a solitary Scotchman enacting the part of a "certain man who went down to Jericho, and fell among thieves," without the prospect of any Good Samaritan to pour oil and wine into his wounds, and the certainty that there was now no inn to which he could be taken.

Not to tire my readers, all objections were overcome, or overridden I should say; and having resolved to go to Palestine, how could I get there? Jaffa, the port for Jerusalem, can be reached in three or four different ways. A French company, the Messageries Imperiales, have a line of steamers, which sail each alternate Sunday morning from Marseilles, *viâ* Malta and Alexandria, to Jaffa. Marseilles is easily and quickly reached by rail through France. This route I chose, to avoid the Bay of Biscay, being a very poor sailor. The cheapest and most direct way of going to the Holy Land is by the excellent screw-steamers plying between Liverpool and Beyrout; and many English travellers, who prefer going by an English ship as far as they can, go by the Peninsular and Oriental Company's steamers from Southampton to Alexandria, and from thence take a passage in either the French, Austrian, or Russian steamers, which call at Alexandria, and land passengers at Jaffa or Beyrout. The Peninsular and Oriental Company also take passengers from Marseilles to Alexandria. Another course may be followed:—go to Trieste by rail, and from thence to Jaffa or Beyrout, by the Austrian Lloyd's steamers.

Presuming it will be interesting to the readers of the Journal, I will now briefly state what I purposed doing, photographically, in the Holy Land; what preparation I made before leaving; what instruments I took with me, and what chemicals; and how all was packed.

It was intended I should take a series of 8 by 10 in. views of all the places and objects of interest I should visit, and as many pairs of stereoscopic negatives. I resolved to albumenise all the glass I should take before leaving. It was considered desirable, in order to reduce the weight as much as possible, that not more than twice the number of glasses should be taken that we wanted of good negatives to be brought home—a rather narrow margin I thought then, and still think. It was resolved I should leave on the 9th April, or in less than a fortnight from the time I decided on going. About 600 glasses had to be coated within that period.

I do not know that it would be interesting to tell exactly the quantity of each of the various "chemicals" I took,—or the number of dishes, funnels, measures, &c., as a different number and kind would be required for another process, or a different manner of working even the same one. I found it somewhat difficult to estimate the quantity of each substance; and in one case the quantity taken fell far below the actual requirement—namely, of acetic acid. I would have required at least three or four times the quantity, or about 124 ounces. The modern photographer's main requisite, collodion, I did not expect to require. I, however, took a little to try a wet plate perhaps, or a collodio-albumen, or a Fothergill one, and as much as anything to see how it behaved in the transit, and under the expected high temperature of the country.

In the apparatus department I took scarcely any duplicates, and would not recommend any to be taken. I had long been accustomed to take my stereos with a camera which, I suppose, I may call of my own invention, though really the principle of its construction is described in an early number of the *Journal of the Photographic Society*. There are no slides, and the plates pass from the box into the camera, and are again returned after exposure into the same grooves in the plate-box. I use two cameras on one stand, a considerable distance apart, but adjustable. As the cameras are but the thickness of the wood larger than the plates used, they are very *small*. I resolved to have my camera for 10 by 8 in. size placed on the same stand, in the middle, between the two stereo. ones. This arrangement I found answered admirably. By it I was enabled to take the large and stereo. pictures at the same time with one stand. I had no 8 by 10 in. camera suited for the journey, and had to have one made. Though made, I presume, as carefully as possible, it stood the climate very indifferently. Its twisting and cracking cost me several plates, and more than once risked the loss of a subject altogether. My old well-seasoned stereos never gave me any trouble more than working at home would, and they were no gems of cabinet work: their superiority mainly lay in being old and well-seasoned, and something in the plan not requiring so exact fitting as slides do. No photographer should risk going with newly-made instruments on such a journey. My lenses were by Ross, and had not their character to gain; and I need not say they were quite as reliable in photographing the *Mosque of Omar* as they had before been in doing the same thing for *Glasgow Cathedral* and the *Arc de Triomphe*.

Having got the apparatus and materials, we had to have them suitably and safely packed. I may premise that there is no wheeled conveyance in Palestine. Everything is carried on the

back of mules, camels, or donkeys. The ordinary behaviour of the first and last in this country did not seem to promise much security for the safety of the glass and the other fragile materials of a photographic outfit. We were, however, assured that Syrian donkeys had more respect for the property of their owners or hirers than their British-born brethren generally manifested. The stock of albumenised glass I packed in the following manner:—Pieces of card-board were cut of the size of the glasses, and their centres taken out, so as to leave about a quarter of an inch all round the margins. These card-board slips are then placed between each pair of glasses, albumen sides to each other, and placed in paper. These are again tied up in packets of twelve, or of six pair rather, and put in paper. The packets so tied up are put in a box, with deal partitions between each parcel. This box, when filled, and having sufficient soft material in each compartment, is again placed inside of another and larger box, having a space of at least two inches all round, filled with soft material. By this arrangement I was able to send home my negatives from Syria without so much as a scratch—not one broken or otherwise damaged. The plan of slinging the boxes over the mule's back require that both sides be equal. It is, therefore, desirable that each box have as near as possible a counterpart in weight, and size, too, in fact.

I had some difficulty in ascertaining how much a mule could carry. I now know that any mule will carry easily, over any Syrian road, bad as they are, about two hundred weight, and a good one nearly double that amount. What a deep sea of terrors this same carrying of glasses and porcelain dishes on donkeys' backs was to me before leaving this country! The reality, I found, with ordinary care, to be as safe as any mode of conveyance I can think of, and incomparably more so than by rail, as ordinarily done. I can as easily suppose a traveller returning from an Oriental country with quite an opposite tale, if he had been accustomed to handing over himself and baggage to the railway or steam-boat company for safe transport to his destination. He would find the ever-imperturbable, large-promising, but scant-performing, Syrian Mukhari no very safe custodiers of either valuable or fragile property, if treated in the manner he had acquired in his Western travels. The muleteers are only reliable when very sharply and continuously looked after; and the ordinary practice of the country is to do everything with the largest possible amount of bullying and scolding. A carefully-loaded mule will travel a day over the most hazardous roads without stumbling; while if the load be improperly put on, it will be a continual source of delay, and may risk the safety of breakable materials, even with the most careful supervision while travelling. As I had always been accustomed to "look after my luggage," to use the language of the railway bills, I had no difficulty in acquiring the habit of being always near my traps while loading and unloading, and never far from them on the road either.

My readers may not be interested in knowing the contents of my portmanteau; and yet I wished the authors of the books I had access to had given more information on common things. The dress required in Palestine during all but the coldest day of winter is as light outer-clothing as we ever wear in this country. Calico or linen suits are best, and most worn in summer. The less one can think of doing with the better during the warm weather. The head is the only part of the body requiring consideration; and European travellers should learn of the natives, of whom it is humorously remarked that they carry their whole wardrobe on their heads. On a Syrian summer day, the stalwart son of Ishmael may be seen clambering the steep sides of the dreary mountains, or scampering over the fertile plains of his ill-governed country, with less than the most liberal modesty would require as a covering for his person, but with as much as a pair of English blankets wrapped round his head! The purpose of this is to keep the head *cool* by protecting it from the direct rays of the sun; to save the wearer from sun-stroke—that most terrible and too-frequent consummation of a residence in eastern countries. A very light kind of hat, made of pith, is the most perfect protection for the head I can conceive; and I would take the opportunity of recommending them to all intending travellers in warm climates. As usually made, they are helmet-shaped, and not over-sightly to our eyes; butth at is soon got over when the time for their use arrives. I use essly loaded myself with under-clothing, as I had been informed the washer-woman was not one of the institutions of Syria. To the lover of spotless linen I can now, however, say:—"Fear not; you can have your 'eureka' done up to the satisfaction of the most fastidious in Jerusalem and the larger cities of the Holy Land."

I must skip much of my preparations, as time presses. In my next I will give the first part of my journal proper.

ON AN ALLEGED NEW PROPERTY OF LIGHT.

By T. A. Malone.

I have, from the first announcement of M. Niepce de St. Victor's alleged discovery of a new property of light, taken a constant interest in the controversy to which it has given rise. I have ever been sceptical as to its truth, thinking it might be explained by a reference to known physical laws. Although I had formed several opinions as to the cause of the result, I took no experimental steps until after the appearance of Mr. Crookes's demonstration that the heat and moisture of the tube, joined to the tartaric acid used, were sufficient to account for the result of M. Niepce's main proof experiment. M. Niepce, thus apparently set right, replied to Mr. Crookes by making the same experiment under a freezing mixture arrangement. He still got the result he had along insisted upon; but he owned that heat and other agents could simulate his original results. Not observing any reply from Mr. Crookes—who I believe was then much occupied—I determined to read M. Niepce's original papers in the *Comptes Rendus* of the French academy. I there found that M. Niepce set out in a manner dangerous for most experimenters, namely, with the notion that light *might* be absorbed by bodies in such a way as to be given out again; the action to be made manifest by photographic papers. A great number of experiments, made in a variety of ways, convinced him that he was right in his conjecture. Disregarding, for the present, his earlier forms of experiment, I decided on examining most scrupulously his latest result, given in reply to Mr. Crookes. I read carefully his note, and was at once struck with the form of his experiment He places between the vessel containing the alleged stored-up light a piece of paper, having impressed upon it what he calls *gros characteres*, which by some odd association of ideas I interpreted to mean the heading of a newspaper. I came upon this thought by recollecting that the French printers use an ink which is very offensive to an English taste; and it at once occurred to me tha the tarry ink might be at the bottom of M. Niepce's result. I had previously made experiments with creosote of wood-tar, and found it to act upon nitrate of silver. Whatever these notions were worth, they induced me to resolve to try at once M. Niepce's experiment, minus the chief agent—the light. I took advantage of the opportunity the London Institution newspaper-room affords to secure a freshly-arrived copy of the *Indépendence Belge*, the bituminous odour of which was unmistakeable. It was the evening edition, and arrived here early in the morning. I at once placed it in a dark room, with its title-page in contact with a paper washed over with a neutral solution of nitrate of silver. I left the whole in the copying-frame for an hour. M. Niepce names six hours. After that time, just as I anticipated, I got by a wash of gallic acid a distinct impression of the printed letters. They appeared to be positive; but on looking at the paper against the light, I found this appearance to be mainly due to the penetration of gallic acid wherever the letters had been in contact: a *differential action* was evidently at work, and accounted for all the appearances. *No light was used by me during the experiment.* A copy of *The Times* newspaper, similarly treated at the same time, gave only the faintest indication of its title: only that I looked for it it would have escaped notice. The other paper was distinct in its action. Upon drying the result a curious appearance was observed: the surface became faintly negative, as though the printing-ink had suspended, on the surface, the reduction of the silver salt. The *back* of the paper now presented an appearance well known to Talbotype photographers, namely, that of a negative become positive at its back. This I think due to the penetration of the gallic acid, and a consequent *internal* spontaneous deposit. These differential actions will doubtless now be made clear in all their relations. Upon informing Mr. Hardwich of my results, he reminded me of a paper by Mr. Busk, who proved that almost any engraving, without exposure to light, could be shown to have the power of suspending the photographic properties of chloride of silver; but, as he uses light at one stage of his experiment, his result differs from mine, and is not accepted by M. Niepce's advocates as a solution of the controversy. My experiment is, I take it, a simple repetition of M. Niepce's, minus the disputed agent, the light. I am still investigating further the exact physical and chemical causes of the varied phenomena which have so long perplexed us. I may perhaps be permitted to say that I regret that I have not been able to confirm the conclusions of one to whom we are so much indebted for the introduction of albumen into photography.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

There is perhaps no part of the work of a critic so easy as that of fault-finding, and, if he be so inclined, he may generally indulge the propensity, even with justice. To discover entirely the original idea which inspired the artist when producing his work is by no means so simple an operation; because, even if we set aside the possible variation in capacity for apprehending any given idea, it rarely, if ever, happens that the hand of even the most skilful has cunning enough to give full expression to his meaning. It is manifest that this observation does not apply to faults of conception, but to faults of execution. In general, defects of both kinds are found to exist in nearly every work of art. As the demands upon our space are large, especially at the present moment, and consequently the portion which we can devote to our own remarks but small, we purpose, in the few observations which we are about to submit in reference to some new compositions, endeavouring rather to draw attention to a few of the beauties which undoubtedly exist, than to enter into any lengthened analysis.

At the October meeting of the North London Photographic Association we were enabled, by the kindness of the artist, to lay before the members a copy of Mr. Henry P. Robinson's last new composition photograph, entitled "The Holiday in the Wood"—a work which he has had in preparation for many months past, upon which he has expended no small amount of labour, both mental and physical, and which, though possessing some faults, is one that will deservedly earn a large share of commendation. The dimensions of the picture are about 21 by 16 in., and it contains ten figures of considerable size, very gracefully and effectively grouped. The attention is immediately arrested on first glancing at it, and it is not until some time has elapsed that the spectator becomes aware that it possesses any weak points.

The scene is a moderately clear space in a wood, where the ground is uneven, and rises into a little bank—just such a spot as a party of children are sure to select for their playground. Seated upon the bank, a girl is busy making a garland of wild flowers, while another leans against her shoulder, looking on at the work. On the other side is one reclining in an easy attitude, and with a mirthful (perhaps too mirthful) expression depicted, as if enjoying the serious way in which a little child seated in the foreground is being decorated with a wreath of convolvoluses by an elder girl. The child's lap is full of lilac blossoms; and on the right hand two more little ones are seen approaching from the distance. These last-mentioned figures are somewhat too near in fact; but we have no doubt that by a little judicious management they can in future specimens be thrown further back to the eye. In the upper part of the left side of the subject a girl, with the skirt of her dress pinned up behind and right arm raised with her hat in her hand, is chasing a butterfly, while a companion at her side and a boy in the foreground are both intently watching the issue of the chase. The figure of the little huntress, whose back is towards the spectator, is extremely well designed and full of action. Some of the outlines are a little too hard. There are one or two defects from distortion, and we have admitted that some few other faults are also apparent; but, upon the whole, Mr. Robinson has done much in carrying out a happy idea, while some of the existing drawbacks are remediable in future impressions.

PHOTOGRAPHERS THEIR OWN ARTIFICERS.

By Thos. Gulliver.

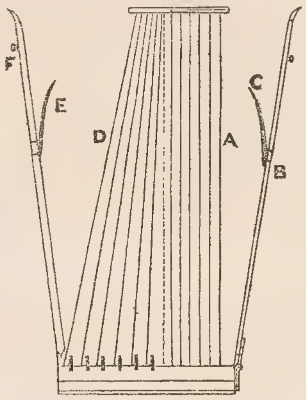
No. IV.

Improved Plate Box; Double Stereo-Camera without Dark Slide; and Improved Washing-tray.

During the past season I have constantly used the tent described by me in No. 104, October 15th, 1859, and in that time have taken upwards of 200 negatives and positives, and found it the most portable and convenient of any that have come under my notice. It has been my aim, as much as possible, to reduce the weight of the apparatus and get rid of every superfluity.

The washing-bath, with its 14 oz. of liquid, I have superseded by a light washing-tray, 9 in. long by 6¾ in. wide, and 1 in. deep inside. This requires only 7 oz. of syrup, and after washing over the plate the syrup is returned to a wide-mouthed bottle; and the 7 oz. of syrup is sufficient to wash and preserve half-a-dozen plates 8½ in. by 6½ in.

In lieu of the usual plate boxes, I have made one box that occupies but little space, and is very light. I have at present one made of wood, but intend soon to have one made of metal, in this form:—



The front compartment A will contain six plates, ready cleaned for use: they are kept in place by the spring C, and shut in clear from dust by the hinged lid B, which has a slight rim turned round the edges. The other part of the box is for the negatives when removed from the syrup bath. They are reared against the middle of the box, and two small brass points near the top keep the plates from injury: they are kept in place, at the bottom, by small brass pins about ½ in. high, at regular intervals. The lid or shutter F is not hinged, but dropped into a groove, and is fastened by a brass button. The spring E keeps the plates in place, and they travel safely, and thus all the risk of rubbing the film by sliding the plates down a groove is done away with. The bottom of the box is double, and all draining from the plates runs out at a small hole in the corner. The box would also do for dry plates, but I never use such things now.

Another encumbrance I have done away with is the dark slide and focussing frame of the camera: thus more weight than is necessary is avoided. In the old Daguerreotype times a narrow dark slide did very well, as all was to be kept as dry as possible, when collodion was made, and still continues to be made; hence a great variety of stains and failures in working wet collodion plates arose from this defective form of dark slide.

The late Mr. S. Buckle, of Leamington, made his cameras and dark slides suitable for the collodion process. The slides were about 1¼ or 2 in. thick: this allowed enough room for the wet plate to be clear of splashes. The plates themselves rested on three wood points. The sliding shutter ran in a groove about ¼ in. wide. The shutters were the same thickness: this did well for the portrait room, but for landscape photography my advice is, use no dark slide at all. I have now used a double stereo-camera all the season, and found it far more convenient than the usual form of camera. Thus there is less danger of admitting light; there is less time required to take the view; there is no need of covering the camera with the focussing cloth, so the wind has less effect upon it; the plate is certain to be in the same plane as the ground-glass; and last, but not least, there is somewhat less weight to carry.

A SIMPLE AND EFFICIENT PRESERVATIVE PROCESS.

By John Sebastian Davis.

[Read at a Meeting of the South London Photographic Society, October 15, 1860.]

The glass plate is to be covered with a good negative view collodion, and excited in the usual thirty-two grain nitrate of silver bath. Upon its removal, the free nitrate of silver is to be washed away, with an abundance of filtered river or rain water poured over its surface. The film is then to be covered with a preservative solution, containing a mixture of grape sugar, gum, and diastase, as naturally mixed in the dried grape. It is to be extracted by the following method:—Take four ounces of stoned plums, and mix them with an imperial pint of boiling water; as soon as cold strain through fine muslin; and, finally, filter through ordinary filtering paper. The washed plate is to be covered twice or thrice with fresh quantities of this extract, and afterwards gently washed in an upright bath, or in any other convenient manner. The object of the latter process is to remove the greater portion of the preservative solution from the surface of the film, without disturbing that which is retained within its interstices. The development is to be effected with—

Pyrogallic acid	1½ grains,
Citric acid	½ grain,
Water	1 fl. ounce,

previously mixed with twenty minims of a sixteen-grain solution of nitrate of silver.

The usual photosulphate of iron fluid is somewhat to be preferred in cold weather; but the negative will require to be slightly intensified with the pyrogallic developer. It is to be fixed with hyposulphite of soda, dried with a gentle heat, and varnished.

PHOTOGRAPHIC ENGRAVING OF BLOCKS, TO BE PRINTED WITH ORDINARY LETTERPRESS.

The Invention of Mr. Paul Pretsch.

We have had the pleasure of presenting our readers, in the last number of this Journal, with one of the first blocks produced by the above-named process. It was printed by steam with ordinary letterpress. However, for the sake of making the advantageous application of this process more striking to the public, we have now inserted one of these blocks amongst the types themselves.

The process consists, as already stated, in a combination of photography with electrotype. Photography furnishes the engraving of the picture in the proper and desired effect. It appears wonderful how Nature can be used and guided (it can never be compelled) to meet the requirements of technicalities—to produce the engraving just in the very same style as it is wanted. An experienced engraver, examining some of these blocks, may be misled in his judgment, and believe that some portions of them have been executed by the graver, or by some other assistance of the human hand.

The engraving produced by photography is not solid, but is transient; consequently it must be transformed into something solid, to print from. This is done by the means of moulding and electrotyping, resulting in a solid block—the face of copper, backed with type metal, and mounted on wood in the usual manner.

Our readers will easily perceive that all originals which are serviceable to photography can be used for reproduction by this process; consequently almost every subject of art or nature can be transformed into a block for ordinary letterpress, without the interference of a draughtsman or engraver. Therefore, the real touch of the artist, or the true finger of nature, will be preserved and reproduced. Science and art, the faithful followers of nature, will receive authentic illustrations, and the influence of the press, already in active power for general distribution of knowledge, will be increased. Experience and time will very soon bring to light the results, to be seen in our books, periodicals, and newspapers.

Printing from blocks by ordinary letterpress cannot be surpassed in cheapness and rapidity by another mode of printing; it is, therefore, literally the art for the million. However, for high works in the fine arts, where a few thousands of copies only are required, there is still Mr. Paul Pretsch's first process available, in which are used similar means, and results in the production of an engraved copperplate, which can be coated with iron, and printed with the usual printers' ink on the ordinary copperplate printing-press. This is called *Intaglio Printing*, contrary to the explained process of printing from blocks, or *Surface Printing*. We hope and wish that both processes may be cultivated and applied in the most extensive manner.

DOVER CASTLE.

PHOTOGRAPHED FROM NATURE BY FRANCIS BEDFORD.

Printed with ordinary Letterpress from a Block produced by Photography and Electrotype, absolutely untouched by the graver. The invention of Herr Paul Pretsch.

STEREOGRAPHS.

Picturesque Scenery of the Highlands of Perthshire, by WILLIAM RODGER, *Montrose.*

> "Then slowly climb the many winding way,
> And frequent turn to linger as you go;
> From loftier rocks new loveliness survey."
>
> *Byron.*

THERE are perhaps few localities that have been more frequently explored by the disciples of the camera than the Highlands of Scotland; and we may add that there are few that have had more justice done to the enchanting spots with which they abound. Some of our best operators are natives of the northern section of our island, and the proverbial *amor patriæ* may possibly have had something to do with the extra, we had almost said filial, care with which the more charming lineaments of their beloved land have been delineated by them. In July last we noticed some of Mr. Rodger's Tweedside views: we now come to some of his Perthshire studies. Along most of the valleys traversed by the numerous mountain streams in Scotland, the otherwise stern and rugged rock is generally clothed with a mass of fir-trees and other gymnospermous specimens of vegetation; and it is no doubt owing to the constant humidity of the atmosphere, produced by the spray from the numerous "falls" with which these streams abound, that vegetation flourishes in places where the soil would appear to be but scanty.

There is a peculiar character about most of the Scotch valleys that stamps them with an impress almost unmistakeable, although there is no more sameness than we notice in the various members of one family; and while each one possesses an individuality it is not the less distinguished by a distinct nationality.

THE UPPER AND LOWER FALLS OF BRUAR (Nos. 23 and 25) exhibit this nationality in a marked degree. In the former the deep ravine, with its steep rocky sides, is almost entirely concealed by the thick plantation of fir-trees, across the feathery tops of which the sunlight glances, gilding each with an artist's touch, while the little stream leaps from step to step of its rocky bed like a child just loosed from school. In the latter the waters have worn a deep chasm in the hard rock, in a zig-zag form, while here and there it has fairly forced away the softer subsoil, leaving a natural arch, through which it pours its ever-ceaseless stream.

THE UPPER FALLS OF MONESS, BIRKS, ABERFELDY (No. 15), is one of those scenes which once visited can never be forgotten; nor have we forgotten this, albeit we have never visited it but by Mr. Wilson's aid on a former occasion. From beneath a rustic footbridge, on which a couple of spectators are to be seen, the stream shoots out over the dark stratified rocks, breaking quickly into a light veil of foam. Here, besides the pines, we have beech and birch trees, and other frequenters of more sheltered haunts than are to be found amongst most of the Scottish hills. This is a very beautiful slide.

Of THE SECOND FALLS OF MONESS we have two illustrations (Nos. 16 and 17), each gems in their way, the former being conspicuous for the gracefully drooping branches of some gigantic fir-trees, between which the waters of the "fall" are seen in the distance, the latter for the elegant broken curve of the stream as it foams along its step-like bed.

THE HERMITAGE BRIDGE ON THE BRAUN.—This is a spot which we well remember having spent some hours at; and, although we were not fortunate enough to see it in its summer luxuriance as here depicted, yet the loss was not all uncompensated, for the rush of waters from the melting of the winter's snow was unusually fine. This is a spot which the following lines from *Childe Harold* well describe:—

> "The roar of waters!—from the headlong height
> Velino cleaves the way-worn precipice;
> The fall of waters! rapid as the light
> The flashing mass foams, shaking the abyss;
> The hell of waters! where they howl and hiss,
> And boil in endless torture; while the sweat
> Of their great agony, wrung out from this
> Their Phlegethon, curls round the rocks of jet
> That gird the gulf around, in pitiless horror set,
> And mounts in spray the skies, and thence again
> Returns in an unceasing shower, which round,
> With its unemptied cloud of gentle rain,
> Is an eternal April to the ground,
> Making it all one emerald. How profound
> The gulf! and how the giant element
> From rock to rock leaps with delirious bound,
> Crushing the cliffs, which, downward worn and rent
> With his fierce footsteps, yield in chasms a fearful vent
> To the broad column which rolls on and shows
> More like the fountain of an infant sea
> Torn from the womb of mountains by the throes
> Of a new world, than only thus to be
> Parent of rivers, which flow gushingly,
> With many windings, through the vale!"

The views from below (No. 3) and from above (No. 7) are both equally beautiful, though in neither of them is the "fall" itself, which recalled the preceding lines to our memory, seen; so vividly, however, did these stereographs remind us of the spot, that instantly the recollection of the surging waters rushed upon us in all its original freshness. The best view of the waterfall is from the window of a small building called the Hermitage, which confers the designation on this "fall" to distinguish it from another about a mile and a half higher up the stream, near to what is known as THE RUMBLING BRIDGE, of which also we have two illustrations (Nos. 9 and 10); and in viewing these we are again delighted with a flood of pleasant memories. A very ordinary-looking bridge of one small arch spans the chasm like an awful "gash" in the black rock, through which, deep down, the water hisses and boils, a small portion of it being visible in No. 10. In our opinion the best view of this spot is obtainable from the other side of the bridge; but to take it involves a rather "ticklish" bit of climbing, and the "perch," when reached, is none of the safest, being covered with a treacherous, slippery kind of moss, as we know from experience, having planted our camera thereon, somewhat to the dismay of our Scotch friend, who thought our lowland legs unfitted for the work, and felt responsible for our safety.

The best view of the "waterfall" is from a spot which we reached, also, in our friend's absence, but where it would be in vain to expect to plant a camera—being a rock in the middle of the stream, and which is only to be reached by some dexterous gymnastics, and when there, one is very speedily soaked to the skin by the copious spray which is thrown up. When at this spot we witnessed the magnificient effect of a brilliant rainbow, which appeared to form a nearly perfect ellipse from where we stood. It must not be forgotten that we are on classic ground, being in the immediate neighbourhood of "Birnam Wood," alluded to in *Macbeth*.

No. 2 is a view of DUNKELD from the old trees of Birnam. The bridge across the Tay, the old Cathedral, the principal part of the town, the finely wooded hills belonging to the Duke, are all included in the picture.

DUNKELD CATHEDRAL is a ruin possessing no particular architectural beauty; but, overgrown as it is with ivy, and taken with its picturesque surroundings, it is a very attractive subject for the photographer. We scarcely think Mr. Rodger has been as judicious as usual in his selection of a point of view with regard to this slide—not, however, that we have aught to object to what is before us, but we remember to have found a better one, close to a summer-house on the further side of the bowling-green, in the Duke's ground, from which not only the whole of the cathedral is included, but in addition a couple of magnificent trees, which add much to the artistic value of the subject.

BISHOP CARDNEY'S TOMB, in Dunkeld Cathedral, is admirably rendered, in a style to give satisfaction to the artist as well as to the antiquary. Being unaquainted with the correct antiquarian "slang" in which to describe this particular kind of tomb, we can only state that it consists of a slab, on which reposes the time-worn remains of a recumbent sculptured figure, in an arched recess in the wall of the edifice. On the left is a gothic window, destitute of glass, through which the stem of the ivy has found an entrance from the outside, the branches of which serve to adorn the mouldering walls. The floor consists of a few flat stones recording spots sacred to some memories, now, alas! no longer remembered, between which the rank grass and a few small tree-shoots find their way towards the light. On the left is a stone pillar possessing no beauty of its own, but glorified by the chequered sunshine streaming in from the opposite window.

Such are a few of the beauties of Bonnie Scotland—a most appropriate designation by the way—to which Mr. Rodger introduces us; and, whether regarded as records or as works of art, they are equally interesting.

INSTANTANEOUS PHOTOGRAPHY AND COMPOSITION PRINTING.

[Read at a meeting of the South London Photographic Society, 15th November, 1860.]

By SAMUEL FRY.

IN the midst of our discussions on dry processes—the failure of one, the success of another, and the peculiarities of a third—it may not be amiss to halt a moment and consider certain advantages pertaining to the wet collodion process in its most sensitive form. I consider it an error of judgment on the part of those who would utterly repudiate either method of manipulation in favour of the other, as each has, beyond doubt, great and manifest advantages for its own class of subjects; and I trust to be able to show you this evening, to your satisfaction, that whilst, as at pre-

sent constituted, wet collodion has unquestionably the most rapid action, and produces more atmosphere as a rule, that it is far from hopeless to expect that ere long we may be able to prepare dry plates capable of producing all that wet collodion now does.

I have also in view, in troubling you with this paper, to impress on photographers the primary importance of introducing artistic feeling and true *chiaroscuro* into our landscapes, &c., rather than making that incubus of the art, sharpness, take the pre-eminence.

The mass of chalky white sky is a great fault in a fine landscape, and I have brought a few specimens to illustrate the improvement easily obtained by the very simple operation of printing in a cloud sky from a second negative. I will also explain the method I adopt of taking from nature these cloud negatives, and adjusting them to various subjects.

I may perhaps commence by describing the chemicals and apparatus used by me for taking instantaneous stereoscopic and other negatives of the waves of the sea, copies of which are now in the stereoscopes before you, and also other large pictures on the table.

In making the bath I use crystals in preference to fused nitrate of silver, and choose always a sample which has no perceptible odour of free nitric acid, as that would of course tend to retard the action. I consider the bath should certainly be of the strength of forty grains to the ounce, and I have frequently, with advantage, used it with as much as fifty, but there is with this strength a considerable inclination to attack the plate when kept for more than five minutes. I keep this bath carefully neutral, in fact, I have frequently, adding acid in proportion to the developer, had it with a slight alkaline reaction; but I do not recommend it in this condition, as being most difficult to manage, the slightest *soupçon* of diffused light in the camera or dark-room being enough to cause fogging. The collodion I prefer is that sold for positive photographs, and there are so many excellent makers in the market that it would be invidious to specify any particular maker; but I strongly suggest it should be mixed not more than a week before using. Negative collodion may of course be used with perfect success, but most samples so rapidly lose their normal sensitiveness that I have found more difficulty in obtaining the best results with it than with positive. Of the pictures now before you, the one taken with the shortest exposure is that numbered 2, the ground-swell, in which the breaking wave has thrown water high into the air, each transparent drop being accurately rendered in the photograph, and was done with Mr. Hardwich's collodion from a sample he prepared expressly for me; but the same collodion failed to produce an equally good result when mixed twenty-four hours, and I may say that having tried the negative collodions of the best makers, I am inclined for this special work to prefer a positive one, as being thinner, and thus giving a peculiarly smooth, even film, free from spots and blemishes, and, above all, more sensitive when developed with iron, which I generally use. It will occasionally occur when the light is not particularly brilliant that an iron negative will refuse to gain intensity on applying the subsequent negativing pyrogallic solution; but such is not, I think, frequently the case: when it is, I have used, with much success, first a saturated solution of bichloride of mercury, and when equally whitened, wash and use a weak solution of hydrosulphide of ammonia, which gives a yellow image possessing much more printing power than a cursory inspection would lead one to suppose. Samples of such negatives are on the table, though in these the final solution of hydrosulphide of ammonia being too strong, they are almost too dense to print well.

A binocular camera is on the table which has the interior arrangement of shutters I prefer and use for instantaneous work: by the slightest imaginable movement of finger and thumb the exposure is achieved. I am a sceptic with regard to those fabulously small fractions of a second in which some would have us believe exposures are made and pictures taken, as I find much rougher methods of exposure even than those before you perfectly practical in taking objects in motion. In a recent letter from Mr. Wilson, of Aberdeen, whose charming works we all know, he tells me he covers his lenses with his own Scotch cap, and simply lifts it off and on again. If such simple means are so successful for obtaining good pictures, surely there can be no advantage in having any of the costly and complicated affairs which have been recommended in the way of sliding shutters, which are almost certain to stick at the critical moment from damp, or else they shake the camera in moving.

I have invariably used a pair of double lenses, made for me by the late C. Shepherd, and think them equal, at least, to any made by far more expensive makers.

I place a stop of 3-16ths of an inch between the lenses, which will bring foreground and horizon into perfect focus.

The iron developer I use is—

Iron	20 grains.
Ac. Ac. Beaufoy	1 drachm.
Ac. soda	1 grain.
Aq. dist.	1 oz.

I pour a considerable body of this in one sweep over the plate, and let it develop the picture as far as it will, sometimes adding a few drops of a fresh solution of nitrate of silver, not having any iodide in it. I then carefully wash the plate with a good stream of water, and proceed to densify with

Pyrogallic	3 grains.
Ac. Ac. Beaufoy	1 drachm.
Water	1 oz.

or—

Pyrogallic	3 grains.
Citric acid	1 grain.
Water	1 oz.

As a general rule, I can at once obtain sufficient density on adding a few drops of the above-named solution of new nitrate of silver; but when it fails I use, as hinted before, the bichloride of mercury, followed by hydrosulphide of ammonium.

I conduct the intensifying in daylight, but not in strong light.

I will now speak of three small paper photographs before you, representing sea, and clouds, shipping, &c., also moving figures on the land: these were done with dry plates, prepared by Taupenot's method. I wish I could say they were by Fothergill, which I must prefer for its certainty of result and simplicity; but I confess I have not yet succeeded in producing quite the same degree of sensitiveness in this latter, though from recent experiments I am persuaded it is to be done, and intend next season to pursue it. They perhaps scarcely fulfil the desired conditions of instantaneity, being done with a ¼ Ross lens, double combination, and stop of two inches; but the exposure was undoubtedly sufficient, and proves that more is to be done in that direction. The clouds are printed in four different negatives, and add very greatly to the general effect; and I will now describe the means I use for taking the cloud negatives, some of which are in the room.

If for the previous operation the highest possible sensitiveness is required, here we have the very reverse, and I therefore use old port-wine-coloured collodion, an acid bath, and a long focus landscape lens, and a weak developer. The exposure is generally nearly instantaneous, and it suffices perfectly to cover a cloth over the lens and lift it during exposure.

To develop I use half a grain of pyrogallic acid, 1 drachm of acetic acid, 1 oz. of water, and bring it up very slowly: by this means very admirable clouds are produced, possessing wonderful half-tones, and yielding every shade from intense white to black. I usually take the cloud negative not larger than 5 × 4, then print a transparency on a Fothergill plate, and enlarge that up to 18 × 15. In the enlargement it gains in detail, and acquires exquisite softness and beauty, and from a negative of that size may be printed different skies into twenty or fifty other pictures: each portion of sky may, by judicious printing, be made to yield different characteristics suitable to the subject to which it is joined.

I will in a few words explain my method of composite printing, as shown in the circular picture, *The Break in the Clouds*, and also *The Heavy Sea at Brighton*, now before you: the latter picture is printed from three negatives, which I have here. The first to be printed is the foreground of boats, and whilst this is in the frame, a mask of cardboard, cut roughly to the shape of the upper edge of the negative, and edged with cotton wool, is laid outside the pressure frame, over that part of the prepared paper which is intended to be kept white: the frame with the mask in it is then placed in diffused light. To examine the printing, I invariably bring the frame into the dark room, or the pure white of the picture will be degraded: when this part is sufficiently done, I take the sea negative, and which has a light paint mark on the lower part, corresponding with the outline of the previous plate. The plate being laid on the paper in proper position, as shown by this line, has two masks superimposed on it: the lower one covers the part already printed, and the upper that reserved for the sky. Again the frame is exposed to light until the central strip of sea is printed; then the cloud negative is placed on the paper, and a mask covering both the lower parts is placed in position. The operation is much more simple in reality than in description; and, if ordinary care be taken, no part of the picture can overlap the other. By this means highly artistic effects are produced, such as can scarcely be obtained in a simple negative. I will now say a few words with respect to printing clouds into architectural and landscape pictures, which I do by making lightly on the back of the cloud negative a line corresponding with the outline of the picture: the two are then placed in the frame, and a mask placed over the landscape or building already done; the cotton wool at the edge of the mask and the thick glass of the pressure frame combine to prevent any hard line round the picture.

I have to thank you for the kind attention which you have given me; and though there are many present to whom anything I have read to-night must be perfectly well known, still I trust that the discussion raised upon points I have alluded to may not be without its advantages.

A PHOTOGRAPHER'S HOLIDAY IN DERBYSHIRE.

By D. W. Hill.

[Read at the Meeting of the North London Photographic Association, October 31, 1860.]

It has more than once been remarked, that in the absence of any definite instruction in matters photographic, a mere detail of the failures, successes, and experiences generally, of almost any photographer, will always furnish material for profitable discussion at our meetings; and, understanding that there is no more important subject to engage your attention this evening, I have been induced, at the suggestion of one of our members, to lay before you a short account of my own fortunes while seeking a renewal of health and recreation in Derbyshire, during the month of July, in the present year—a selection of time which I cannot but regard as fortunate, seeing that the almost uninterrupted wet

weather of necessity almost put a stop to photographic operations, out of doors at least, while the first fortnight of the month in which I took my holiday proved as fine as could possibly be desired.

I started on the 5th, taking with me my stereoscopic apparatus, and Burfield and Rouch's dark box, with a good supply of chemicals for the wet process. Just before arriving at Matlock it began to rain, but cleared up in the evening, and remained fine for ten successive days. In order not to lose any time I commenced operations the next morning after my arrival; and as I had not previously used the dark box, I had to familiarise myself with the method of working in it.

The weather being warm, I found much difficulty in developing when employing Ponting's collodion, as I could not cover the plates evenly before the action commenced, although I increased the amount of acetic acid. But Bolton's collodion I found worked admirably; it developed slowly, evenly, and without fogging—a quality which accounts for its being so much esteemed in Natal and India. In cold weather I prefer Ponting's, or a mixture of that with Bolton's.

I found the dust very troublesome, and was obliged to keep the inside of the box damp. After the first day's experience I rarely failed in getting clean negatives; and I can strongly recommend those who very naturally object to being suffocated in a tent to try one of the boxes introduced by Messrs. Burfield and Rouch.

Matlock and its neighbourhood contain, within a small compass, more good subjects for the camera than any place with which I am acquainted: you cannot go a dozen yards without seeing something worth taking. It consists of three portions—Matlock Village, Matlock Bank, and Matlock Bath. The village has no particular object of interest but the church, which is decorated (!) with a very grotesquely-painted ceiling.

The Bank is identified with Mr. Smedley's hydropathic establishment, which is decidedly not ornamental, resembling outwardly a workhouse or factory. The walk from the "Bank" to the "Bath" is, however, most lovely. After crossing the bridge, some bold masses of rock, called "The Church Rocks," first attract your attention. Following the course of the river Derwent you come to the railway bridge, from which there is one of the finest views of Matlock Dale. Leaving the Boat House Inn on the right you come to some quarries, one of which requires some caution in passing, as, from the careless mode of blasting adopted by the workmen, large blocks of stone are frequently blown across the road into the river. At the back of the Boat House the rock is almost entirely composed of fossils (some of which are very fine), and is used for making mantelpieces and the other fire-place appendages. Close to this spot I took a picture, including quarries, boat-house, bridge, &c., with Matlock Bank for the background.

A little beyond this is a tollbar, from which a splendid view of the High Tor, the most striking object in the immediate neighbourhood, is to be obtained. It is a stupendous rock, 400 feet high, rising almost perpendicularly from the water's edge, and covered for two-thirds its height with trees and underwood in picturesque confusion. I took several views of it from different spots. Nearly opposite is another hill, called Masson *Low*, which is, I believe, the highest ground about Matlock, and is nearly thrice the height of the High Tor, being 1160 feet above high-water level.

About half a mile farther on from this spot the road takes a sudden turn to the right, and brings you to Matlock Bath, with its villas studding the side of the hill—the caverns, obelisks, church, lovers' walks with their rich masses of foliage—affording subjects enough to satisfy the most enthusiastic follower of our art. The scenery between this and Cromford is very fine, but, in my opinion, not equal to the other side. Near Cromford is Willersly Castle, the residence of Mr. Arkwright, which is very beautifully situated. Going through Cromford, I took a steep footpath which led to a miners' village, called Bonsall. On a fine day many very pretty pictures of the "hollow" might be taken; but on the day when I was there a mist obscured the distance; so I only tried two, which would have been much better but for that cause.

From the unusual curiosity shown by the people at Bonsall, I should think it had not often been visited by a photographer. I was quite mobbed, and prevented taking many pretty spots which I had selected. I succeeded, however, in securing the old Market Cross—a pillar, dated 1678, resting on a base formed by an ascent of ten steps.

When the children saw what I was about, they crowded up the steps, and I made an attempt to take them in that position, but just as I had uncovered the lenses, an unfortunate rat running across the road caused the whole of them to start in pursuit. While I was occupied in taking the Cross, a lad, who accompanied me to assist in carrying my apparatus, amused himself by inducing some of the boys to dip their fingers in the waste developing solution and then rub them on their noses, which under the influence of the light soon assumed a piebald appearance, decidedly more comical than elegant, and no doubt astonishing to their affectionate relatives, for I rather imagine they were puzzled to get the stains off. On another occasion, as I was fixing a plate, my factotum informed some people that I was "taking the scum off," fancying, of course, that in his "distinguished" position it would not do to appear ignorant of the object of any of my operations.

Having become tolerably accustomed to my box, I one morning took the train to Rowsley, and from thence proceeded to Haddon Hall, which is considered one of the finest and most perfect specimens of an ancient baronial mansion in existence, and forms a marked contrast to Chatsworth, which represents the modern style. Both places are generally visited on the same day.

Haddon Hall is situated on an eminence, on the banks of the Wye, and is seen best when approached from Rowsley; it belongs to the Duke of Rutland, and, though not inhabited, is kept in good repair.

Having secured six or seven negatives, I made way for a gentleman who had a small cistern about four feet square, mounted on wheels, for a dark room. He also was taking stereoscopic pictures.

I then proceeded to Bakewell to take the ancient Saxon Cross in the churchyard. In the church, which is a magnificent structure, are some very curious Druidical and Saxon remains, large numbers of which were found when the church was renovated. There are also some very handsome monuments to the memory of members of the Vernon and Manners family, which I should have attempted but for the circumstance that Divine Service was being performed.

While looking for the best point of view, I stumbled on two epitaphs, which I will venture to repeat. The first was to a defunct parish clerk, and had the following lines:—

> "The vocal powers, here let us mark,
> Of Philip, our late Parish Clerk.
> In church who ever heard a layman,
> With clearer voice say Amen?
> Who now with Hallelujah sound,
> Like him, can make the roofs rebound?
> The choir lament his choral tones;
> The town, so soon here lie his bones.
> Sleep undisturbed within thy peaceful shrine,
> Till angels wake thee with such notes as thine."

The other was as follows:—

"Know posterity, that on the 8th April, in the year of grace 1757, the rambling remains of the abovesaid John Dale were laid on his two wives.

> "This thing in life might raise some jealousie;
> Here all three lie together lovinglie.
> But from embraces here no pleasure flows,—
> Alike are here all human joys and woes.
> Here Sarah's chiding John no longer hears,
> And old John's rambling Sarah no more fears:
> A period come to all their toylsome lives;
> The old man's quiet—still are both his wives."

On the following day I went to Chatsworth, the seat of the Duke of Devonshire, which I shall not attempt to describe, as to form an idea of the magnificence of this Palace of the Peak, its contents and grounds, it must be seen. I was not so fortunate as on the previous day. A thick fog came on and increased till I could see nothing on the ground glass. I had, however, taken a view of the bridge, with a portion of the mansion beyond, and one of the entrance gateways, when I was obliged to give up, and went to see the model village of Edensor, which consists of an old Gothic church, handsome fountain, and cottages built in the Elizabethan, Swiss, and almost every style of architecture but the one usually adopted by villagers.

My last trip was to Wingfield Manor. The morning was dull, but not sufficiently so to deter me from going. When I arrived at Ambergate, it rained heavily, and only held up while I walked from Wingfield Station to the Manor, when it poured in torrents, and continued to do so till I left. This was not exactly what I wanted; but having come a long distance, and it not being likely I should have another opportunity, I determined not to go away without some reminiscence of the place. So I borrowed a tarpaulin from the farmer who resides there to cover my box, and set to work, and succeeded in taking seven negatives of objects near, the exposure varying from four to six minutes.

The manor was built in the reign of Henry VI. During the civil war it was twice taken, first by the Royalists, and afterwards by the Parliamentary forces, when it was dismantled. Mary Queen of Scots was imprisoned here for some time; and at the village inn they show a piece of the bedstead supposed to have been used by her. There is a fine old crypt in very good condition, and said to be only equalled by the one at Fountains Abbey, and from the principal tower on the south side there is a very beautiful and extensive view. In fact, I consider it one of the most lovely ruins I ever saw, and, notwithstanding the rain, I was not dissatisfied with my day's excursion.

During the latter portion of my stay it rained almost incessantly, preventing my going to Dove Dale, Lea Hurst (the residence of Miss Nightingale), and various other places I wished to visit. However, if every one has had as pleasant a trip this summer as I have enjoyed, they will not have much reason to complain.

I usually took with me two three-ounce bottles of collodion, six ounces developer, four ounces cyanide solution, a gutta-percha bottle holding a quart of water, a smaller one for rinsing the plate before fixing, two pneumatic holders, one dozen plates in light box with wide grooves, and gutta-percha bath, which was always annoying me by the covers sticking and having to be torn off. I used up three of them. I had a fluted glass dipper, which I like very much, as the plate cannot slip off.

In conclusion, I have only to request your indulgence for any shortcomings of which I may have been guilty in detailing what you may possibly regard as a very commonplace account of my photographic wanderings; my desire being to communicate to you some portion of the pleasure that I myself experienced in the trip, and, if possible, to open up a vein of profitable discussion, whether as regards the respective merits of tents, boxes, dry or wet plates, or anything by which amusement or information may be found. Should I have entirely failed in my attempt, I can only beg you to excuse me, and to "take the will for the deed."

NOTES OF A PHOTOGRAPHIC YACHT VOYAGE IN THE MEDITERRANEAN.

By W. J. C. Moens.

[Read at the North London Photographic Association, 28th November, 1860.]

Having recently returned from a voyage of nearly a year in the Mediterranean, during which time my friend (who had kindly asked me to accompany him in his yacht) and I took photographs in most of the places we visited, and fell in with numerous followers of the "black art," both professional and amateur, I feel it my duty, as a member of this Society, to give you my experience of the enjoyment, difficulties, and troubles, all of which are encountered in turn by the photographer when he leaves his dark room at home—the light and temperature of the country in which he has gained all his knowledge—and goes to wander from place to place abroad, in each of which difficulties arise which must be overcome before he can get satisfactorily to work. This is one reason why, out of the number of travellers who take photographic apparatus with them, so few return with good pictures. Professionals, on the other hand, from residing some time in a place, and nearly always using some dry process, get results which the amateur, in his hurried visit, finds a difficulty in obtaining.

I think it will be interesting to you to know what apparatus we took out with us to work the wet process. Tents I always considered an abomination. Burfield and Rouch's box for the sized plates we proposed using, viz., nine by seven, was so large, and when stowed with bottles, plate boxes, &c., inside, would not bear being shaken up on the top of a Spanish diligence, or slung on the side of a mule or horse, without the breakage of half its contents. What I wanted was a box which, when shut up, would hold my large and stereoscopic cameras, nitrate of silver bath, two dozen glasses, the necessary bottles, &c., and a little box of spare chemicals, and which would be sufficiently strong to bear any description of transport, and not large enough to allow all the contents to be shaken into a jelly.

The box which I have here is one which I contrived after much thought: it was made for me by Messrs. Bolton and Barnitt, of Holborn, who have the pattern. I can strongly recommend it as most convenient for working with wet collodion. It contains all the apparatus required, can be easily carried, and very quickly put up and taken to pieces.

I must now go back to the subject of my paper. We made our departure from the Start at 10 o'clock, p.m., on the 5th October, last year, and steered W.S.W., with a fine breeze, straight for the coast of Portugal. On the 11th, after enjoying all the delights of strong winds and calms, with a heavy sea in the Bay of Biscay, we sighted the Burling Islands, distant about fifty miles from the Rock of Lisbon, for which port we were bound. Fate had ordained that we should suffer all the miseries of a gale of wind before reaching land. We were hove-to for the whole of two days, the wind blowing right into the mouth of the Tagus, which is full of the most dangerous sandbanks, with only two channels sufficiently deep for the entrance of vessels. The clouds and rain rendered it too obscure for us to see the various landmarks necessary for steering our way between the sands, and the sea was so high that no pilots could come off to us. On the morning of the 13th, after two trials, we followed the P. and O. steamer, and were soon flying before the wind, in smooth water, up the river Tagus, which is about the same width as the Thames below Gravesend. We soon passed Belem Castle, the forts of which the French once knocked to pieces, when they paid a visit to Lisbon. We saw a magnificent church a little farther on, and promised ourselves a photographic visit to it as soon as possible. At about two o'clock we arrived at Lisbon, which is a very large city, built on high land, rising from the water. The houses are painted red, green, blue, and white. It has a very noble appearance from a distance; but, when you are close, the houses look mean and poor.

On Saturday, 15th October, the weather appeared more satisfactory, and we looked out our cameras, boxes, &c., and made new nitrate baths. The following Monday it rained all day, so we amused ourselves by cleaning glasses, and getting everything ready to pass the Custom-house. To do this we had to procure about twenty-five signatures to various special permissions, and, besides this, to pay a deposit of about £6 duty, and find security for £50, to ensure of our not disposing of our apparatus in Portugal. A friend in the customs' department kindly assisted us; but even with his aid it was late in the afternoon before we deposited our boxes in the Hotel Central. On Wednesday, the 19th, we rose at half-past five o'clock, with a violent photographic fever on us; got two Galligos (Spaniards from Gallicia, who act as water-carriers and porters to the Portuguese, who are too proud to carry the smallest parcel for themselves), and climbed with our things to the top of the castle St. George, which is the highest point in the town, and commands magnificent views all round. After hard work we arrived at the top at seven o'clock. To our great dismay we found that the Governor would not be up before ten; but, by continually sending up to him, we got permission to take possession of a battery at about half-past eight. We soon got to work: my friend with one of Horne and Thornthwaite's tents, and I with my box—each having one of the yacht's men to assist us. We found the light so intense that it gave us a great deal of trouble, and we were not very well satisfied with our morning's work.

I commenced with forty seconds' exposure, and found that twenty was sufficient, the focal length of my lens being about fifteen inches. We obtained water from a Galligo, who delivered over a barrel and contents for the sum of threepence, engaging to fetch the barrel when we had done with it. I found the "legs" of the dark box rather too long; so, on returning on board, I shortened them with the assistance of our carpenter.

On the 23rd we started for Cintra in a carriage—a drive of about fifteen miles. The first part of the way was very uninteresting: the fields were quite bare, the only vegetation being hedges of aloes and prickly pears, and a few dusty olive trees. The leaf of this twisted, ragged tree is very like that of a willow, but rather shorter and darker. The mountains on which Cintra is situated look very imposing as you approach them, covered to the top with firs and cork trees, and crowned with castles. We put up at the Victoria Hotel, which is kept by an Englishwoman; and the next morning got up early, procured a donkey with a large pannier on each side, in which we packed our paraphernalia, and began to ascend the mountain. Half way up we took pictures of the *Moorish Castle* and *La Peña Palace*, which bear evidence of the Mahomedan rule in this country. We then went to the top, and took sundry other views, whose only recommendation was their beauty; but this was the first and last time we took pictures unless they had something special to recommend them. The light was much more manageable to-day, and we got on pretty well, the exposure being from a minute to a minute and a-half, or about three times as long as at Lisbon: there was some amount of moisture in the air here, which I always found made a great difference, so much so, that I frequently used to consult the barometer before starting. The view from the tower of the Palace was exceedingly beautiful. All round the mountains in the foreground are covered with fir and cork trees, with enormous boulders of stone scattered *everywhere about*. The country below is spread out like a map: in the north, mountains in the distance bound a fertile plain; in the west you see Fort St. Julian, the mouth of the Tagus, with the waves rolling in from the Atlantic, breaking on the bar, and farther on the coast line, terminating with Cape Espicial; and to the east the vast city of Lisbon, and beyond that the mountains of St. Ubes.

The next day we telegraphed for a carriage, and got back to Lisbon at eight in the evening, delighted with our trip. On Wednesday morning we printed the pictures we had taken, and in the afternoon rowed down the river to Belem, in order to take the church we had noticed when sailing up the Tagus. It was that of St. Geronimo, built in honour of the discovery of the Cape of Good Hope, by Vasco de Gama: the sacristy and cloisters are particularly beautiful. We soon found out that buildings are far easier to take than distant views. It was a fine clear day, and the exposure at half-past three was one and a quarter to one and a half minutes.

On Friday, the 28th October, having got tired of Lisbon, we paid farewell visits to our friends, and sailed for Cadiz. We passed the bar at half-past three—a very different scene to what it was when we entered—the water quite smooth, and a fleet of thirty or forty little fishing-boats, looking very quaint, with their outrigged sails of every size and shape sticking out all round them; some had even square sails at the end of their bowsprits. We soon got out into the long north-west swell, which we did not lose till we rounded Cape St. Vincent, when the Atlantic, nearly always in a high state of commotion, became as smooth as a duck-pond, with hardly a ripple on it. On Monday, the 31st, we cleaned glasses, which was always a source of amusement when wearied by the monotony of a calm. We sighted Cadiz in the evening, and the next morning brought up off the town. There was nothing very particular to photograph there; and, not being able to find an interpreter, we sailed the next day for Gibraltar. As soon as we had passed the ever-memorable Bay of Trafalgar, we stood over to Tangiers, which the Spaniards were blockading: the Vulture and a French steamer were in the Bay, and the Spanish gunboats were firing at the Moorish forts. The mountains on each side of the Straits looked magnificent. The rock of Gibraltar is not visible till you have passed Tarifa Point. The wind was very light, which prevented our getting in till the next morning, when, having been woke early by the captain, a splendid sight was presented to our eyes. On coming on deck we found ourselves in the middle of the English fleet, consisting of eleven ships of the line, besides corvettes and gunboats: their boats were rowing about in all directions, with pretty little midshipmen in charge. We found we were allowed all the privileges of a man-of-war, and moored close under the new mole. But to our great horror we discovered that photography was strictly forbidden at Gibraltar, Sir William Codrington telling us, on our applying for leave, that if he allowed us, the French and Spanish consuls would immediately have particular private friends for whom *they* would wish to get leave, so that he felt obliged to refuse us.

We went over the galleries with Mr. Lee, R.A., who was also a photographer and a friend of the Governor's; but he too had to forego his pictures. The town was full of refugee Jews from Tetuan, to the number of some thousands: the greater number were encamped on the neutral ground, and had rations of meat and bread found them by our government. They were tall, fine men, not like the members of their race here, but with fine regular features, and the women very good-looking, with very picturesque costumes, many wearing the burnous. We spent a pleasant fortnight here, meeting with all the hospitality for which our military and naval stations are so renowned. During this time we rigged up another dark box for my friend, who found his tent too inconvenient from the heat and wind.

(To be continued.)

Letters to a Photographic Friend.

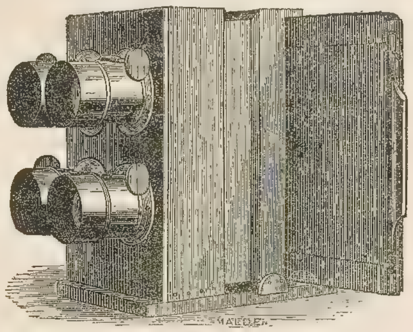
No. IX.

My dear Frank,

I have now to tell you of the novelties that came under my notice on the day that I took my last glance at matters photographic in and about London, and also to answer the questions you conveyed to me in your last communication.

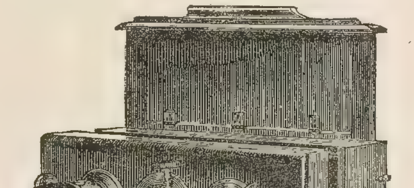
When I called on Mr. Hughes, of Oxford Street, on a former occasion, he had "something" in embryo, but that *something* was not hatched. So to him I went on my last day, and then found that he had brought forth a numerous and flourishing progeny of *carte de visite* cameras, with a slight cross of the stereo. palpably marked on their physiognomy.

In Lake Price's book you will recollect that there is the figure of a camera with four lenses, so that four portraits may be taken simultaneously in one plate. Mr. Hughes has modified this form, so that by a "repeat" arrangement eight card portraits are taken on a plate ten and a-half by eight and a-half inches. One-half of the plate frame is passed in with a lateral motion, till stopped at the point of adjustment by a spring, as in a single lens stereoscopic camera; one-half of the shutter is then withdrawn, and half of the plate is exposed to the action of the four lenses, which are then uncapped and capped simultaneously. On the shutter being pushed back, the other half of the plate is brought into position, and the operation rapidly *repeated*. The interior of the camera is divided by diaphragms into four compartments—the lower ones having greater space allotted to them than the upper pair, to allow for the lower part of the plate, usually stained by drainage, being kept out of the available field. The annexed sketch will make the arrangement more comprehensible.



Another form is arranged so that a stereo-camera may also be used for visiting-card portraits. This is nothing more than a twin-lens camera, *only* the plate, instead of being of the ordinary stereoscopic size, is equivalent to two quarter-plates, the two portraits being taken simultaneously. This is palpably a very good arrangement for amateurs, as the portraits may be mounted either as visiting-card portraits or as stereographs, as desired.

An extension of this arrangement, as shown in the following sketch, consists of three lenses placed in a row, to be used with a plate twelve and a-half by ten and a-half inches, in a frame having "a repeat" motion in a vertical instead of a horizontal

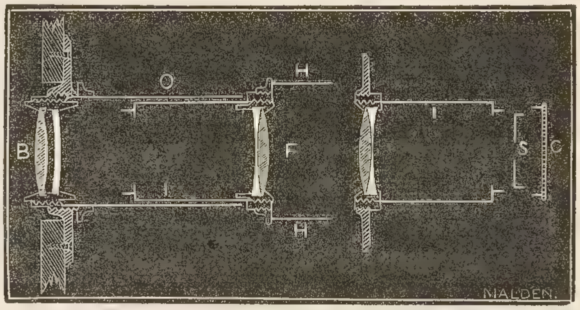


direction, as in the four-lens camera. By this contrivance three portraits are taken by one exposure, and six on one plate, which may be used either as card-portraits or stereographs—a more stereoscopic effect of course being produced by selecting the outside pair for stereoscopic purposes.

Mr. Hughes has lately made a peculiar form of stereoscopic camera for Russell Sedgefield, to be used either with view or portrait combinations. This consists of a camera with a pair of lenses, one being placed over the other if views are to be taken, the plate frame being double the size of the back of the camera. The two first counterpart views are taken, and the lenses covered; the camera is then moved over a desired angle; the second portion of the plate frame is then by a horizontal motion brought into position and exposed: thus duplicate stereoscopic views are obtained on one plate, and at the same time. If, however, portraits or groups of living objects are to be obtained, the camera is then turned over on its side, the lenses being at such a distance apart as to be in position for taking *twin* views *simultaneously* or instantaneously. This is a very handy arrangement for a travelling stereographer accustomed to work large plates.

My attention was also called to a camera-stand to be employed in the operating-room. This was made in pollard oak, the table-pillar being raised or lowered to the required height by an Archimedean screw acting on a cog-wheel and rack. Another screw motion caused the back of the table to be raised or depressed, so as to allow of the camera being inclined as required. A clamping screw rendered the whole arrangement perfectly rigid. I was struck, not only with the efficiency of this operating-room stand, but also with the very moderate price at which it is to be supplied.

Ere this you will have read in the last number of The British Journal of Photography a paper by Mr. Hughes on the various methods of mounting lenses [see p. 330]. When this was read before the South London Society, the president wished the author to give a "summing up" of the respective merits of the various contrivances; but this he declined doing. Now, you know the saying, that *a certain class* "step in where angels fear to tread;" so I will give you my ideas as to a good form of lens mount. In the first place, I own that I should prefer having my portrait and view lenses distinct, if I wished to secure *the best* optical results; and this opinion is founded on a conversation I once had with the late Andrew Ross. But we also know that very efficient lenses *are* obtainable, wherein the front combination of a portrait lens may be employed as a view lens; and such an arrangement, wherein a view and portrait combination is contained in the space of an ordinary lens mount, is certainly very convenient to the travelling photographer, especially for stereographic work. Well, then, I would have such a lens mounted thus:—



In the first place, each of the lenses in the back combination, B, should be burnished into their respective cells; so that when they were separated for cleaning they could not by any possibility be reversed. The lens cell would screw into an outer tube, O, which should screw *directly* into the flange; for I would dispense with a rack and pinion-fine adjustment, and consequently with "the jacket," now that cameras can be focussed from the back by means of an endless screw. The front cemented combination, F, should screw into the end of a tube, I, that should fit accurately, easily, and smoothly into the outer tube, O. At the end of the inner tube the various-sized diaphragms should fit; so that when using the lens as a portrait combination, by simply drawing out the inner tube, any-sized stop could be fitted into the end of it, and then it could be pushed in "*home*." When this arrangement has to be used as a landscape lens, it would only be necessary to unscrew the outer tube from the flange, pull forth the inner tube, unscrew the hood, and the male screw of the inner tube, on to

which the hood fitted, would then screw into the flange; so that the front lens in a reversed position would act for views, and any suitable stop, S, could be fitted in front of it, together with a separate "cap," C.

You will perceive that this is nothing more than a combination of some of the best points in Ross's, Jamin's, and Millet's arrangements.

Mr. Hughes has just introduced a dead black varnish, suited for backing glass positives, or stopping out skies, &c., in negatives, which has the advantage of not cracking. It may also be used for blacking the insides of cameras, lens mounts, &c., where a *dead* black is required.

On leaving Mr. Hughes's I stepped across the road to M. Bourquin's, in Newman Street, to look at some very nice camera stands suited for operating rooms, all the requisite motions being effected by powerful iron racks and pinions, the woodwork being in walnut. Some of these were very handsomely "got up," whilst others, of more homely appearance, retained all "the points" that would be looked for by a professional photographer, in the same way as a jockey looks to a horse.

Having got thus far in the description of my last day's photographic sight-seeing in London, and having much more yet to say, I must defer its completion till tomorrow, when you shall have a few more "last words" from

Dear Frank,

Yours, sincerely,

SIMEON HEADSMAN.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting was held on Thursday, the 15th ult., at St. Peter's School Rooms, Walworth,—the Rev. F. F. Statham in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Wall exhibited specimens of photographs by Mr. Wilson, Aberdeen.

The Chairman said the proceedings for the evening were to have been commenced by a discussion upon Mr. Clark's paper read at the last meeting, *On the Photogenic Action of Colour;* but he regretted to say that Mr. Clark was unable to attend, although he had sent a letter, which would be read by Mr. Wall.

Mr. Wall said before he read that letter he must inform the members that the experimental committee had commenced their labours by experimenting upon the dry process, to endeavour to find out whether they could approach instantaneous photography by that method. Several interesting experiments had been performed from which important results might be expected; but at present none of them were sufficiently far advanced to be brought before the meeting. At their next meeting a very interesting paper on the subject would doubtless be read by Mr. Hannaford, the Secretary of the Committee. In The British Journal of Photography of that day there appeared a few short remarks upon Mr. Clark's paper by Mr. Shadbolt, a member of their Society, who, doubtless, for good reasons had not hitherto made his appearance among them. Mr. Wall proceeded to read the article in question, which appeared in page 325 of this Journal, and then read the following letter from Mr. Clark in reply:—

Shooter's Hill, November 15th, 1860.

Dear Sir,—Will you kindly refer the Society to an article in The British Journal of Photography of to-day, in which the Editor calls my attention to "certain considerations" which have escaped my notice, and which will certainly heighten the value of the paper by being made known. In the first place the Editor notices the fact of my not "mentioning what sensitising materials were employed," and more particularly refers me to my last experiment, viz., the difference in the action of light by transmission through different coloured glasses on albumenised paper and collodion, and asks if the materials "were identical in both cases." My answer is, they were not; the albumenised paper was sensitised in a solution of nitrate of silver as usual, of the strength of eighty grains to the ounce, whilst the collodion was iodised chiefly with the iodides of potassium and ammonium, with a slight trace of bromide, and sensitised in the usual negative bath. The whole of the experiments referred to in my paper were made with the same collodion and bath, whilst the light in each case was (as nearly as could be guessed), of the same intensity. Reference is also made as to "the nature of the colouring matter employed." Of this I can say little, for I merely ordered the glazier to send me some strips of different coloured glasses, such as is commonly used for windows. The substances employed in the manufacture of this glass I am unacquainted with, although possibly this information might be obtained; and as I intend giving this subject further consideration shortly, I shall feel great pleasure in laying the results of future experiments before the members of this Society.

Mr. Wall continued: He thought the subject was a most important one, and he strongly recommended Mr. Clark to think over the points thrown out for his consideration.

The Chairman said although Mr. Shadbolt's opinion did not coincide with that of Mr. Clark, still they must be gratified to find that the latter gentleman's paper was of sufficient importance to have been the subject of particular remark in such an important Journal. He quite agreed with the Editor of the Journal and their Secretary that the subject was a most important one; and he trusted that by its pursuit the method of taking coloured photographs would eventually be discovered. It was, however, most necessary that the processes adopted and their results should be carefully recorded. He recollected on one occasion seeing Mr. Shadbolt taking some views, when he observed that the pictures on being taken out of the camera were beautifully coloured; but whilst they were looking at them the colours disappeared. It appeared to him that the question of the production of lasting colour depended more upon the nature of the surface than upon the transmission of light. It had struck him that if it could be preserved from contact with the air by being fixed under water the desired result might be obtained. It was well known that by altering the surface (as by pounding) some substances lost their colour, and that the same effect was produced by viewing them in different lights. Thus the surface of the table-cloth before him appeared green, because it absorbed the red rays, and reflected the blue and the yellow ones. If, instead of the gas which consisted of the three coloured rays, they could view it by a light composed of two rays only, the table-cloth would appear to be of another colour entirely. He should be glad if this subject were investigated by the experimental committee.

Mr. Ackland said: At the last meeting of this Society, during the discussion that followed Mr. Hughes's paper *On the Mechanical Adaptation of Portrait Lenses to View Purposes,* I was asked by a member how photographers could tell when one axis of a lens was central? and in reply, I stated that it was a "trade secret known only to a few."

In The British Journal of Photography for November the 1st, Mr. Shadbolt states, that in making this remark I must surely have been joking; and he then proceeds to divulge this secret, lest the readers of that Journal should have a laugh at his expense for allowing such a statement to remain unnoticed.

In reply to these remarks, I beg distinctly to state, that no photographer can determine whether a portrait lens is properly centered by the method proposed for that purpose by Mr. Shadbolt, even if he possess a good lathe and sufficient mechanical skill to use it properly.

I do not attempt to deny but that it would be possible by this plan to ascertain if a "view" lens was properly central, but I deny that it is at all applicable to the portrait combination.

The remarks that called forth this inquiry at the last meeting were made by myself in reference to portrait lenses, and the gentleman who made the inquiry, no doubt, referred to the portrait combination; and I again repeat that the plan I practise to determine the proper centering of lenses is a secret quite unknown to many lens makers, and even to Mr. Shadbolt himself.

Wherever I meet with a number of lenses by the same maker I carefully apply my test, and it frequently happens that not more than one lens out of six is centered properly; hence I infer that such a maker is ignorant of the plan I use, for did he possess it we may reasonably suppose he would apply it, and thus improve his productions without increasing their cost.

There are two makers whose lenses are properly centered, hence I infer they know this "trade secret."

I make these remarks lest the members of this society should imagine that I had been (as Mr. Shadbolt suggests) joking at their expense, and to disclaim being the inventor of this "secret."

The Chairman said he did not think that Mr. Shadbolt intended to cast the slightest imputation upon their Vice-President. It appeared to him that they were fighting against a shadow. He supposed that there were two ways of doing the same thing:—the one described by Mr. Shadbolt was a rough way of proceeding, useful enough in ordinary cases; and the other known to Mr. Ackland was a method by which mathematical accuracy might be obtained when required. Thus both were right in their way.

Mr. Ackland said Mr. Shadbolt's plan involved a first-rate lathe and brass-work of the best workmanship, and even then he would have the greatest difficulty in fixing the brass truly in the lathe, whereas by his plan any lens could be tested in ten seconds. Mr. Shadbolt's plan would only answer in any case for single lenses. His plan was not an invention of his own, for it had been published years ago; but it had been overlooked, and it was now a secret only known to a few.

Mr. Hughes said he could not help protesting against any one person claiming a superior method of proceeding, when he did not state what that method was. They had Mr. Ackland's word that it was a better method; but they had no means of comparing the results, or testing the working of the methods when one was unknown. They were not, therefore, in a position to give the unknown method the palm for mathematical accuracy. Mr. Shadbolt's plan was so far accurate that, if when the lens was revolving in the lathe, the image of the candle placed before it did not remain still, it was clear that the axis of the lens and of the lathe were not identical. If the lens were central, the image would not move. That was the usual test adopted in the optical trade.

Mr. Ackland asked whether Mr. Hughes could test a portrait lens accurately by that method?

Mr. Hughes said he thought he could.

Mr. Ackland said the inaccuracy of the axis arose from several causes—such as the lens being improperly ground, the cells being improperly cut, and the lens being improperly mounted. He could ascertain whether a four lens combination were accurate directly, and where the defect, if any, lay. He denied that that could be done by Mr. Shadbolt's method.

Mr. Hughes again protested against Mr. Ackland's secret method receiving the palm for accuracy.

The CHAIRMAN said he did not profess to hold the balance between them; but he thought that however true Mr. Shadbolt's method might be when testing one single lens, it could not well be accurate when testing a combination. He did not know that Mr. Ackland's method was more accurate, but he merely took for granted what that gentleman said.

Mr. ACKLAND here offered to show his method to the President, and to let him judge of its superiority. [No member having a portrait lens with him the proposal could not be carried out.]

Mr. HUGHES said that even if there had been a portrait combination present he should not have acquiesced in such a proceeding. This sort of meeting ought to be devoted to the discussion of matters in which all could join. He was sorry that their time should be taken up by invidious remarks, as it placed all of them in a false position.

The CHAIRMAN said he was not at liberty to stop any discussion.

Mr. ACKLAND said he should not have mentioned the matter if Mr. Shadbolt had not commented on his remark in the way he had done. He had only endeavoured to get out of an inconvenient question in the quietest way he could. He had not made it for business purposes, nor for the sake of making a boast of knowing what others did not know. All he could say was that he was possessed of a method Mr. Shadbolt was not acquainted with. He had considered it to be his duty to make the observations he had for the sake of his character.

Mr. WALL, the Secretary, said that at all events possessing and retaining a trade secret was not such a very heinous crime, neither was there anything dishonourable in so doing; but making that out to be a secret which was in point of fact no secret was at least ridiculous, and no person ought to be lightly charged with having done so. As Mr. Ackland had now placed himself in a proper position the matter had better drop.

Mr. LEAKE very much doubted whether combination portrait lenses could be properly tested in a lathe.

Mr. HERVE thought Mr. Shadbolt fancied Mr. Ackland was referring to a single lens. He had seen lenses tested in the lathe when the image "wobbled" or not, as the lens was accurately or inaccurately centred.

As we are at present so severely pressed for want of space, and Mr. Hervé's paper, however excellent, does not involve any actual novelty, we are compelled to omit it.—A vote of thanks was tendered to Mr. Hervé.

The CHAIRMAN said that Mr. Hervé's paper was most valuable, as containing the experience of a practical photographer. It would be of benefit not only to beginners, but to men who had met with difficulties for which they could not account.

Mr. MARTIN, referring to an observation made by Mr. Hervé whilst reading his paper, "that he preferred to filter his bath very slowly," asked his reason for preferring slow filtration, which certainly appeared to him at first to be very objectionable, as proto-oxide of iron would be formed by exposure to the atmosphere. Mr. Hervé also recommended ammonia to be added when the bath was too acid. That would form nitrate of ammonia, in which nitrate of silver was soluble. Ammonia ought not to be employed when a fixed alkali would answer the purpose better. Why did Mr. Hervé add collodion whilst preparing his bath? He presumed it was done to saturate the nitrate of silver with iodide, but he thought it was better to do so by iodide of potassium without ether, which it would acquire soon enough from the plates.

Mr. HERVE said his reason for adding the collodion to the bath was that it made the bath immediately fit for use, which it never was by the addition of iodide of potassium. With regard to the formation of protoxide of iron by exposure in slow filtration, he forgot to observe that he covered the top of the funnel with a piece of glass. The filtration removed any protoxide of iron that might be formed. With respect to the addition of ammonia, he must say he never found a bath require any, but a very slight quantity need be added, and the *liquor ammoniæ* ought to be used. If a carbonate were used it would require refiltration. Thus kaolin could not be removed under twenty or thirty filtrations, and even then it would leave a deposit on the plate. He found that that developer brought out the picture better than any other.

Mr. HOWARD said Mr. Hervé objected to the use of gutta-percha baths. Now he had a gutta-percha bath covered with shellac, which was perfectly hard, insoluble, and non-absorbent. Nothing could be better.

Mr. HERVE observed that the gutta-percha was elastic, whereas the shellac was not, and in consequence when pressure was applied the shellac would crack.

Mr. SIMPSON stated he had used gutta-percha for years successfully.

Mr. S. DAVIS confirmed Mr. Simpson's statement. He had a top once made with vulcanised india-rubber which spoiled the bath, but on altering it to pure india-rubber it answered perfectly.

Mr. HERVE said any body putting vulcanised india-rubber on a bath must be very silly, as the sulphur must of course injure the bath. He had a French-made gutta-percha bath once which turned his bath pink, and that he found arose from some soluble matter in the gutta-percha. He had several gutta-percha baths that he had been compelled to throw aside as perfectly useless. Why not use glass? It was easily carried, equally cheap, and excellent in every respect.

Mr. S. DAVIS said the vulcanised india-rubber bath he once had was warranted not to contain sulphur, but he found that it did.* He now used vulcanised india-rubber covered with a thin coating of gutta-percha.

* Vulcanised india-rubber is sometimes made with sulphuret of antimony, instead of free sulphur. A difference which, to a non-chemical manufacturer, would seem to justify him in asserting that it contained no sulphur.—ED.

Mr. HUGHES said the reason for using vulcanised india-rubber—which was open so obviously to the objection of containing sulphur—was that pure india-rubber was extremely sensitive to the variations of temperature, and that it was too elastic. Vulcanised india-rubber was not open to those objections, but it ought to be coated with a thin sheet of pure india-rubber to prevent its coming into contact with the bath. Gutta-percha might also be used for the coating, but there were some trifling objections to that to which the pure india-rubber was not open.

Mr. S. DAVIS then read a paper *On a Simple and Efficient Preservative Process*. [See page 346.]—Thanks were then voted to Mr. Davis for his paper.

Mr. WALL begged that the paper might be referred at once to the experimental committee, as there was not time then to discuss it; which course was adopted.

Mr. SAMUEL FRY, of Brighton, read a paper *On Instantaneous Photography*. [See page 348.] He exhibited several finely-executed pictures taken on three negatives.—A vote of thanks was given to Mr. Fry for his paper.

The CHAIRMAN said, by the means adopted by Mr. Fry, skies could be introduced into photographic pictures, and portraits could be taken without the sitter being compelled to look at a fixed point for a long time, whereby his face became almost burlesqued. Atmospheric effects could now be produced, and life could be given to the picture. A great number of persons objected to the principle of composing pictures by several negatives; but it appeared to him that when there was only one way to produce a given, and at the same time a true, effect it must be a fair way. If atmospheric effects and foreground could not be taken on one negative, by all means use two or even more. That which came nearest to nature was surely the most justifiable method to pursue.

Mr. Cotton said that instantaneous photography might give a better expression; but it would not give so good a photograph in portraiture.

Mr. HERVE said instantaneous photographs had been taken of different parts of the body at the same time. He did not think, however, that in a glass house in London the light was sufficiently strong for instantaneous photography. He had certainly taken instantaneous photographs in London, but it was with one of Voightlander's quickest lenses. Dust after rain would entirely prevent a picture being taken instantaneously. He thought it lay with the chemist to do a great deal towards rendering photography instantaneous.

Mr. WALL said it showed a great amount of philanthropic feeling on the part of Mr. Fry, who was a gentleman practising his profession, to come forward and give them in a few minutes the experience of years of labour. Such actions made them think better of mankind, and was one of the great benefits derived from societies like these. He was glad to see a practical photographer stepping forward to show the advantage of art culture. Nothing had been so horrible and offensive as the white paper skies—or rather no skies at all. If they would hold a piece of paper over the sky in one of Mr. Fry's pictures they would perceive that more than half the beauty of the picture was gone. He was quite sure that, if the subject were placed in a proper light, pictures might be obtained equally good by instantaneous photography as by the ordinary method.

Mr. HANNAFORD then moved the adjournment of the discussion until the next meeting.—The motion was carried.

Mr. SEBASTIAN DAVIS exhibited a new developing-box, with camera attached, for stereoscopic pictures by the wet process, folding up in a space fourteen by six inches. A hood of lined black calico cloth, under which the head can be put, does away with the necessity of looking at the plate through coloured glass when developing. He also exhibited a new box for carrying plates without injury to the film.

The thanks of the Society having been given to Mr. Davis,

The CHAIRMAN announced that the next meeting of the Society would take place on the 20th of December, when Mr. Wall would read a paper entitled *Photographic Portraiture, with a Glance at Its Comic Aspects*, illustrated by photographs, and a report of the experimental committee.

The meeting terminated with the usual vote of thanks to the chairman

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE first monthly meeting of the members of this Society was held on Monday evening, the 19th ult., at the Golf Club House, Blackheath,—the President, C. Heisch, Esq., in the chair.

In the absence of the two Secretaries of the Society, the CHAIRMAN read the minutes of the last ordinary meeting, and also of a special general meeting, which were confirmed.

The CHAIRMAN regretted that Mr. Heath, who had promised to read a paper to them that evening, was unable to do so in consequence of his specimens having been mislaid. His paper would most probably be read at their next meeting, and in the meantime he had sent down some very beautiful photographs of views in Devonshire, to one of which their attention would be more particularly directed, later in the evening. In the absence of any other paper he (the Chairman) begged to offer a few remarks upon the subject of *Toning Positives*, a subject of great importance. Latterly a new system of toning positives had come into vogue, called the *Alkaline Gold Toning*. That method possessed such manifest advantages that its disadvantages had been hardly at all considered. The rapidity with which the operation could be performed, and the very

great certainty of securing any tone desired, were two of its known advantages. It also had been said that prints toned by it possessed greater stability than those toned by the old method; but that was a point on which he thought a conclusion had been come to rather too rapidly. If it were *as stable* as the old process it would be universally adopted in preference; but they must hesitate a little before they came to a decision upon mere theoretical grounds when they had such short practical experience upon the subject. So far as his experience went he was not sure that it was so stable as the old process. The theoretical reason given for supposing it more stable than the old process was, that all the decomposition that took place between the chloride of gold and the hyposulphite of soda, mixed in the old toning-bath, was avoided, so that there was no deposition of sulphur. He believed that the old process had been very much maligned, and that it would be very much more stable if people would take the trouble to carry it out properly. Those who put their prints into the toning-bath without washing, or worse still, who added nitrate of silver to the bath for the mere purpose of more rapidly obtaining the desired tone, had, of course, no reason to complain if their prints faded. The proper method, in his opinion, of using the old process was this:—Make a solution of hyposulphite of soda, containing one part of hyposulphite of soda in two parts of water. Dissolve the necessary quantity of chloride of gold, which varies a little according to the tone required, in half as much water as was mixed with the hyposulphite of soda. Add to this a sufficient quantity of carbonate of soda to make it alkaline, and then pour it gradually into the solution of hyposulphite of soda. If that were done carefully very little decomposition would occur. If any sulphur were deposited it should be filtered off before using the bath. Wash the prints well so as not to leave the slightest portion of nitrate of silver on them, and then place them in the bath until the desired tone is obtained; then wash them well in two or three waters, and put them into a clean solution of hyposulphite of soda, consisting of one part of the salt to six parts of water, and allow them to remain in that from a quarter to half an hour, and wash them thoroughly in water. In that way he believed prints might be well toned and rendered perfectly safe. He had prints toned in that way nine years old that had been subjected to a variety of illtreatments,—sometimes being kept in the light hung up in frames and then taken out and put in dark drawers, others had been sent to exhibitions, and several across the sea. He had one that had been taken without any glass to New Orleans in an ordinary travelling box, and which subsequently made a tour through Canada. That was a trial to which few photographs had been put, considering the warm moist atmosphere of New Orleans. [This photograph was produced, and appeared to be in as good a condition as when originally printed.] His reasons for considering that the alkaline gold toning was not more permanent than the old process were these:—In that process the print was put into a mixture of chloride of gold and carbonate of soda. When toned it was taken out and put into a solution of hyposulphite of soda. Carbonate of soda and chloride of gold were thus in both processes put into the hyposulphite of soda, and any decomposition which took place in the old process in the bath, took place in this in the pores of the paper. If it were certain that the liability to fade was owing to the mixture of the hyposulphite of soda and chloride of gold, there was equal danger in both processes. In fact, he had prints toned by the new process only twelve months old which had shown symptoms of fading, although he was not prepared to say that it was owing entirely to the alkaline gold toning. He had hoped to have laid before the Society the result of some experiments he had made upon the subject. Those experiments would not have settled the question entirely, but they would have shown whether or not a print toned in the old way really contained more sulphur than one toned by the new plan. Up to the present time sulphur had been looked upon as the great enemy to the stability of photographs, and therefore the presence of sulphur would be the thing to look to in determining theoretically which was the most likely to suffer. He took a piece of sensitised paper, which he divided by weight into three equal portions, and exposed half of each to the light. He then toned the first piece by the alkaline gold process, and the second by the old process, leaving the third without any fixing at all, merely washing it well in water. He then boiled all three in nitric acid, which converted any sulphur they might contain into sulphuric acid, the quantity of which was determined in the ordinary way by sulphate of baryta. He took the untoned piece as a starting point; but he found that the whole quantity of sulphate of baryta was so small that no deductions could be drawn from any apparent differences, which came fairly within the limit of the errors of experiment. He however should repeat the experiment on a larger scale, when he would communicate the results he then obtained. He wished particularly to point out to the working members of the Society that the stability of the alkaline process required most jealous watching, and that he at present did not see any reason for considering it more stable than the other. One very great advantage in the alkaline process was that it was not necessary to *over print* the positives; whereas, under the old system, they required over printing, which was a very tiresome operation. However, he was not quite sure but that very much over printing thoroughly baked the image into the paper, and gave the stability so much desired. He saw that Mr. Thomas, in his recent paper, mentioned the fact that photographs printed in the sunlight were much more stable than those printed by diffused daylight. In this he quite agreed; but there was one point that Mr. Thomas had not noticed, namely, that the sunlight penetrated the dark parts of a negative, and brought them out much more in proportion to the lighter parts, than diffused daylight. [He exhibited a stereoscopic view of a coast scene in which, when printed in the sun, the distant cliffs were well shown without the foreground being over printed, while with the same negative printed in diffused daylight the foreground was quite burned up, and not a trace of the distant cliffs could be seen.]

Mr. Glaisher remarked that his experience quite coincided with this.

Mr. Skaife said he found that he could print from a very weak negative, almost a positive, in the sunlight, which he could not print at all in diffused daylight.

The Chairman then exhibited some stereoscopic views he had taken at Lynton and other parts of Devonshire on plates prepared with raspberry syrup, as recommended by Mr. Sisson. The collodion used was made from *paper* no less than six years ago, which he considered was a complete answer to those who said that collodion so made carried in itself the seeds of its own decay. He also exhibited the specimens by Mr. Heath, above referred to, taken in the Duke of Bedford's grounds at Tavistock. The one especially referred to was twelve by ten inches, and was taken with *the smallest-sized orthographic lens*, by Ross, with a No. 2 stop. The lens was only warranted to work upon a plate 8½ by 6½ inches, its focal length being 12 inches; yet it would be observed that even the edges of the picture were perfect. The others were taken by one of Grubb's lenses.

A discussion ensued relative to the printing of the photographs to be distributed among the members.

Mr. Skaife exhibited some chromo-crystal portraits produced by his pistolgraph, among which was the one of Sir David Brewster.

After some further conversation, the proceedings terminated with the usual vote of thanks to the Chairman.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

This Society resumed its meetings for the season on the evening of Tuesday, the 13th ult., in George Street Hall, Edinburgh. Sheriff Moir occupied the chair.

On the table were some specimens, contributed by M. Joubert, illustrative of his enamelled process on glass, and also of his carbon process on paper. They were inspected with much interest. A letter from M. Joubert, accompanying them, was read, but there was nothing of general interest in it.

Mr. Colin Sinclair exhibited a number of very beautiful prints by Continental and other artists.

The minutes of the last meeting having been read,

The Chairman, after regretting that Sir David Brewster, the President of the Society, was unavoidably absent on that occasion, stated that this had been an extremely bad year for photographic pursuits, and he was afraid it would tell very much on the next exhibition; still, from the fact that in certain quarters very considerable improvements had been made, they might perhaps venture to hope it would not be quite so bad as some might anticipate. It had been suggested to the council that the particular time of the year at which the exhibition of the Society was usually open was not the best; and accordingly this year the time of opening the exhibition would be postponed from Christmas till February. Some might think this alteration would bring it into competition with the other exhibitions of paintings then open; but this, instead of being a drawback, would, in his opinion, be a positive advantage, as those who visited the one would most likely not be satisfied without visiting the other. He thought it was a most judicious alteration, especially when the present state of the weather was considered. It was a matter of regret that on the present occasion there was no paper to be read; and he would urge on those members who were able to write papers to do so, in order that the like might not occur again. It was not necessary that such papers consist of new processes or discoveries, but the members might detail their experience in working. For instance, in preserving plates with wort, as recently brought before their notice by Mr. Macnair, many who had tried it got nothing but failures, while Mr. Macnair himself, and others, had been quite successful. This was one of many similar cases on which varied experiences might advantageously be brought to bear. For the present there was nothing but an exhibition of some pieces of apparatus, which some gentlemen had kindly agreed to show.

Mr. L'Amy exhibited Skaife's patent shutter for instantaneous exposures. This was a slide made to fit in the camera, just behind the lens. It contained a pair of folding doors, like the shutters of Daguerre's original camera, with an india-rubber spring so arranged that, when opened, it closed with great rapidity. The cost of it was according to size—that exhibited (a small one) cost about a guinea. Mr. L'Amy also exhibited a species of turning lathe he had invented for cleaning glass plates. It is on exactly the same principle as the albumen disintegrator of Mr. Noton, (a drawing of which appeared in the last number of The British Journal of Photography), a series of buffs being fixed on the small wheel. Mr. L'Amy gave a practical illustration of its use by cleaning a plate with it, which when done was handed round the room, and pronounced to be very well done. The time occupied in cleaning the plate was not very much more than would have been occupied had it been done by the hand. It requires two persons to work it, one to hold the plate and another to drive the wheel. The cost was said to be about £3.

A camera, manufactured by Mr. Bryson, of brass, with a slide made of a species of india-rubber, was exhibited. Neither heat or acids affected this slide.

Mr. MOFFAT showed Woodward's solar camera, with some specimens.

The CHAIRMAN exhibited Melhuish's metal stereo-camera and lenses.

Mr. TAYLOR said that at the last meeting of the Society the pressure of business had prevented them remembering to do a small act of justice to Mr. Kinnear on his retirement from the secretaryship of the Society. It was not enough that such services as Mr. Kinnear's should be passed over with a mere formal vote of thanks; he moved that the silver medal of the Society be presented to Mr. Kinnear, as a small recognition of his services. This was unanimously approved of.—The meeting then separated.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held on Wednesday, the 14th ult., at the Chorlton Town Hall,—Mr. W. Griffiths, one of the Vice-Presidents, in the chair.

In opening the proceedings the CHAIRMAN regretted the absence of the Honorary Secretary, who, he was sorry to announce, was through illness unable to be present. Mr. Sheard, who kindly undertook to supply his place for the evening, then read the minutes of the last meeting, which were confirmed.

Mr. WARDLEY stated that he had no doubt most of them had seen an article that appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, of November 1st, by T. F. Hardwich, in which an address delivered by their Chairman at a former meeting had been, according to his opinion, unfairly commented upon. He could not agree with some of the opinions expressed, particularly those in reference to the progress that had already been made in photographic chemistry. For his own part he doubted whether they knew any more of the nature of the various chemical changes which took place in photography than they did at the time when the collodion process was discovered. He had thought this a matter of sufficient importance to warrant him in bringing it before the members, as some might wish to give their opinions upon it; and in order that they might be in a position to judge of the facts, he would call on Mr. Sheard to read the article from the Journal of the 1st, and afterwards the reply of the Chairman, which would be found in the one for the 15th, which had just come to hand. The two having been read,

Mr. SHEARD said he could not understand the object Mr. Hardwich had in view in his "Comments;" for he did not deny any of the statements in that part of the address to which he more particularly objected as being contrary to fact, but merely took exception to the policy of ever reminding members of a photographic society of the unsatisfactory chemical condition of the art. It appeared to him that so unimportant a matter as this did not deserve the prominence Mr. Hardwich had thought proper to give it.

Mr. ROGERSON thought, and several other members concurred, that if no allusion to collodion had been made in the address, the whole matter would have been passed over in silence.

After a further expression of opinion on the part of other members, approving of the reply which had just been read, the subject dropped.

Mr. GRIFFITHS then read a paper—

On the Preparation of Iodo-Nitrate of Silver: its Chemical and Photographic Properties.

HE began by describing its preparation from the two salts, as also its formation in the working of the collodion and other processes, and then explained its chemical nature and reactions. He said that the photographic properties of this compound were deserving of far more consideration than it appeared to him they had yet received. All the processes that we were accustomed to work, and in which iodide of silver formed the sensitive medium, with the exception of the daguerreotype, were dependent mainly upon the presence, in minute quantity, of this salt for their sensibility under actinic influence, and not, as was generally supposed, to the presence of free nitrate of silver. In support of these views he described in detail several experiments he had performed: one in which he had prepared several collodion plates in the usual manner, but on taking them from the silver bath they were deprived of every trace of free nitrate and dried. In this condition the film of collodion was ascertained by an appropriate test to contain both iodide and iodo-nitrate of silver; upon exposure these plates had invariably been found equal, if not superior, in sensitiveness to others prepared from the same collodion, exposed wet, and with excess of free nitrate. He believed that a more extended investigation into the properties of this salt would have the effect of satisfactorily clearing up many of the difficulties connected with the working of the dry processes, as well as explaining some of the phenomena which were constantly being brought under our notice. He then called the attention of the members to the retarding effect as respects sensitiveness produced by adding iodine to collodion. He did not think the generally received opinion that this was owing entirely to the liberation of free nitric acid in the bath was quite correct, for the quantity set free by using a collodion containing even as much as one grain to the ounce would be so exceedingly small as to make it very doubtful whether this ought to be accepted as a true explanation. From the result of some experiments he had made he believed it to be owing more to the formation of iodic acid, which might occur in the following manner:—For every six atoms of iodine in collodion five atoms of iodide of silver, one atom of iodic acid, and five atoms of nitric acid resulted upon dipping the plate in the bath of nitrate of silver. The nitric acid, from its powerful affinity for water, was quickly disseminated through the bath, and in consequence its influence was diminished; but the iodic acid remained partially imprisoned in the film with the iodide of silver. They were all aware of the retarding effect produced by free nitric acid in the bath, but according to his experience this was slight as compared with that exercised by iodic acid under the same circumstances. On some future occasion he hoped to have an opportunity of explaining to them what he believed to be the *rationale* of the effect produced by free acids in the bath in diminishing sensitiveness.

A long and animated discussion then followed.

A MEMBER exhibited a negative portrait on glass, which had been developed with sulphate of iron after an exposure slightly greater than would have been required for a positive: after it had been fixed and well washed it was at once covered with a saturated solution of bichloride of mercury in water, which was allowed to remain on till the image became whitened. It was then again well washed, and lime water diluted, one-half was poured over it, when, after a short time, a dense and very satisfactory negative was the result. It was handed round for inspection, and was greatly admired for the softness and delicacy of its half-tones, which were perfectly preserved.

Mr. SHEARD wished, before the members separated, to correct one or two errors in the report of the last meeting as it appeared in the Journal. The first error he wished to have corrected was one in which he was reported as having said that the plates prepared by hot water had not in his hands turned out satisfactory, whereas what he stated and gave the meeting to understand was the direct contrary. Another error was that in reference to the cause of his failures, which was not fog, but a peculiar water-marking near the borders of some of his plates. [A letter from Mr. Sheard on this subject will be found among our "Correspondence."]

After the usual vote of thanks, the meeting was adjourned.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VIII. *(Continued.)*

MATERIALS, &c.

TO resume our studies, let us still give that attention to the subject of vehicles or mediums which its importance demands. In painting in oil we meet certain difficulties, the proper combating of which (if you be an honest man) should always be made a matter of thought in your practice. Vehicles containing oil have more or less a tendency to discolour in time, and for this reason varnish and turpentine are added to as great an extent as is consistent with their proper manipulatory qualities. Being of great importance to the purity and brilliancy of your tints, the more colourless your vehicle the better; but I should prefer a vehicle which, although slightly coloured at first, underwent but little after change, to one that, colourless to begin with, darkened upon exposure to light and air; because in the one case I might, during work, aim at counteracting its tendencies, and in the other I could not. I have before referred to the yellowish-brown, leathery appearance assumed by photographs coloured with oil glazings only, in consequence of the quantity of vehicle being in undue proportion to the amount of pigment; but without due and proper care the same defect will mar the beauty of even a solidly-painted picture. To ascertain the character of your vehicle in this respect, try it with a little white. When in old pictures you see the delicate purity of a fair face changed to a tawney yellow, some brilliant azure sky turned to dingy green, or once white drapery of the colour of wash leather, you may set it down to the injudicious use of certain vehicles, and make up your mind to a careful and studious choice of such for your own work. That these defects, common as they may seem, are not absolutely inseparable from the use of oil colours, is proved by the fact that the pictures of Titian, and so many of the Venetian masters, still retain nearly all their original loveliness and purity of colour. Very great attention has been recently directed into this channel, and we now have a great variety of excellent vehicles or mediums prepared and sold for use.

You have all heard how our photographic brethren talk about collodions:—one denouncing A's, but praising B's; another extolling A's, and sneering down B's; while a third laughs both to scorn, and cries "whose equals C's?" Now much the same thing is done by artists in recommending vehicles—one praising this and another that. A vehicle now much used by artists of position and talent is copal varnish thinned with turpentine. Now I cannot use this;

but that is no reason why you should not try it. Miller's * glass medium is another vehicle which many of my brother painters denounce, but which I use and like vastly: its chief defects are, that it hardens very slowly and dries rather too rapidly during work. You cannot knock the colour about with impunity with this vehicle; and it is frequently a long time before you can put a second painting over your first. But it is quite colourless; does not appear to be greatly altered by time; leaves your whites *white* and not buff; accordingly does not destroy the delicacy of your tenderer tints; and when dry is very hard.

There is a "marble medium" for use with oil colours, sold by Robertson, of Long Acre, invented by Mr. Parris (an eminent photographic colourist) for repairing Sir James Thornhill's pictures, in St. Paul's. It dries very hard, and without gloss. I have heard good photographic colourists recommend this medium very strongly. Wax, it should be remembered, becomes discoloured almost as readily as oil, and of this the marble medium certainly contains a large proportion.

By-the-bye, I may as well seize this opportunity of reminding or informing you that oil colours are sure to become discoloured if deprived of light. For this reason it is very bad policy to shut them up in the ordinary miniature cases.

Having laid before you the disadvantages of a vehicle containing too much oil, I must now prevent you from running to the other extreme. Varnish, when used in too large a quantity, is a fruitful source of cracking, because of the oil of the last-applied colour being absorbed into that of the previous painting—the top surface drying quicker than the lower becomes rent.

It may be more fair—for, after all, not my words but your own good sense will be your better guide—to add that Haydon, and other eminent practical writers on art, advocate the use of pure oils, "Honest Linseed" more particularly.

Magilps are mixtures in various proportions of varnish and oil, varying in their characteristics according to the nature and quality of the materials. Mastic varnish and drying or prepared linseed oil forms a magilp which is sometimes called English varnish, which the amateur will find most manageable; but some painters prefer that prepared with copal varnish. Other oils are also used for the purpose.

Another vehicle, sometimes much valued by artists, is prepared with nut oil, litharge, and pure white wax. Take two parts of the first, one of the second, and a small portion of the latter, and with your slab and muller grind them well up together, diluting afterwards with a little mastic varnish.

A vehicle which unites some of the qualities of oil and water in a very useful way is made by dissolving one part borax in twelve of boiling water, to which is added an equal portion of white lac varnish. This mixes readily with your oil colours and dries very quickly, removing also some of the objections noticed in the use of vehicles more purely oil. (A little time since I heard of the above receipt being sold for rather large sums as "a great secret.")

There are a great variety of mediums and vehicles, some of which are admirable in use and result, but I might confuse you, perhaps, did I dwell upon them, although I think it very necessary that you should try several vehicles, inasmuch as with some you are sure to work better than with others. For instance, one painter, experienced though he might be, would work with slow and uncertain touches; for a vehicle which dried too rapidly would be quite unsuitable, inasmuch as he would be unable to alter or retouch. Again, another who worked as slow, but was more certain, would like his colours to dry quickly, in order that they might not be disturbed or altered by his after touches; and so on *ad libitum*. Find therefore that medium which, otherwise unobjectionable, best suits your peculiar practice or facility of hand.

* Of Long Acre; I forget the number.

Foreign Correspondence.

Paris, November 27, 1860.

The present is decidedly a moment of repose in the product of new processes. Innovations are becoming rare; and I see from the reports of your own societies that the same thing is noticeable in England. All the efforts and labours of photographers seem tending to new applications, and especially to the improvement of results already obtained. However, I have to mention a communication made last Friday, the 23rd, to the French Photographic Society, and which excited a lively interest: it was on M. Fargier's printing process. At the preceding meeting some specimens, sent by the inventor, had been much remarked and admired, as superior to those printed by the usual means from the same *clichés*. It was only regretted that the mode of operating had not also been given. This time, M. Fargier, having secured his interests by a patent, described his method. It is far from being complicated, as you will see; and the beauty, I might almost say the perfection, of the results obtained is solely due to the following simple observation, which the inventor has known how to turn to account:—When a transluced body, sensible to the light, is submitted to its action, that action commences at the surface, and extends more or less into the interior, according to its greater or lesser intensity; that is to say, it penetrates very far into the portions corresponding to the whites, and but a little way into the half-tints, and so on. M. Fargier covers a glass with gelatine containing charcoal powder in suspension, and sensitised with bichromate of potash. Then, having applied the negative to be reproduced, he exposes the glass to the light. So far, there is nothing very new. But, after the exposure, he spreads collodion over the surface, and plunges the whole into warm water. The double film of gelatine and collodion comes off from the glass, and all those parts of the gelatine in which the bichromate has not undergone the action of the light, dissolve; the result is that the whole image remains on the collodion with which it has been in contact. The picture, with the collodion uppermost, is fixed on a sheet of paper. In this manner the most delicate parts of the picture are preserved in all their purity, and the modelling is exquisitely fine.

A communication of another kind, though equally interesting, consisted of several gigantic portraits, presented by M. Disderi, and which he had taken with the help of Wothly's process and amplifying apparatus. The most sceptical were obliged to acknowledge the merits of these truly artistic works.

It seemed as if the portraitists had conspired to engross the Society's attention on this occasion. M. Camille Silvy had sent from London a series of visiting cards of remarkably good execution. His special endeavour is to operate very rapidly. Several portraits of children, and a picture representing a horse in movement, told of his perfect success.

Mr. Bingham placed before the meeting several positive pictures printed with electric light in less time than that required by solar light. Mr. Bingham employs Professor Way's lamp, in which, as you are doubtless aware, a train of mercury is substituted for the two charcoal points. The light emitted by this lamp is uninterrupted, and its composition even renders it much more photogenic.

Mr. Harrison presented some small pictures obtained by the steam-printing process, spoken of sometime ago by the American papers. He affirmed that by this process 4000 copies could be printed off in an hour. It appears that this expeditious system has already been put to a somewhat singular use by your Transatlantic cousins. At a recent election, each voter received the portraits of the candidates by way of voting tickets. The idea deserves to be known. As to the means employed for the printing, Mr. Harrison promised a description for the next meeting.

Dr. Sabatier, desirous of proving the applicability of his process, which I transmitted to you in a former letter, to portraits and views, sent several specimens, whose merits were duly appreciated. They are very good pictures, of satisfactory dimensions (full-sized plate), and offering very delicate modelling, combined with great vigour of tone. They do credit to the laborious amateur's method.

Lastly, we saw a very remarkable picture, photographed upon stone from an engraving, and executed by M. Asser, of Amsterdam, by means of the process that he communicated to the French Society in 1859, and which, as he tells us, he has left unmodified.

At this meeting, Count Sevastianoff, a Russian amateur, who has made a long stay at Mount Athos, announced that he had brought back with him 3,500 *clichés*. In this immense collection are especially included a large number of manuscripts and paintings. This will doubtless prove to be a very interesting work, in which the learned will probably discover many a precious document.

ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

PERMANENCE OF POSITIVE PROOFS.

To the Editor.

Sir,—It may seem somewhat out of place publicly to attack a paper read before a photographic society for that particular society's benefit; but when such a paper is printed in the columns of a leading photographic journal it becomes, in a certain sense, public property, and the public has a right to form and express its opinion upon it. On this ground I beg a small space of your columns to notice the paper *On Failures in Printing*, &c., by Mr. Ewing, in your number of the 15th November.

The first impression on one's mind after reading Mr. Ewing's paper is, that he is at least three years behindhand on the subject of which he treats. He animadverts on the *permanence and printing* of photographs precisely as photographers would have done, and actually did, three or four years ago, as though since that period no progress had actually been made in the one or the other.

After admiring Mr. Ewing's poetical introduction of his "failures," we pause at the following paragraphs:—

"Now I will tell you of a great difficulty that stands in our way, and that is a want of permanency in our productions: *our toning and printing have not as yet given us anything that we can with any assurance term permanent.* . . . Certainly this fact demands great attention, as we are very far from having overcome this serious difficulty. . . . With the old hypo. bath there was little or no trouble compared with either of the foregoing (the alkaline and *sel d'or*), and yet I have seen prints quite as clean and beautiful produced with it as with any of the former. . . . But when we place it before the theory of our President it will bear away the laurels in point of permanence. . . . Allowing that the print is beautiful from the beginning of the process until the end, how perplexing is the fact that this same disease (that annoying jaundice colour) after a time returns, and that in a space of five or six years we find our darling subjects spoiled by an incurable attack of yellow fever!"

I must refer those of your readers who wish to know in what connexion these extracts occur to the paper itself. What they may think about this doctrine I cannot tell: to me it appears very much like an attempt to drag us a few steps backwards instead of one in advance. Is it really true, Mr. Editor, that we have "attained to nothing like permanency in our productions?" Have the researches of Mr. Hardwich, Maxwell Lyte, MM. Davanne and Girard, and others, really thrown no new light on the subject? Is the alkaline toning bath inferior to the old gold and hypo. in its capability of yielding permanent proofs? And are all our "darling subjects" really doomed in five or six years to an "incurable attack of yellow fever?" O ye vain, credulous photographers! take a last long look at your "darling" creations before the fatal malady seizes them, and they fade from your fond vision for ever! But cannot we retain them a little longer?—Is there *no* hope? Certainly not from Mr. Ewing; so we must look to other quarters, and, happily, we are at no loss, for I imagine that you, with the majority of enlightened photographers, think very differently on the subject, and have come to the conclusion, if they have read his paper, that he has been guilty of a palpable inattention to facts, to say nothing of theory, when he penned the statements I have quoted. I am not going beyond facts when I state that there are plenty of photographers who could produce specimens in *abundance* by the alkaline bath, which, after an exposure of say three years, do not exhibit the smallest signs of the "yellow fever" attack; but I imagine it *would* puzzle them to produce, in many cases, even a single specimen where these signs *were* apparent; whereas, on the other hand, it would be equally puzzling to produce one by the old bath that did *not* exhibit these signs. I do not say such latter are not in existence, but I do say they are extremely rare, forming the exception, and that a very scarce one, instead of the rule.

Recent investigation, conducted, I believe, in the most scientific and systematic manner, has condemned the old method as entirely *wrong in principle;* and the sad experience of all justifies the verdict, pronouncing it the vile and sure destroyer of all our workmanship. In this dilemma the alkaline bath comes to our aid, and I am not alone when I state my conviction, founded on experience, that prints toned by carbonate or phosphate of soda and gold, fixed in *new hypo.* and *properly* washed, will be found as lasting as the most permanent engraving. After a most critical experiment of prints toned now nearly three years ago, I have failed to detect by comparison the slightest alteration or change; and if they have stood *perfectly* unchanged for three years, is it not a strong presumptive assurance that they will remain so three more? And if they will stand the test of *six* years' exposure without evidence of fading, what shall prevent them standing *sixty?*

We are ill prepared, then, to listen passively to Mr. Ewing, as he steps coolly forward and says that all our proofs are doomed to fade; and, as the best means of preventing it, indirectly recommends his fellow-workers (for so I interpret his meaning) to continue the use of the old gold and hypo. bath.

When a gentleman undertakes to enlighten others on any subject, he ought certainly to endeavour to make himself as well acquainted with it as possible, lest he render himself liable, as in the present instance, to be charged with a mis-statement of facts, and be found advocating a system which the common voice has pronounced unsafe and experience worthless. Mr. Ewing deplores the loss photography sustains by the want of confidence on the part of the public in the permanence of its productions; but his paper is well calculated to foster this feeling, and if all photographers wrote in his strain, and acted on his principle, it would certainly be a long time before such distrust was removed.

I am glad that you, as the conductor of an influential Journal, have condemned the old method as exploded, and given your testimony in favour of its young and infinitely more worthy rival; and I trust the day is not far distant when toning photographs by gold and hypo. in combination shall be known only as a monster delusion of the past.

Apologising for the unexpected length of this letter, I am, yours, &c.,
P. P.

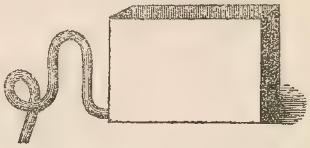
[We believe it to be a recognised custom that all published matter should be liable to fair criticism: the end and object of publication is for the furtherance of our art, and therefore we think our correspondent is quite in order in expressing his views relative to the paper to which allusion is made; and free discussion upon all matters relating thereto is in our opinion one of the best means of attaining that end.

The author of the paper to which exception is taken did well in propounding his views; because, if they be erroneous he benefits himself directly by calling forth arguments against them by those better informed, and if sound he benefits others by his experience: in either case the public receives advantage from one side or other. Truth never loses by discussion; and to the freedom of it we are indebted for the sound principles advocated by our correspondent, who judges correctly in attributing to us coincidence with his opinion that toning by old hyposulphite of soda is wrong in principle, and nearly obsolete in practice; that toning by means of *sel d'or* is only not quite so bad; and that the use of the alkaline gold bath is based upon a sure and scientific foundation, not stumbled upon by accident, but worked out with a definite purpose, from established data to start with.—Ed.]

AUTOMATIC WASHING-TROUGH.—DRY PLATES.

To the Editor.

Sir,—A siphon for a washing-trough, although of larger capacity than the feed-pipe, can easily be made self-acting by merely turning a loop on the long leg, as in this rough sketch:—



The water retained in the loop after each discharge serves the same purpose as the valve which you propose, and has the advantage of simplicity. The above may be of service to your correspondent in the Journal of the 1st November, Mr. W. Church. A few trials may be necessary to determine the proper size of the loop. Although I have had little or no experience in any of the dry processes, I prepared two 9 × 7 plates, according to the formula of Messrs. Petschler and Mann, a few days after it appeared in the Journal. The plates having been coated with chlorided albumen and dried, one of them was exposed to ordinary daylight, the other kept in the dark. Both being then well washed and dried, were exposed in the camera at the same object. On developing, the plate that had been kept in the dark turned out a very good negative indeed; the other, to my surprise, came out a positive by transmitted light, but very much fogged. I have had no time to repeat the experiment.—I am, yours, &c., WM. RODGERS.

November 5th, 1860.

A BREEZE FROM SOUTH KENSINGTON.

To the Editor.

Sir,—Whatever is the matter that you should begin to "kick up such a row" because our Government intends to start photographing? What strange thing has befallen you? If I am wide awake and understand what I read, and believe what I have read for years about cameras, optics, chemicals, and photographers, I might say with you and some of your correspondents "more the merrier;" but "it is a long lane that has no end," and I think the end of profitable photographing is just a-head.

You have well said that photographers are a patient class. I think so too, and often wonder that no pen has been taken up to write in their defence. Many of them are artists, driven from their favourite pursuit of painting, and might have obtained a respectable living in this new line; but down rushes a torrent of amateurs, cobblers, tinkers, tailors, lawyers, clerks, doctors, and parsons, egged on by the everlasting baits held out by

journalists, camera and chemical sellers, giving instructions for buying their stuff. Why not offer to give instructions for buying medicine to heal their bodies? Why not give instructions in electro-plating, electrotyping, lithographing, the use of microscopes, telescopes, and all other scopes (echo answers "why not?"), as well as cram the world full of photographers? "But," says Mr. Griffiths, in Chorlton Town Hall, "if we would know the estimate in which photography is held, we have only to walk through the streets of our towns, and note down the number of galleries we everywhere see." Then, if this prove the more the better, why not let governments, nations, and kingdoms be jolly photographers all, and take portraits at twopence a head, as they do in the most fashionable watering places in the East Riding? This we may thank the swarm of amateurs for, who rob the professional man of his daily bread. I can speak feelingly: my profits have not cleared my chemicals for months.

A Belgravian puppy was lamenting in an aristocratic photographic journal some time since that, as he had no more friends to take, he would like to begin to take street views, but was afraid people would stare at him. There were no pistolgraphs at that time; but I could have put him up to a dodge, by dressing him up as a "flunkey," and putting a lens at the side of his hat, tied with a girder: it would pass for a cockade. But no; I had rather he would think how many poor fellows he had robbed of a loaf of bread, by taking his rich friends who could and would have paid some one, had it not been for him, and, as there are some thousands of such rascals, it will tell in time. But why, as I said before, do you find fault with the Government? Let its officials photograph on, and when all the world can photograph all the rest of the world, then we must stop and clap the cap on. As this is the sort of thing you and your brethren have been bringing upon yourselves for years, bear it manfully. I fancy there must be some sore place somewhere. I always find when things come *home*, people *feel* it the best, or rather the most.

I fear that a little knot of you first-class professors has at last got touched in the quick. If so, have a little feeling for us poor from-hand-to-mouth brethren.—I am, yours, &c. DIPPER.

[We are most willing to allow all classes of our readers a fair hearing, hence the insertion of the preceding; but we cannot abstain from replying to some of the remarks made.

If any of the *first-class professors* have been "touched in the quick," they must be those personally unknown to us; and at any rate our correspondent ought to know, if he has been a reader of the Journal for any length of time, that we endeavour to uphold truth and justice, without respect of persons.

"Dipper's" complaint, that the journals have produced such a crowd of skilfull amateurs that professionals cannot get a living by following the art, is at any rate complimentary, though unjust; for he omits to mention also that nearly all professional photographers were originally amateurs. Moreover, were it not for the journals, what would photography have now been? It never could have acquired its present development without the facility of that free intercommunication between its followers afforded by the journals. That many miniature painters have suffered from the advance of our art, is probably true: there never was any great change effected without some individual injury. But we have reason to believe that many more are now earning a comfortable livelihood by making photography an ally instead of an opponent.

The parallel drawn by our correspondent between the amateur and the government department is inapt, because the former buys his own materials and apparatus, and gives away his productions—a proceeding to which he has a perfect right: if he sells them he becomes a professional, and either makes a fair profit or ceases to sell—in either case there is no unfair competition. This is not so with the government department. The professional photographer himself assists in finding funds to enable the government department to undersell him. If he do so voluntarily, we have not the slightest objection; but if not, then we protest in his behalf, for, personally, the matter does not affect us in the smallest possible degree.

We fancy that the "Belgravian puppy," so graphically described by "Dipper," is more of a friend than a foe to him and his brethren; for "rich friends" who have been once "taken" somehow or other generally get a hankering after the operation, and spend twice as much upon being "done" over and over again as those who have never had a gratuitous taste. Either the friend's handiwork is so good that the sitters are delighted, and take all the rest of the family to a "professor," or it is so bad, that they go to the said "professor" if only to show the amateur friend that they (the sitters) are not quite such "Guys" as the photographic friend would lead them to believe.

We come in contact with photographers—professional and amateur—from all parts of the kingdom, and, whenever the question has been discussed at all, we invariably find that the former succeed best, in a commercial point of view, where the latter most abound.—Ed.]

EXPLANATION.

To the Editor.

Sir,—On looking over the last number of The British Journal of Photography I find my name brought into print, and felt somewhat annoyed, not on account of myself, but for the different authors of the "dry processes," who, no doubt, will think, on reading the article in question, that I am a sad bungler, and, before I had attempted to give any opinion, ought to have been able to work some of the said dry methods. The error in question commences with the "hot water," and, for your guidance, I give you almost word for word what I really did say:—

"He had tried a few plates by this process, and found them satisfy—so much so that he thought he could obtain equal results with this as with any other process, and quite as rapid. The only fault he found was a kind of watery mark along the edge; in fact, he might say that he was liable to this kind of marking *more or less* in all the dry processes he had tried. He had brought a negative with him, prepared by the hot water, showing these marks, and wished to ask if there were anyone present at the meeting who could throw any light upon the subject."

You will perceive that the foregoing is quite a different edition to yours. I have made inquiry as to who was the author, but have not got any definite answer. I should not have troubled you, but our next meeting does not take place in time to prepare a report for your next impression; however, I shall bring the matter forward.—I am, yours, &c.,

Manchester, Nov. 12, 1860. THOS. T. SHEARD.

[We are not responsible for the error complained of, having only published the official report.—Ed.]

PREVENTION OF BATH-TOPS ADHERING.

To the Editor.

Sir,—At a recent North London meeting, Mr. Hill and others complained of the tops of their gutta-percha baths sticking. Will you allow me to suggest the use of a thin strip of parchment paper (De la Rue's make), obtainable at Goods', 60, Moorgate Street? The solution has no effect whatever on it, and, of course, it cannot stick. Mr. Simpson's plan is a very good one: to face the rubber on the top with a thin strip of the purest gutta-perha. I have used a travelling glass bath, holding 180 ounces of solution, all the summer!! (such as it has been), with a top of the same sort, with the most perfect success, and without the slightest leakage.

I am delighted to see what Mr. Hughes and others say about the system of rolling albumenised paper, and trust it may be the means of inducing the albumenisers to give up so pernicious a system.

I am, yours, &c. R. GORDON.

SELF-ACTING WASHING APPARATUS.

To the Editor.

Sir,—A gentleman with whom I am well acquainted has his house furnished with a number of ingenious contrivances for the promotion of health, comfort, and convenience. One of these gets over the difficulty experienced by some of your correspondents in constructing a washing vessel that shall be slowly filled and rapidly emptied without personal attention.

About forty feet above the ground is fixed a cistern holding 250 gallons of water, which is discharged once or twice a day through a four-inch pipe into the drains of the house, the amount and force of the current driving every impurity into the sewer.

The pump which supplies the water is worked by a steam engine that is kept going for business purposes; and when the cistern is full, a waste-pipe conveys the surplus into a vessel suspended like a scale-pan from one end of a lever, to the other end of which the valve that covers the orifice of the exit-pipe in the bottom of the cistern is attached by a wire. By a proper adjustment of the size of the suspended vessel, and the axis of the lever to the weight of the valve and the pressure it sustains, the latter is raised and the cistern emptied. In the suspended vessel is a *small* hole, which allows the water *slowly* to run out, when the weight of the valve again preponderates, and it falls on to its feet.

As my experience in washing prints is very limited, I am unable to give an opinion on the respective merits of a change of water in the same vessel, and the lifting of each print singly by hand into another vessel; but, if automatic washing is found to answer, I think an apparatus might be constructed upon the above principle, which would change the water with certainty and regularity. The valve might be made like the clack of a common pump; and, if the vessel were shallow, it would require but little force to lift it.—I am, yours, &c., J.

THE GRAND-PARENT SOCIETY.

To the Editor.

Sir,—Now, I hope I don't intrude, but I thought I'd just drop in to say I've patented it. Of course I mean my celebrated apparatus for keyhole photography.* The idea developed with the first picture I took beautifully; but, however, that's not what I have to say. No! My intention now is to inquire why, when you regularly report the meetings of the Parent Society, I never, by any chance, find in your pages any notice of a society, of the existence of which I had not till quite recently any idea—I mean the Grand-parent Society?

On the evening of November the 6th I was in the Strand, on my way to the first ordinary meeting of the Photographic Society's new session

* See No. 110 of The British Journal of Photography.

(I mean the Parent Society), in Coventry Street, when, behold! I saw a group of photographers (marked men, for their fingers were stained) turn out of the street thro' an archway of stone, and vanish thro' a large door to the left. Ha! said I, what does this mean? These men should be going to Coventry Street, and they are going—where? Egad, thought I, I'll find out; so I followed them.

Now, when I reached the door to the left, I saw a stone hall, and a staircase, but those I sought were invisible. Where could they have gone to? I saw another little man, and I said, "Can you tell me if a Photographic Society, named after any of the points of the compass, holds a meeting here to-night, sir?" For I knew of the South and the North, and thought there might be some unreported East or West Societies, don't you see? And the little man, with great dignity, paused in ascending the stairs, and looking down on me said, "*No*, sir, no such *little* societies meet *here*;—this is the *great*, the Grand-*parent* Society. "Can I attend the meeting?" said I, informing him at the same time that I was a member of the Parent Society. Whereupon, in a most mysterious manner, he ejaculated "Walker!" winked at me, and went upstairs. I stared after him in confusion, but imagining that "Walker" might be his method of expressing "walk up," I followed him.

I'm rather near-sighted, you must know; so I soon lost sight of this eccentric little man, but found my way into a room in which there was, as I was informed, a photographic meeting.

A paper had evidently been read, and a discussion was progressing which rather puzzled me until I remembered a certain proverb in connexion with female grand-parents generally.

The Chairman was just saying that he was not so certain as Mr. (I didn't catch the name, but say Blank)—not so certain as Mr. Blank that the small end of the egg was the proper point from which to extract albumen, for he recollected that an old relative of his own invariably applied her lips to the larger end.

Mr. Stars had a few words to say upon the possibility of sucking both ends of the egg at the same time, and said them.

The Chairman said to a philosophical mind there could be no doubt of the fact.

Mr. Ox said he thought there would be some difficulty in applying the lips to both ends of the egg at the same time.

Mr. Blank explained his previous remarks, and said that by moving the head from side to side it might be accomplished. He denied that you could suck up and down.

The Chairman thought one *could* suck up and down at the same time.

Mr. Blank said there was a proposition in Euclid which was indisputable, viz., that two and two made four.

The Chairman said that if you added nothing to two you might make twenty, when two and two would be twenty-two; but thought these purely scientific questions hardly worth discussion.

Mr. Dash sucked an egg.

Mr. Yous thought it very strange that they should have to discuss sucked eggs.

Mr. Ochhone thought there was some misunderstanding on one point: he thought the taste of the albumen ought to govern them.

Mr. Blank thought everybody was botheration and conglomeration.

But I merely quote the words of these speakers to show how worthy of appearing in print these meetings of the Grand-parent Society are.

I am, yours, &c., PAUL PRY.

Kew Rye House, Nov. 21, 1860.

P.S.—A friend informs me that it was not the point of *suck*, but the "point of *sight*"—not *sucking* up and down, but *seeing* up and down at the same time, that was discussed. However, the difference is by no means material.

P. P. P., and P. of P. K. P.

ANSWERS TO CORRESPONDENTS.

Erratum.—In Mr. Hughes's paper on the mounting of lenses, which appeared in our last, the first and fourth diagrams were accidentally transposed by the printer. It is, however, a matter of but slight importance, as the *letters of reference* indicate correctly the several diagrams given.

*** Every now and then we receive an extra number of letters, asking for private replies. We have to repeat constantly that we cannot give answers to photographic queries, except through the medium of the Journal. It is not reasonable to ask for such; and we take this opportunity of stating that any postage stamps that may be enclosed, in order to *force* a private reply, will be confiscated without remorse.

H. Hopwood.—You will find the question discussed in the present leader.

Received with Thanks.—P. Le N. Foster.

Micro-Photo.—Undoubtedly, if you supply also a microscope with which to view them; but not otherwise.

J. Blackwell.—Your fault is, insufficient washing after the albumen. Use plenty of water, and the markings which now trouble you will disappear.

R. F.—We would with pleasure afford you the opportunity you desire if you were in London at the time. Possibly you may be able to attend on a future occasion.

Theta.—Put a little acid into your sensitising bath for albumenised paper. You may add alcohol, if you desire it.

Amateur Mechanic.—A piece of *clean* yellow deal (free from knots) is as good a material as you can possibly use for making a tripod, particularly if varnished; it is strong, rigid, "*stands well*," and is not heavy.

Multum in Parvo.—We do not perceive what real gain there is in your proposed arrangement, so far as your description explains it. If you like to send a sketch we will examine it.

Tyro.—You should make yourself acquainted with the elementary principles of chemistry. You will find many things in photography very difficult to explain unless you have some knowledge of the laws and phenomena of chemistry.

Novice.—You had better procure the little manual, by Hennah, on the Collodion Process, published by Knight and Co., Foster Lane, Cheapside, London.

J. M.—Your bath is too acid; rectify it by the addition of oxide of silver. It has most likely become acid by the use of collodion containing too much free iodine, which is apt to be the case when *old* collodion is employed, as you say you have been doing.

A Rifleman.—The ranks of riflemen have been swelled by many photographers; it is, therefore, but "poetical justice" that we should gain a few recruits from the riflemen. Inquire amongst the members of your corps, and we have little doubt that you will find one or more who can introduce you.

Lloyd Chapman.—We cannot perceive anything unreasonable in Mr. Hughes's remarks, which were expressed at one of the meetings of a London Society; and, as the official organ of that society, we simply recorded what took place. The anonymous extract from a letter which you include in your communication, though perhaps admissible in an advertisement, would be misplaced in our columns.

Jas. Kendall.—For the plain collodion, take pyroxyline 90 grains; ether, s. g. 0·723, 6 fluid oz.; alcohol, s. g. ·816, 2 fl. oz.; alcohol, s. g. 0·800, 1 fl. oz. Of the preceding, take *six drachms*, and add to it *two drachms* of iodising solution, made thus, namely:—Alcohol, s. g. ·816, 2 oz.; iodide of potassium 16 grains; iodide of cadmium 13 grains; bromide of cadmium 5 grains. Your sensitising-bath should be made of very pure nitrate of silver, re-crystallised twice, or even thrice, and should be very nearly neutral. Your communication shall appear in our next.

R. T. D.—You are not likely to obtain much greater sharpness (if any) with calotype paper negatives than the specimens sent by you. They are by no means bad of their kind, and calotype is only fitted for large-sized portraits. The front lens of an ordinary portrait combination is *not* the best adapted for landscape work. It is not necessary to have the lenses of a stereo-camera for landscapes arranged to vary their distance. You can always obtain any amount of difference in point of view, when desirable (if ever), by shifting the camera and exposing one half at a time.

Fog.—1. You have simply added a slight excess of the carbonated alkali. Remedy the defect by adding, drop by drop, a little dilute hydrochloric (muriatic) acid, shaking the mixture between each addition, and you will find the cloudiness disappear.—2. You should not attempt to remove spots on your brass work by means of brickdust, which only scratches off the lacquer, and makes matters worse. You had better get your mounting re-lacquered; and if needful, on another occasion, a damp cloth, followed by a dry leather, will be your mode of cleaning.

A Constant Subscriber.—1. We have had no personal practical experience in the Daguerreotype process, but we believe that the tarnished plate can be renovated by immersing it in a weak solution of cyanide of potassium, washing in distilled water, and then drying over a spirit lamp, with the usual precautions in drying a Daguerreotype plate.—2. Positives are not capable of conversion into good negatives, especially after being dried; but, perhaps, the best method is by covering the plate (after having previously moistened it all over) with a solution of perchloride of mercury. It then becomes whitened all over. Wash copiously and freely; drain slightly, and then cover with weak hydrosulphate of ammonia, which turns it of a brownish hue; finally, wash freely and dry.

A. J. B. (Halstead)—Your annoyance is a case of partially *reversed action*. The cause may be found in the concurrence of several influences tending towards the same direction, namely, organic matter in the bath (acetic acid, for instance), the impact of *faint* white light before exposure, or during exposure, or, what is still worse, *during development*: the addition of a minute portion of hyposulphite solution would be apt to produce it, though we do not anticipate this in your case. Commencing to develop, and then before any picture appears washing off, and again developing, will also produce it. Sometimes very protracted exposure in the camera will cause it. The probability would seem to us that, in your case, the dark room is in fault; the yellow material protecting your window has probably faded, and lets in a little ordinary light, which, if the development be long about, would be very apt to produce the defect.

A. G.—1. How is it possible for us to indicate who was meant by No. 1 in the reply to which you refer? We do not keep letters from correspondents beyond the time when they are answered, or we should by this time have a tolerably large room full of them. The number referred to a list, but what names were contained in that list we do not now know. You have also misread the reply which we gave. We stated nothing like what you have imagined, but simply asserted that by taking A instead of B the inquirer would accomplish his object with an exposure of fifteen seconds instead of twenty seconds—the letters A and B standing for two lenses about which he made inquiry for a certain specified object.—2. Your roller does not act upon the same principle as the lithographic press.—3. Fothergill.—4. If you have the middle lenses, we do not perceive what "fitting" they require, as they are already adapted to their proper place; but, at any rate, if you send them to any one, you had better do so to Mr. Lloyd Chapman, 27, Broad Street Buildings, London, the authorised agent of the maker.

Curious.—The small quantity of nitrate of silver would act very injuriously. Phosphate of soda is not an alkali, but a basic neutral salt. Chloride of gold is, in fact, a terchloride with an excess of hydrochloric acid; and it is of the utmost importance in Lyte's process of toning that it shall be neutralised before adding it to the phosphate of soda, otherwise that salt is partially decomposed. The neutralisation of the gold salt is very readily accomplished by adding carbonate of soda, thus converting the former into a double chloride of gold and sodium, and setting free the carbonic acid, *which, being gaseous*, disappears from the liquid, whereas with the phosphate of soda the phosphoric acid would remain. The hyposulphite of soda does not attack the gold (at least to any injurious extent), which is substituted for the silver in toning; but, if added to the toning bath, it is apt to combine with the reduced silver, sulphuretting it, and thus preventing the action of the gold thereon.

R. G.—We regret exceedingly to learn from you that the amateurs in your locality are not communicative. It displays a spirit of illiberality that would not be found in the metropolis. Your specimens are very commendable so far as manipulation is concerned, though not perfect even in that respect; but artistically they are atrocious. If you were to fold the portrait of the lady longitudinally, one-half would exactly match the other. You have not an atom of shadow, and consequently your picture looks as flat as a pancake. Arrange your sitter so as to let the light fall more on one side than the other; let the eyes be directed to some object towards one side or other of the camera—not staring straight at it; let the pose be natural, and it will most likely be graceful. The gentleman, though not so symmetrical as the lady, is far worse, because more constrained and rigid. A full face very rarely looks well in portraiture, and *never* when the whole body is likewise turned towards the spectators. You will generally find that what is called three-quarter face looks best. You little know the demands upon the time of an editor, or you would not ask for a specimen. We recommend you, however, to procure one from Messrs. St. George and Co., 31, Gloucester Place, Kentish Town, N.W. They are photographic printers; and we saw recently in their possession some proofs of card-portraits beautifully toned, and in which the figures were gracefully posed. We have no doubt that you can obtain, at moderate cost, exactly what you require from them.

Received.—Thos. G.—T. S. D.—Watkin—R. T. D.—A. M., and W. Strudwick.

*** We have received such a mass of valuable matter from various correspondents that we are compelled to postpone a large portion until our next, notwithstanding we give in this number eight extra pages of matter. We have to crave the indulgence of many whose contributions are marked for insertion or actually in type.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this* Journal *should be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 132, Vol. VII.—DECEMBER 15, 1860.

With each copy of this number of the Journal we present an Almanac for the year 1861, adapted for carrying in the pocket-book, and containing many useful photographic formulæ and memoranda, which we trust will be found handy and convenient for consultation at any moment. With it we would offer the "compliments of the season," but we fear that we run some risk of being asked whether we mean umbrellas, goloshes, and top-coats.

Truly the year now passing away has been one unprecedentedly antagonistic to our art as regards the weather; but, according to the old saying, "when things are at the worst they must mend:" we hope for a better future. But if the practice of our art has been impeded, we cannot say the same of its literature: our societies have been unusually active, and our Journal full to overflowing. The latter may be a consequence of the former.

In order to meet the constantly increasing demands upon our space, the publisher has not hesitated, when requisite, to give several extra pages of matter; but so frequently has this concession been demanded of late, that the exception became the rule, and upon one occasion when we managed to dispense with it the circumstance elicited an expression of surprise. With the extra matter, extra expense to a large extent has been incurred; but subscribers have not been taxed in any way to meet the outlay: casual purchasers alone, when resident in the provinces, have of late had to pay an extra penny per number. We find that we have now reached a point when we are demanding still further extension of space. But our hitherto uncomplaining publisher is at length obliged to remonstrate: forbearance has its limits, and we have too far o'er-stepped its bounds.

We are unwilling to check the tide of photographic literature, which we believe has afforded pleasure and instruction to all concerned, and therefore it has been found necessary for the future to raise the price from threepence to fourpence per number in London and Liverpool, in accordance with the price now charged elsewhere—a change to which we hope and believe few of our readers will object, as they certainly receive more than a *quid pro quo*.

The subscription to this Journal in future will, therefore, be—for unstamped copies, 8s. per annum; for copies to go free by post, 10s. per annum,—*payable in advance.* Where credit is demanded or taken, 10 per cent. additional will be charged.

"Behold! how great a matter a little fire kindleth!" Who could have predicted that a quiet question, put by a quiet member of a suburban photographic society during a discussion on the *construction* of photographic lenses, would have been the cause of such a "hubbub" as that to which it has given birth?

In our report of the October meeting of the South London Photographic Society (page 319), we find one of the members, when commenting upon a paper that had been read by Mr. Hughes, employed the following words, viz.:—

"With reference to the use of the bayonet joint in Derogy's lenses, he did not consider that it would make the axis of the lens, when reversed, so true as the screw-joint. Every lens ought to be inserted in the *cell whilst the other portion of the brass-work was in the lathe,* so as to cut the thread of the screw and the cell at the same time. The slightest thing would throw the axis out."

After the preceding, several other remarks were made relative to other points in connexion with the lenses before the meeting, when, returning to the question of centering, a member asked "how they could tell when the axis of a lens was central?" to which the reply was, "*that was a trade secret—one of the important secrets only known to a few.*"

In our leading article we noticed this singular reply, and explained *the method in actual use* for centering lenses during their construction by two of the most celebrated English makers of photographic lenses, and all the first-class makers of microscopic object glasses; and we may remark that to centre the former is mere child's play as compared with the latter, which not unfrequently contain as many as eight and sometimes even nine distinct lenses in the combination. We stake our reputation on the accuracy of the assertion which we made, and are sceptical about any superior method being known for this purpose, notwithstanding the mystification attempted at the last meeting of the same Society to which we have already referred—a report of which appeared in our last, at pages 533 and 354, and to which we request our readers' attention.

Our good friend, the President of the Society, evidently tried to "let us down easily," by calling our description a *rough* method, and intended only to apply to view lenses; but we repeat that no such limitation was contemplated by us, and that the method described is that exclusively in constant actual use by opticians of the highest reputation for compound lenses of all kinds.

It has been sought by the gentleman upon whose reply we commented to convert the question into one very different to that recorded by our reporter, viz., "how photographers could tell when a portrait combination is properly centered?" But a simple reference to the context refutes this interpretation; and if it did not, the reply would have been to such a question irrelevant. There is no individuality in the question—no special emphasis *ad hominem*, "how do *you?*" &c., as implied by the non-content at our explanation in his subsequent animadversions. It is easily enough ascertained by photographers with sufficient accuracy whether their lenses be centered or not, by viewing the flame of a candle through the lens, and making the nearest reflected image (of which there will be as many as there are surfaces) eclipse all the rest: if any will not come into the general line, those surfaces which reflect them are ex-centric as regards their axes. Again, by viewing the flame as before and unscrewing one of the combinations, the flame will appear to "wobble" if either be not centrical. These, however, are but

rough tests—still quite enough for the generality of photographic lenses when already made.

We find on reference to the records of the discussion (p. 353), the mild (!) assertion that "it *frequently* happens that not more than *one* lens out of *six* is centered properly," &c. Again: "There are *two* makers whose lenses are properly centred; hence I infer they know this trade secret." We do not know what interpretation most readers would place upon these words, but to us it certainly appears intended to convey the impression that there are *only two* manufacturers of lenses besides the speaker *who understand their business*. But as we cannot suppose that the speaker really meant to make any such preposterous assertion, we can only fall back upon our previous conjecture, and, notwithstanding his disclaimer, come to the conclusion that he really was joking after all.

In conclusion, if the gentleman who has necessitated our making these observations feels himself aggrieved, and desires to reply, we freely place our columns at his service, and give him *carte blanche*, not only to say what he likes, but also to have the last word. "*Vive la liberté!*"

We cannot forbear calling the attention of our readers to the very valuable and interesting communication of our friend and coadjutor, Mr. Hardwich, being No. 15 of his "Photographic Comments," in which he details the result of his examination of half-a-pound of impure nitrate of silver, procured by him in consequence of some remarks by "S. H.," published at p. 242 of the current volume.

There are two points in the communication above referred to especially worthy of being noted, having a very important bearing upon the practice of the collodion process. The first is the fact that negatives taken upon plates sensitised in a bath prepared from the contaminated nitrate of silver, exhibited all the appearances usually attributed to the presence of excess of free nitric acid in the bath—the actinic action being greatly retarded, and the resulting negative weak and poor, while it is noteworthy that precautions were taken to neutralise all nitric acid that might have been present. From previous experience it was suspected that the defects were due to the presence of *organic matter* of some kind, and subsequent experiments confirmed this conjecture.

At the first blush it might appear strange that the presence of organic matter, which usually adds materially to the density of a negative developed under its influence, should in the instance mentioned tend to weaken it; but on considering carefully how the seeming discrepancy can be reconciled, Mr. Hardwich is of opinion that in the case of the impure nitrate of silver the organic matter is probably in a state of oxidation, and in those where it acts as an intensifier the reverse condition obtains. Be this as it may, the fact of the impurity consisting of organic matter is unquestionable, no less than its deteriorating influence. The other point of moment demanding special record is the antidote for the bane already noticed, viz., that by the addition to the collodion of a bromide as well as the iodide which it already contained, a fair picture was capable of being produced, even with the impure bath, which when the simply iodised collodion alone was employed failed to allow of the impression of any of the details in the shadow. These are facts that by the intelligent operator should never be lost sight of, especially when we reflect that, according to the reliable testimony of Messrs. Hopkin and Williams, no less a proportion than 25 per cent. of commercial nitrate of silver contains so much organic matter as to render it unsaleable by the conscientious dealer.

While on this point we may as well correct a typical error which was accidentally overlooked in Mr. Hardwich's paper. At line 17, p. 343, "nitrate of silver decomposed" should read "nitrite," &c.

We have to mention the formation of a new Photographic Society which has recently been called into existence at Bradford. The inauguration meeting was held on the 2nd ult., and the report of the first ordinary meeting, which took place on the 5th inst., will be found under our usual heading.

An advertisement, which will be found in the usual column, announces that all pictures intended for the forthcoming Exhibition of the London Photographic Society should be sent to the Gallery, 5, Pall Mall, on the 27th instant.

ON PRINTING, TONING, AND FIXING PHOTOGRAPHIC PRINTS.

By A. Macnab.

[Read before a meeting of the City of Glasgow and West of Scotland Photographic Society, on December 6th, 1860.]

In accordance with the resolution passed at our last meeting, I now beg leave to open the discussion on the subject of *Printing, Toning, and Fixing Photographic Prints.*

From the papers published lately in The British Journal of Photography, from the able pen of C. Jabez Hughes, and also from those recently read before this Society's meetings by Messrs. Stuart and Ewing, one might readily suppose the subject is now pretty well exhausted, and but little remains of general or particular interest.

Aware of the difficulty of keeping alive or sustaining an interest at the fag end of a subject already shorn of its strength, I purpose going through a few experiments upon the recovery of silver from the washings of prints, adding, by the way, a strong recommendation to every one largely engaged in printing, *i. e., to make their own chloride of gold.*

Before doing so, however, allow me a few remarks of a general nature, *en passant.*

That the subject is full of interest in a practical point of view few of us will I presume question, and the more light brought to bear upon it the better—an operation simple to look upon, yet with results that are striking and decided, whose success is the necessary consequence of years of anxious labour and thought.

Although I may not be adding my mite to the general stock of knowledge already possessed by the members of this Society, I crave your indulgence to any statement or remark that I may make to-night at variance with those already advanced. We may err in our opinions and manipulatory details; but it remains for you to judge of, and adopt, the better way. My scraps of experience, such as they are, are given to you in sincerity and candour, undisguised by technical terms, and wholly unvarnished. It is but a stale repetition of the old proverb, that "doctors differ," and why not photographers. The practice of our noble art embraces a wide field for thought and research—new and ever varied forms recurring to note the different phases they are ever assuming, and appropriate the happy accident of some hitherto undeveloped property of chemical combination. These ought to be the first care of every one who has the progress of his profession at heart.

It forms no part of my purpose to enter upon the details already discussed in the former papers—such as the selection of paper (which, by-the-by, cannot be too carefully done), washing the dishes, strength of silver, manner of laying down the paper, time of floating, and how to hang up and dry. All this has been fully described. I would observe, that if the paper be highly albumenised, and possess a very highly glazed surface, it will frequently appear as if it were greasy after its removal from the silver bath. The silver first runs in parallel lines: after a time they break up into small spheres, and, if allowed to dry, would produce a mottled spotty picture, as though it had been sprinkled with rain drops. This is easily prevented by allowing the paper to drain well, and taking a small piece of French filter paper, folded like the blade of a fan, with which carefully go over and break all the dew-drops—if I may so express myself—as the paper has all the appearance of *perspiring* freely. By this simple method good solid prints will be produced. Neglect this simple precaution, and a hundred to one but your prints are covered with spots. I am particular in calling your attention to this, as I have not been troubled with it when the paper has been open or porous.

For negatives thin and full of half-tones I prefer highly glazed albumenised paper, and printed in bright light. This frequently gives good results, when otherwise they might prove failures. For negatives rather dense, giving pretty decided contrasts,

I prefer using an open, porous paper, and printed in slow light. Soft and often beautiful prints are to be obtained in this way by a little management and general precaution.

The prints once printed are carefully preserved from the light: they are then first floated upon clean water for some ten or fifteen minutes, and then changed to another dish, and floated for say ten or fifteen minutes *longer*. They are then removed to a *third* dish, and immersed for some time, previous to being toned. I do not require here to recapitulate this part of the operation, so fully discussed in former papers.

It is of importance that the gold should be of first-rate quality. I have had great difficulty in purchasing gold which gave me as fine results as the chloride of gold of one's own making. It is much cheaper, by more than one-third; and goes a greater way in toning, and gives richer tones. You can purchase pure gold for twopence per grain. Fifty-six grains in Australian nuggets will cost 9s. 4d.: this will produce chloride of gold of about eighty-six grains, which, at twopence per grain, will be 14s. 4d., showing a clear saving of five shillings, besides having a genuine article that can be depended upon.

I may here give the formula for making the chloride of gold, as contained in Hardwich's *Chemistry of Photography*, pp. 451, 452:—

"This salt is formed by dissolving pure metallic gold in nitro-hydrochloric acid, and evaporating at a gentle heat. The solution affords deliquescent crystals of a deep orange colour.

"Chloride of gold, in a state fit for photographic use, may easily be obtained by the following process:—Place a half-sovereign in any convenient vessel, and pour on it half a drachm of nitric acid, mixed with two and a-half drachms of hydrochloric acid, and three drachms of water; digest by a gentle heat, but do not *boil* the acid, or much of the chloride will be driven off in the form of gas. At the expiration of a few hours add fresh *aqua regia*, in quantity the same as at first, which will probably complete the solution; but, if not, repeat the process a third time.

"Lastly, neutralise the liquid by adding carbonate of soda until all effervescence ceases, and a green precipitate forms. This is *carbonate of copper*, which must be allowed several hours to separate thoroughly. The chloride of gold is thus freed from copper and silver, with which the metallic gold is alloyed in the standard coin of the realm. The solution so prepared will be *alkaline*, and, consequently, prone to a reduction of metallic gold: a slight extra quantity of hydrochloric acid should therefore be added, sufficient to redden a piece of immersed litmus paper."

The recovery of silver from the washings of the prints—to be rendered easily available—is another important point. There are several ways by which this can be done: by copper, by hydrochloric acid, by salt and liquor of potass, or caustic potass. The two last I prefer, from the lesser trouble connected with the recovery of the silver, which can easily be reduced and re-crystallised

ON A NEW METHOD OF DECOLORISING THE ALBUMEN SILVER BATH.

By Mr. Tunny.

[Read at a meeting of the Photographic Society of Scotland, on Tuesday, Dec. 11, 1860.]

All who have been accustomed to print upon albumenised paper must have felt the greatest inconvenience to be a rapid deterioration of the silver bath, rendering the prints mealy and rather scummy upon the surface. This, to a certain extent, has been remedied by the use of animal charcoal and kaolin. No doubt the filtration of the silver bath through these substances frees it from colouring matter; but the large quantity of phosphate and carbonate of lime they often contain renders the bath strongly alkaline; and, also, the strongest bath will, after their use, be found to be very much diminished. The practical photographer, who weighs out his silver by ounces instead of grains, is very sensitive to this fact. In order to lessen the one and remove the other, I instituted a number of experiments for the attainment of this object; and I am glad of this opportunity of informing the members of our society that I have been successful, not only in clearing the bath from its inky blackness, but also in imparting to it the property of permanently retaining its restored crystalline purity.

I have here a bottle of nitrate of silver solution, which has been used for the purpose of exciting albumenised paper. It is not so black as I would have liked it for this experiment; but sufficiently so, I dare say, to illustrate the ease with which it can be purified. The solution is slightly alkaline, as may be demonstrated by the test paper. I now put into this silver a drop or two of a *saturated solution of citric acid*.* A drop or two is quite sufficient for a considerable quantity of fluid. You will now see taking place a flocculent deposition, which is citrate of silver, and that this is nearly all re-dissolved by a little shaking. All that is now required is simply to filter, in order to have the silver as pure as when it was first made into solution.

It will be found, on examination of the filter paper, that there is nothing to be seen but a slight discoloring of the paper. Now to test paper it is slightly acid, which is the best condition of bath to give vigorous prints. It will be seen that paper sensitised on an alkaline bath will be found wanting in vigour, when compared with prints which have been prepared by a slightly acid bath.

In connection with this, I will, on another occasion, take an opportunity of bringing before you a modification of the ammonio-citrate of silver bath for sensitising albumenised paper, which gives a beautiful tone of colour, even without the use of gold. And here I would just mention to those who have not had much experience in toning with gold, that it is of the utmost importance in successful toning not to have the bath strongly alkaline: all that is required is that it be merely neutral. All the prints I have sent out for the last ten years have been toned with a neutral gold bath. As to the permanency of prints, no matter how they are toned, if they are not sufficiently washed with boiling water, I have great fears of their ultimate destruction. I think this fact cannot be too often brought before the professional photographer, as I fear, in many cases, *permanency* is too often sacrificed to a desire for black tints.

* We have an impression that Mr. Tunny has been forestalled in this application of citric acid, the same having been brought before the London Society about twelve months ago, if our memory be not at fault.—Ed.

A FEW WORDS ABOUT THE MANAGERS, EXHIBITORS, AND CRITICS, OF OUR PHOTOGRAPHIC EXHIBITIONS.

By Alfred H. Wall.

Let him not degenerate from serving Art, the Queen,
To a preference for her handmaids, the Sciences.
The Bee and the Worm excel him in diligence
And mechanical craft; the Seraph in knowledge;
But art is man's alone.

Schiller's *Poem of the Artists.*

I am addressing more particularly the members of our Photographic Societies, who, from a pure love of our art, and an unselfish desire for its improvement and advancement, have given up their time to meetings, and expended their money in experiments, in a manner as honourable to themselves as it has been advantageous to the profession at large; for I am convinced that it will only be necessary to publish any hints tending to the advancement of the art and science of photography to secure for them due attention and impartial consideration.

A recent writer in a contemporary, with ungracious, ungrateful, and unthinking smallness, attempts to sneer at these societies, and seems to think that the fact of each gentleman speaking about a subject he best understands, or, as he says, playing upon his own particular "brass kettle," deserves reproof; whereas the great evil in our societies will be found in those who, like the writer in question, occasionally insist upon speaking on subjects they know nothing about. But this is apart from my subject.

The experience of modern times has fully demonstrated the great power and value of our periodical art exhibitions. Their history would take us back comparatively but a few years; and yet how rapid has been their growth in importance, power, and number.

In 1768 one picture exhibition only, that of the "Incorporated Society of Artists," could be found in London, and this solitary institution was by no means of a great or flourishing character. From this, however, sprang others which, gradually improving from year to year, have done more for the spread of good art and public taste than can be traced to any other source; and we well know British art now occupies a higher position than it ever claimed before, and at the same time art expositions are more successful and more numerous than they were at any other period. More pictures found purchasers, and more visitors attended our exhibitions, during the last art season than could be recorded of any previous year, and at the same time the Royal Academy secured the largest sum its exhibition has ever yet produced, viz., £11,000.

Not only is this very encouraging to all lovers of, and believers in, art, but it shows how intimately the progress of art is connected with that of our exhibitions.

I wish to impress the above facts earnestly upon the members of our photographic societies generally, but more especially upon such as belong to the older or, as it is commonly called, the parent society. To their generously fostering care is entrusted the welfare,

education, and future character of our beautiful infant art, the development of which is, as I have tried to show, in no small measure dependent upon our exhibitions.

When the parent society—culpably neglectful of the artistic branches—has spent its time in studying to improve the mechanical, chemical, or optical appliances of photography, and begins to contemplate preparing for the annual exhibition, it should be far from regarding it with the ignoble spirit of a showman, anxious only for the shillings it will bring in; but should remember how potent for good or ill the influence it will exercise must be upon the public mind. The old proverb says, "Give a dog an ill name and hang him;" and, of this we may be sure, that directly any art becomes degraded in public estimation it speedily sinks even below the level assigned it.

One feature of our exhibitions has hitherto been neglected, viz., the proper classification and arrangement of the specimens, so as to illustrate the wide range of applications to which photography has extended. It does not suffice to advertise an appeal to exhibitors, and then merely hang up their productions, with as little reference to their widely varying characters and pretensions as would be displayed in promiscuously jumbling together a mass of the most heterogeneous articles; for such a process must be as injurious to the art itself as it is unjust to exhibitors at large.

Let works which aspire to the character of artistic productions be subdivided into their various branches, and grouped together. Let other specimens, valuable as purely scientific agents, whether as illustrative of geological principles—of medical, botanical, or chemical studies—of comparative anatomy, archeology, architecture, or other scientific pursuits,* receive the same treatment, and the result must be in every way advantageous to the public, the society, the exhibition, and to photography itself.

If photography be really an art—as is now more generally asserted and believed—why should it be treated as a something purely mechanical, or purely scientific, and exhibited to the world with no more care or study than is thought necessary to opening the door of a common show upon some wonderful giant or dwarf, or some ingenious piece of mechanism? The mere fact of this exhibition existing, as it does from year to year, and being supported as it is by those who chiefly value it for its pictorial attractions, prove the necessity for this classification of the specimens exhibited, and set the seal to its pretensions as an art exposition.

In creating competition, and raising the standard of taste by the organisation of the London Exhibition, the parent society founded a just claim to our hearty thanks, and did more for the advancement of the art and the welfare of its professors than has been effected by all the many papers and discussions brought forward at its subsequent meetings. But the mere establishment of this exhibition will not prevent its decline, if it fail to keep pace with the improvements of the day

Picture buyers look to our picture exhibitions for their purchases, because, by carefully excluding all works below a certain standard, such institutions have acquired a character which is in itself a sufficient guarantee for the artistic quality of any pictures selected from their collections. Now, there are very few who will deny that certain photographs appear each year in *our* exhibitions that are as discreditable to the art as to their producers, and which tend to lower the dignity, decrease the utility, and mar the progress of photographic exhibitions. Every work should have its individual and relative merit, according to its classification; and the committee appointed to make choice of and hang the specimens should be composed of the best qualified members of the society concerned. Thus will patronage be directed into the best channel, the best reward await the highest merit, and the best interests of the art our societies were publicly organised to advance and support be properly and nobly served. There is, I know from professional experience, much carelessness among exhibitors as to the character of the specimens sent for "the exhibition;" many sending not their best and some their worst, because most easily spared, specimens for the purpose. That those who so acted were shortsighted and foolish to their own interests is true enough; but, nevertheless, so stands the stubborn fact, and I can but point out where the responsibility lies. You, as well as I, have doubtless seen bad specimens exhibited in the Societies' rooms by those who were exhibiting very superior things elsewhere. And I do not think it can be doubted that the positive refusal of such contributions, by a society having a position in public estimation which rendered its approbation a matter of commercial importance, would soon bring forth others of a very superior character.

* There will, of course, be various other subdivisions.

Having thrown out these few suggestive hints, humbly, and by no means in a spirit of dogmatic criticism, let me add a few words for our exhibitors.

Nothing contributes more effectually to create amicable but earnest emulation among the votaries of art than competition. It is true that this is very frequently a sharp spur which pricks us up somewhat painfully; but we get on the better for it, and reach our goal the sooner. The opportunity of making a comparative study of contemporaneous productions is of the utmost value to us all, and it is our duty to aid the organisers and managers of such institutions with our very best works.

The ardent cultivator of his art, working without competition, and consequently growing indolently complacent and comfortably self-satisfied, may grow somewhat peevish, snarlish, and impatient of his own progress when he sees the inferiority of his specimens made so painfully apparent by contrast with a Fenton's, a Rejlander's, a Williams's, or a Wilson's; but, if he be made of the right stuff, out of such feelings must arise that manly and noble spirit of perseverance and emulation which will bring about a stage of perfection and success he would not otherwise have aimed at attaining. This bringing together of works executed by the most successful operators in the country keeps us moving, and when you "halt" you must inevitably soon find yourself in the rear of your advancing comrades.

Impertinently supposing that you, my dear reader, were a very egotistical personage (which of course you are not), dearly loving to display, when occasion served, your various virtues and charms, I venture to say that from this fact would arise one of two things: either you would be treated with well-deserved contempt for advancing pretensions to qualities not in your possession, or what I have termed your egotism would be duly admired and venerated as the lofty self-respect and dignity of conscious genius. Now, instead of the egotistical personage with or without a proper foundation for your published pretensions, suppose yourself a society making similar claims, and permit me (addressing you as a society contemplating a photographic exhibition, and having a committee about to appoint a sub-committee for selecting and hanging the specimens) to remind you how important a task you have undertaken, and to hope that the proper classification hint may be taken, that inferior productions may be declined, superior works not only invited but actively sought after (many excellent works are lost to sight through the timidity or modesty of amateur operators*), and above all that its pictorial capabilities be prominently displayed, inasmuch as upon the latter must be founded its chief claim to public patronage.

Before quitting my subject, there remains another class of personages in connexion therewith to be noticed—viz., photographic art critics.

Although, among the writers upon photographic exhibitions, we have those who criticise ably enough the optical, chemical, mechanical, and manipulatory qualities of the works collected, I do not remember any two critiques in which photographs have been criticised as pictorial productions.

Art critics have, upon the whole, obstinately refused to recognise photographs as works of art, and have, sometimes with sweeping blows and hostile denunciations, and at others with sneering condescension and patronising charitableness, aimed at thrusting it into the ignoble class of mere mechanical processes, or treated it as a purely scientific pursuit. By these the efforts of our more aspiring and artistic operators have been frequently discouraged, the public estimation of the art more or less lowered, and the character of a successful photographer considerably depreciated. Having to war against these is another good and sufficient reason for endeavouring to elevate the intellectual character of exhibited productions.

Again, it seems to me, from a perusal of the critical remarks on these expositions, published in our photographic contemporaries year by year, that the opposing critics could have no more able assistants than the supporting critics. The latter's writings display such a lamentable ignorance of imitative art and of a picture's most elementary principles, and presume so evidently upon a superficial acquaintance with a few of the more common art techni-

* I hear many complaints from professional exhibitors with regard to the unwarrantably great damage done to their productions before their return, &c. One gentleman, whose word I can rely upon, informed me that he had lost a complete set of stereoscopes which were exhibited last year. Another, that his frames, of a costly character, were returned in an almost worthless state, and so on. Now, although professors may set the advantage gained against such losses, it is clear that amateurs cannot do so, and that the exhibition must from this cause alone lose some of the best pictures in the country. I know that some small damage to the goods of exhibitors can scarcely be avoided; but it is not common with other institutions to do so much damage, and I do not think it by any means impossible to avoid such altogether.

calities, or their high reputation in the scientific branches, that one can but grow angry and annoyed in perusing their grossly erring tissues of dogmatic ignorance or impertinent twaddle, and cry aloud "preserve me from my friends!"

The reason of all this is that we have given undue prominence to the mechanical and scientific branches of photography and neglected so thoroughly the artistic. The higher department needs cultivation before photography can assume its most prosperous and thriving condition, and the study of art should now blend with that of lenses, chemicals, apparatus, and processes.

We want our optician's labour to remedy serious defects still existing in our lenses; we want our chemist's wise head and noble knowledge to teach us how to translate nature's *chiaroscuro truthfully* and perfectly; and we want our ingenious mechanic's skill and experience for the apparatus upon the efficiency of which so much depends. But do we not want also that gifted intellect which creates not only a language common to every nation of the world, but a language which speaks in the music of beauty and the eloquence of poetry—humanising and elevating with tender and loving influence the heart and soul of man? When we have all these, how powerfully *then* will photography speak to the world through the rosy lips of our photographic exhibitions! That we *may* have this combination in one harmonious whole, heart, head, and hand must now be united in our work,—no more important branch of which exists than that I have now pointed out to our photographic societies, our photographic exhibitors, and photographic critics, in photographic exhibitions. J. Cameron tells us—

"Science for ever sees her limits fly:
A conquering power in transitory near,
The common world of common eye and ear.
Yet can *she* commune with the highest high?
Nay, she not seldom putteth out the eye
And chokes the ear that communes with divine.
She kneels not at the spirit's inmost shrine:
There is no Jacob's ladder in *her* sky!
Thine are the exalting functions, holy Art!
Thou cans't translate the soul to cloudless prime,
Bring down from realms that know nor time nor space
Pure apparitions that content the heart;
Thou fill'st the spirit with the peace sublime
Of who with God hold commune face to face."

ON THE WAXED-PAPER PROCESS.

By W. H. Leather.

[Read at a meeting of the Bradford Photographic Society, on Dec. 5th, 1860.]

As the Waxed-Paper may now be considered an old process, I wil will simply give in detail my present practice.

The paper I prefer is Marion's negative, which I believe is sized with some vegetable sizing; but English papers, which have animal sizing, have also been used. Any specimen of wax that is chemically clean will also do: I have hitherto used some prepared by myself from the honeycomb. Having ascertained which is the right side of the paper, I divide the sheet into four, and mark each quarter sheet with a pencil at one corner, on its right side. These quarter sheets give the size suitable for my camera, which takes pictures 10 by 8 in.; and I proceed to wax them in this manner:—I have a smooth half-inch deal board, 13 in. by 11 in., which I lay on the table; and on this I place a whole sheet of white filtering paper folded in four, which serves as a pad, on which I lay my sheet of paper to be waxed, right side upwards. I now take a common box smoothing-iron, moderately hot and perfectly clean, in my left hand, and go over the whole paper. I then take the wax in my right hand, and apply it to the side of the iron, which with my left hand I hold at the left top corner of the sheet, and only about half an inch on the sheet. As soon as sufficient wax has melted to form a wave, I chace it with the iron right across the paper, and commence again at the left hand lower corner, repeating the same. If any portions of the paper are still without wax, I bring the iron over them and apply the wax, going over the whole afterwards with the iron, to equalise the distribution of the wax. When all my sheets are gone through, I place another heater in the box-iron, rather hotter than the first, and I place each sheet separately within the middle fold of a fresh pad of blotting paper, and with considerable pressure well iron the pad and the sheet within, in order to take off all superabundant wax. The sheet should now present an even appearance, without any shining spots, and in this condition I store up my sheets, and iodise them afterwards as they are required for use.

Many iodising solutions have been recommended, all of which, I dare say, are good. I use the following:—

Iodide of potassium...15 grains		
Bromide.................... 5 "	to each oz. of water.	
Gum arabic................ 2 "		

I pour 12 oz. of this solution into a clean porcelain dish, 12 in. by 9 in., and immerse the sheets one by one, taking care that no air-bubbles intervene or attach themselves to the papers; and I let the whole remain at least an hour, occasionally moving and agitating the sheets. They are then taken out and pinned by one corner, to drain and dry. I prefer to iodise my sheets in a darkened room, though I believe this is not material. The only further attention I pay to them is to visit them in about a quarter of an hour, and touch the lower corner of each sheet with a piece of filtering paper, to remove the last drop of solution. When dry, they are ready for exciting, which is done by immersing each sheet separately in a bath composed of

Nitrate of silver......30 grains	To each ounce of
Glacial acetic acid, 30 minims	distilled water,

taking care that no air bubbles are allowed to remain, and occasionally agitating the dish containing the sheets. I prefer to excite only two sheets at a time; and after the second sheet has been four minutes in the bath, I take each sheet out and immerse it in a bath of clean common water, well agitating it for about a minute, so as to wash off the excess of the exciting bath. If I intend to expose the sheets the same day, this washing is sufficient; if more than one day intervene before exposure, it is necessary to wash again in a fresh bath of water as before. The sheets are removed from the water, drained for a moment, and each separately placed in a clean pad of filtering paper, to remove as much as possible of the moisture, and afterwards pinned up until the surface is apparently quite dry, when they may be placed in the exposing frame. The time of exposure varies from three quarters of an hour on a sunny winter's day, to ten minutes on a bright summer's day. The picture is developed by placing the exposed sheet in a bath of gallic acid for a few minutes, then, taking out the sheet, add a little of the nitrate bath to the gallic acid, and after well mixing these together, again immerse the sheet, when the picture gradually acquires the requisite detail and density. I find it is not necessary to use a saturated solution of gallic acid; but it is necessary to see that no crystals of gallic acid are allowed to get into the developing bath, as these are liable to cause stains. The developed picture is washed well in two changes of clean water, and I prefer fixing it in daylight, so that I can see when the yellow iodide is all dissolved out. The fixing bath is composed of hyposulphite of soda, six ounces to a pint of water, the whole of which I pour into a common salt glazed dish of sufficient dimensions, and immerse my sheets, removing them, as soon as the iodide is out, to a dish of clean water. They are then well washed in three or four changes of water (one hour to each change), then removed to drain, blotted off, and pinned up to dry. When the surface is dry they are exposed to a moderate warmth, so as to re-melt the wax; and this completes the process.

ON IODIDE OF SILVER.

By Dr. J. Schnauss.

(Concluded from page 300.)

I think I may be allowed to notice in this place a peculiar phenomenon, lately observed by several renowned photographers—viz., the blurring* of the blacks of the negative in a fixed direction. It cannot be produced at will. I, at least, have only noticed it three times. In the two first instances it happened that, on developing a portrait taken on a collodion strongly iodised with iodide of cadmium and some bromide of cadmium, by means of a solution of sulphate of iron, the deepest blacks—for instance, that of the hands, the collar, &c.—appeared blurred in a fixed direction, not sharply defined. The third time this phenomenon appeared with my usual collodion (iodised with ammonium and cadmium, but which also contains some bromides), the picture seemed almost over-exposed. The direction of the blurring was in all three cases the same—namely, that in which the silver flowed downwards in the slide, and (whether accidentally or not) that in which the developer was poured upon it.

In the two first instances I also ascertained the remarkable fact, that my collodion, iodised with cadmium salts, did not produce, as is usually the case, negatives of a reddish hue, very tender, and over-exposed in aspect; but, on the contrary, after a very short exposure, it produced sharp pictures of a deep-black hue and very intense. The pyroxyline had been prepared by myself at the heat of 55° (R), by means of nitre and English sulphuric acid; I had also produced the iodide and bromide of cadmium myself.

In a later experiment, in which the pyroxyline had been washed

* This appearance is known as "*halation*."—Ed.

with ammonia and then with distilled water, the phenomenon of blurring did not reappear, and the negatives were tender and of a reddish hue. May not this phenomenon of intensity have been produced by some acid in the pyroxyline, which evidently was also the cause of the blurring?

It is difficult to give any reason for the latter phenomenon. Until now, I believed it to result from pouring on too quickly a strong-acting developer. Other photographers, however, seem to trace its cause to the silver solution drawing down the plate during the exposure.

There are two important phenomena in connexion with iodide of silver which also partially indicate a modified condition of it. One — the least understood — is exhibited in what in England is termed "the reversed action of light." In France the images thus obtained are termed "amphi-positives."

The other phenomenon concerns the altered qualities of the + iodide of silver in a dry state, particularly in the inner part of the collodion film, as it occurs, for instance, in the "dry process."

Several photographers, among others Poitevin, De la Blanchère, and Schouwaloff, have lately taught us to produce this "reversed action of light" at pleasure. This action resides principally in the property of the + iodide of silver, imparted to it by, as yet, unknown causes of darkening under the action of the developer, even without having been exposed to the action of light, but not of so decided a black as that of ordinary negatives, but of a reddish brown, similar in hue to that assumed by negatives too strongly lighted in the first moment, under the influence of pyrogallic acid. But while the latter continue to attract the reduced silver, and are thus continually growing darker, the amphi-positive images appear to be deficient in this quality.

Working dry collodion plates has taught us that the dry photogenic film of + iodide of silver in connexion with the organic substance of the collodion, if not exactly less sensitive to the action of light, has far less power than the still *humid* + iodide of silver to assume the dark black tones required in a negative, even if from the latter, as in the dry process, all the surplus nitrate of silver has been washed off, and only put on again by immersion in the silver bath before the development. The cause of this consists in a different molecular arrangement of the film, as is evident in looking at a dry and a wet collodion plate. The wet film, after immersion in the nitrate bath, assumes a yellowish white colour, and is not transparent; whereas, the dry film, after being washed and dried, is nearly transparent. The first represents, as it were, the hydrated state, and the latter the anhydrous.

The collodion film, in consequence of its porosity, is very likely the principal cause of this phenomenon: still it is also possible that the + iodide of silver produced exists, at the same time, in a corresponding anhydrous or hydrated state. Chemistry, at any rate, teaches us that many solid bodies exist partly in the hydrated condition and partly in the anhydrous, and that the heavy oxides of metals must more easily form combinations in the former state than in the latter. For example, the yellow hydrated oxide of iron readily dissolves in dilute acids, while the red anhydrous oxide requires both stronger acids and the aid of heat. Therefore it is very natural that the whole process of developing takes place much quicker, and with more energy, in a wet plate than it does in a dry plate, since with the first there is an easier penetration of the film.

While the collodion film is drying on the glass plates a not inconsiderable contraction takes place, which may be readily observed in negatives on the edges of the glass plate, where the film will sometimes exhibit a perceptible shrinking to the extent of an eighth of an inch. This also explains the increased darkening in the negatives, after drying, in consequence of a contraction of the black silver molecules, which, as it occurs in every direction at the same time, results in a scarcely perceptible diminution; only if the cohesion of the film be lessened by adding too much water to the collodion, a very injurious cracking of the film takes place in the drying, whereby particularly the darks of the negative are riddled by an infinite number of small net-like cracks.

In the hydrated state the collodion film is much more easily penetrated by the liquids poured upon it. Therefore, in many photogenic processes of this kind—as, for instance, in the collodio-albumen process—there occurs not only a coating of the collodion film with albumen, but a more or less complete penetration of both substances.

On drying iodised collodion plates, which are coated with strongly iodised albumen, it is frequently observed that the whole film becomes perfectly transparent, the cause of which is, that the + iodide of silver is dissolved in the iodide salts (potassium, ammonium) of the albumen, and converted into — iodide of silver. When such plates are subsequently immersed in the second nitrate of silver bath, a decomposition of the — iodide salts takes place, and consequently an evaporation of the iodide of silver which has been dissolved; upon which the film again assumes its original opaline, almost untransparent, appearance.

In many "preservative processes," hygroscopic substances are employed with a view of preserving the hydrated condition of the photogenic film.

These agents certainly produce strong negatives generally much easier than can be obtained from a dried film. It will be interesting to pass in review all the various substances hitherto proposed as preservative agents for collodioned plates, as far as I can recollect them at present.

MINERAL SUBSTANCES EMPLOYED.

1. Nitrate of magnesia.
2. Nitrate of zinc.
3. Chloride of lime.

SUBSTANCES DERIVED FROM THE VEGETABLE KINGDOM.

1. Syrups (solutions of sugar of various kinds).
2. Wine (champagne).
3. Beer (brown stout).
4. Balsams, resins in great variety.
5. Glycerine (linseed).

SUBSTANCES DERIVED FROM THE ANIMAL KINGDOM.

1. Gelatine.
2. Metagelatine.
3. Albumen.
4. Honey.
5. Oxymel.
6. Milk.
7. Glycerine.

By the above list it will be seen that from the organic kingdom we are supplied with the principal ingredients of a frugal breakfast, as it may be composed of milk, eggs, beer, wine, and honey.

The series of preservative processes, all of which are but palpable modes of obtaining the same result by analagous means, has served one useful purpose—it has ministered to the vanity of a host of would-be inventors and discoverers; and from the readiness with which every crude idea finds its way into print, a temporary notoriety has been conferred upon the ingenious persons who have suggested them. Much ink might have been saved if the editor of some photographic journal had at first published a list of all known hygroscopic substances capable of being applied without injury to the collodion film. Any tyro in chemistry would have supplied him with as copious a list as we now possess, after the united efforts of some score of ingenious minds have, during the lapse of eight years, been devoted to the subject.

Of all the above-named substances, albumen and transparent gelatine command a preference over the others, which nearly all belong to *the sticky* series, or form a sticky coating on the plate, whereby they attract the dust and light particles of matter floating in the atmosphere, which exercise a very mischievous influence during the developing.

The only object of adding resin, or balsam, to collodion for the dry process, is to obviate the bad results arising from the contraction of the collodion as well as from the tearing and peeling off of the film.

STEREO-MANIPULATING CAMERA.

By Thomas S. Davis.

The special object of the Stereo-Manipulating Camera is to enable the tourist to produce stereographs by the wet collodion process without the encumbrance of heavy or inconvenient apparatus.

This invention essentially consists of a portable and commodious chamber and a light cone-shaped camera, having a rising front to carry the lenses. The chamber is capable of carrying the camera in its interior when packed, and has an aperture in front equal to the size of a stereoscopic plate, over which the cone slides when ready for use. Upon the internal side of this opening a frame is fixed, and a shutter is hinged to the back to enclose it in darkness. Immediately beneath the frame is a longitudinal stop, glazed with yellow glass, and fitted with slides in order to regulate the admission of light. Beneath this, and through the bottom of the box, a cloth bag is suspended to hold the nitrate of silver bath: over this a lid shuts for the purpose of excluding dust, light, or chance impurities. Upon the edges of the top and bottom of the box are hinged two

flaps, each half the height of the box: the upper one supports the black covering free from the hand, and the lower constitutes the table for the developing tray, and the two when closed protect the contents. The developing dish is made of tin, and holds over its centre a piece of wood, which retains the damp glass without slipping at a considerable inclination. By this simple arrangement the plate can be developed without fingering until it be thought necessary to examine it by the transmitted light, admitted immediately facing the operator. At the right hand side of the box there is an arrangement for holding three glasses to contain the developing fluid, water, and the fixing solution. The Stereo-Manipulating Camera is fastened in the usual manner to the top of the ordinary stand, and its elevation can be regulated to the height and convenience of the photographer. A curtain attached to the box answers the purpose of the focussing cloth, the completion of a light tight chamber when secured round the waist, and an outside wrapper to cover the whole when closed.

The apparatus is accompanied by a plate box, designed as a convenient arrangement for carrying wet plates without the risk of displacing the film. The boxes are made internally equal to the length of the plate, but about three eighths of an inch wider. Upon their longer sides four pieces of wood are to be attached a quarter of an inch distant from their ends: these pieces serve to retain a series of loose narrow slips, having raised corners, against the shorter sides of the box. By placing the wet plate face downwards upon a pair of these slips, it will be kept steadily in its place, and it will rest simply upon its four corners. Additional slips and plates can then be arranged alternately in like manner, and a number of pictures can thus be carried with complete security, and without the chance of the wet film becoming displaced by friction.

RESULT OF A SERIES OF EXPERIMENTS ON THE COLLODIO-ALBUMEN PROCESS,

As tending to show that the Structural Condition of the Albumen plays an important part in the Sensitiveness of the Plate.

By Dr. John Ryley.

[Read before the London Photographic Society, on Tuesday, December 4th, 1860.]

While making some experiments, in the spring of 1858, with a view of obtaining a dry collodion plate that would be more sensitive and uniform in its action, I was surprised to find the great difference between the sensitiveness of plates prepared with honey, gelatine, and gum, as compared with those prepared with albumen; for, while the three former are nearly alike in sensitiveness, the latter will not give results to them under six or seven times the exposure, and the greater the care bestowed in washing away all free nitrate before the albumen is applied, the more unsensitive the plate becomes; so that, contrary to all preconceived opinions, albumen (in my hands at least) has become a retarder, and not an accelerator, of the collodion film.

This effect I believed to be due to an altered structure of the albumen more than to chemical action. Coming to this conclusion, the thought struck me that if the plate, after being allowed to dry, was again immersed in the nitrate bath to coagulate the albumen, I should restore its sensitiveness; and so perfect was my success, that I took with a half-plate lens a negative portrait in thirty seconds, also one with a quarter-plate lens in fifteen seconds.

Having arrived at this point, another thought came across my mind, which was, that I might do away with the re-dip in the nitrate bath by using cadmium-collodion, as the free nitrate of that metal left in the film would be sufficient to coagulate the albumen. This I tried, and so far succeeded that I took a portrait of my son in about six seconds with a quarter-plate lens.

Being anxious to test my theory to the utmost, I determined to alter the structure of the albumen by the most simple means. Therefore, after taking my plate from the nitrate bath and washing away all free nitrate, and coating it with albumen, I plunged it into a bath of hot water (just below the boiling-point) for a few seconds; and so sensitive was the plate treated in this way, that I took a good negative with a stereoscopic-view lens and pen stop in less than thirty seconds. In conclusion, let me state that very good results may be obtained in the following way:—After washing the plate from all free nitrate and coating it with albumen, I wash off, as proposed by Mr. Fothergill, and then wash with a two-grain solution of gallic acid to alter the structure of the albumen; or you may use tannic acid instead, which is more sensitive, but more liable to solarise.

"GREAT EXPECTATIONS."

We have felt it impossible to resist a strong temptation to use the above title as a peg to hang a photographic chapter upon. This temptation is afforded by the fact that the great novelist has not been able—or at least has not thought fit—to get through the first column of his charmingly *naive* tale without alluding to photographers. We owe him thanks for that, though readers of this Journal would not need to have it so strongly introduced to their notice; for what is the whole narrative, as far as it has yet gone, but a photograph of the most positive description? The author has wonderfully developed the observations of the mental camera; and his images require but little fixing in our remembrance, for they are "familiar in our mouths as housenold words."

We say, what are the pictures of the villain convict, hardened in crime—the youthful Pip, brought up by hand, without so much as a sense of moral responsibility to prevent his following the commands of his terrible acquaintance—of the connubial pair so strangely mated, and leading such independent, yet dependent, lives—of the parish clerk who wants the church throwing open—of Uncle Pumblechook—what is all this but a stereograph, so to speak, of the best quality, to say nothing of the scenery,—the busy forge, the neglected churchyard, the distant dismal marshes, with the stakes keeping the tide out, visible with the gibbet against the horizon, the well-stocked pantry, and the characteristic Christmas dinner?

We have "great expectations" indeed of more positives by the same author. But his reference to photography carries us back to the pre-photographic period—the age before iodine became acquainted with silver; when short cotton crops affected the Liverpool brokers, but not the portraitist as yet ignorant of collodion; when lens-makers thought of achromatism it is true, but wot little of actinism; when there was no photographic past for Mr. Griffiths to croak at. (From his name we should have imagined a more sanguine man with "*great expectations*" of the future.) This was the ante-railroad epoch, when also the phosphorous bottle yielded both light and fire like its brother the tinder box, which was not yet honoured with a place in the Ashmolean Museum, where one may now be seen, with other marvels of the nineteenth century; when the policeman's bull's-eye had not yet superseded the lanthorn of Dogberry, soon to "pale its ineffectual fire" before the brilliant gas of the present day. But there was even then a dawn of "great expectations." Bichromate of potash and some other things had already shown symptoms of usefulness, though light, latent and bottled, had not yet even visited our dreams.

We are, however, forgetting Mr. Griffiths (would we could do so altogether); but we think, with Mr. Hardwich, that such disencouraging arguments as he offers should be condemned. It is perhaps scarce worth our while recurring to this subject, but the Chorlton Society seem inclined to keep it before us. Looking at this question, as a bystander on a passing game, it strikes us we get a good view of the whole matter. There is more implied in the title of Mr. Griffiths's paper than he is able to maintain. He professes to deplore our present ignorance, but does nothing to dispel the darkness which he seems to feel himself. What does he mean by saying that "even now, though ten years have elapsed since Mr. Archer's discovery, its effects are becoming known?" Does he want them to stop? If words mean anything, it is that its effects are beginning to be known, which it would puzzle a first wrangler to prove, and which we utterly deny. Perhaps he means its effects are becoming increasingly known, which is just what every lover of the art has most at heart.

Again, he says portraiture was the first practical use of photography. Perhaps so (do not let us forget the origin of portraiture represented by the Infant Cupid limning the shadow of his mother on the wall); but when he adds that landscape photography is next in order of usefulness, he of course infers that portraiture is still the *first* advantage of the art—which is very like saying omnibuses are more useful than railways, and cabs than either, because there are more of them. We think the verdict of our readers will be, "not proven."

But we do not want to rewrite Mr. Griffiths's paper, or one paragraph after another might be treated thus. We cannot fancy even Mr. Griffiths saying to any son of his—"it is of no possible utility your pursuing this or that branch of science; you will know no more in ten years hence than now:" and yet that is what his argument amounts to in our opinion.

Philosophers do not even yet know really and positively what electricity is, and see how long they have been at that. There are sceptics yet who think gravitation is not yet settled; and behold!

how fiercely the origin of species is now contested! The philosopher's stone and perpetual motion are impossible things, but some great results have attended their pursuit. And surely a man must not be deterred from the study of mechanics or chemistry because they are, and likely to continue to be, among "things not generally known."

Mr. Wardley thinks if Mr. Griffiths had said nothing about collodion Mr. Hardwich's "Comments" would not have appeared; so neither would Mr. Griffiths's very unwise remarks, for he refers to nothing else. We do not see any ground of complaint against Mr. Hardwich, who has entered upon the discussion with that gentlemanly feeling which is always the character of his "Comments."

Photography has had an immense influence in the world. Young in years, it is a very Infant Hercules in strength. We have shown, and may show further some day, how literature seems to have found a mine of wealth in it; nay, we think it might be shown that dress, fashion, manners, have come under its power. It has opened to us a vast new field of chemical inquiry; it has stimulated and originated a large amount of mechanical skill; it has brought together men of science of all grades; it has created a brotherhood, so to speak, of art and science combined; and not the least of its benefits is the pounds-shillings-and-pence side of the question. But it never would have done this—its place would only have been an aching void—had Mr. Griffiths's arguments obtained at the beginning. There is no fear of their doing so now; and in place of using them himself in future, let us hope that he will be able to realise a few "great expectations" which will not be so gloomy as his retrospect of the past, which seems to be drawn from the "night side" of the question.

ON THE PISTOLGRAPH.

By Thomas Skaife.

[Read at the North London Photographic Association, on Wednesday, Nov. 28, 1860.]

I have been asked, over and over again, why I call a certain little photographic instrument a "pistolgraph?" And over and over again I have replied by saying:—Because the little instrument, when first invented, was in size and shape not unlike a pistol—was held in the hand, and manipulated by means of a trigger, like a pistol: one being constructed to take life, the other likenesses.

The pistol camera, constructed to take pictures on concave glasses, was first introduced to the public about two years ago; but, on being modified to take pictures on flat glasses, it took the name of pistolgraph—the termination "camera" being exchanged for "graph."

Camera, though very euphonious in photography, is at best but a *pis aller*, as the French would say. Camera, in the original Italian, signifies a room, parlour, or bedchamber. A photographic camera is understood as the instrument by which photographs are taken.

But with more propriety, from a linguist's point of view, this name should be given to the photographer's dark operating-room. In this respect the French are not much in advance of ourselves, for they call their camera a *photographic "chambre noir."*

Telegraphy, in its terms, is much in advance of its sister science, *Photography*. The close relationship between light and electricity suggest a relationship in their several terms. The electric telegraph is the quickest instrument known for the conveyance of messages. The photo-pistolgraph is believed to be the quickest practical instrument known for taking children's portraits. By common consent a telegraphic message is now called a telegram. Why may not, with equal propriety, a picture thus obtained (a light engraving, if you please, in black and white) be called a pistolgram?

Life is short, but art is long. The craving for new ideas is inexhaustible; but eyes will wear out.

Commercially speaking, short, terse words pay better than long, euphonious phrases. In print the latter cost sixpence more—a sordid consideration, truly; but still it has its weight with those who work for bread as well as fame.

STEREOGRAPHS.

Chester and North Wales Illustrated, by Francis Bedford.

(Chester: Catherall and Prichard, Eastgate Row.)

There is, perhaps, no more perfect specimen of a walled city now extant in this country than the ancient city of Chester; and there are few persons who have any pleasure in contemplating the records of a by-gone age but must experience a thrill of pleasure on wandering for the first time surrounded by the numerous tokens which it contains of the former existence of customs and habits long since passed away. The wall, which, in ancient times, was erected for the defence of the city, entirely surrounds it, and is still in a state of very good, if not perfect, preservation. It is about two miles in circumference, and is sufficiently broad to admit of two or three persons walking abreast on the top of it. At the present day its chief use is to form a promenade; and a very pleasant one it is, affording agreeable prospects of the surrounding country, including the famous race-course and the river Dee, on the banks of which it is situated. When we say the wall surrounds the city entirely, we do not mean to assert that there are no extramural dwellings. On the contrary, there are many of them; but these are chiefly of modern date, the oldest of them bearing no comparison in age to those within the walls, though perhaps none of the edifices now standing were so as far back as the time at which we have records of the existence of the city itself, which date as early as A.D. 607.

The most striking features of all to a stranger are, however, the "rows," or terraces, evidently designed with a view to affording additional shop accommodation in a contracted space, necessarily limited when the walls served their original purpose of defence. In the streets where these rows are found the front rooms of the storeys immediately above the ground floors of the houses are absent, the back rooms being, as a rule, converted into shops, and the third stories project overhead as far as the basement storeys; so that a sort of covered terrace pathway is formed over the tops of the shops which stand in the ordinary level of the streets. To these terraces access is obtained by means of flights of steps at irregular intervals from the main thoroughfares; and, as the houses were originally built in the most independent fashion—scarcely any two contiguous ones being of the same height or style as regards any of the several storeys—the effect produced is highly picturesque, if not convenient. But for the narrowness of the streets, Chester would be a photographer's paradise in affording subjects. As it is, however, there is rather too much of the cup of Tantalus as an unavoidable ingredient to allow of unmixed gratification.

Amongst the series now before us, No. 61, Bishop Lloyd's House in Watergate Street, gives an excellent idea of the appearance presented by some of the more ancient edifices which we have been endeavouring to describe, and in which slide one of the flights of steps leading to the rows is discernible, as also the variation in the level of the adjoining houses. The quaint old carving on the wood-work forming the entablature, and on the front of the topmost storey, under the high-pitched gables, is of itself a complete study, and would, for this feature alone, render this slide valuable.

No. 38, Eastgate Street, containing a view of the publishers' establishment, illustrates the method in which the characteristic arrangement of the rows has been retained, even with the modern erections, which are almost exclusively to be seen now in this street.

No. 45, Watergate Row (South), must have been a very trying subject for the camera, in consequence of the marked absence of light—indeed, more trying than many interiors. Here the spectator is located on the footway of the row itself, and looking along it. The ups and downs of the pavement are readily perceived, arising from the varying heights of the shops below; and the low ceiling formed by the floors above recal vividly to the memory the strange impressions produced on first beholding the place itself.

Amongst the illustrations of North Wales, some Cottages at Aberglaslyn, Beddgelert, No. 188, form the subject of one of the most excellent slides of the series. With low thatched roofs, and windows "pitched" in anywhere, built in a hollow at the base of a towering hill of slate rock, and backed by a clump of trees, which are seen through a partial veil of transparent smoke issuing from the cottage chimneys, while the road winds in a graceful curve towards the left hand, fenced off by low walls of loose stones, these cottages, which are ostensibly the subject of the picture, really form but an insignificant element therein. In the foreground, a fine fir tree stands out boldly; and on the extreme right the windings of the valley, backed by many distant hills, are rendered with a truth of atmospheric effect that is highly to be esteemed. This is in our estimation one of the gems of the series, whether as regards composition (if we may apply this term to happiness of selection) or execution. It is in every way satisfactory.

Stone Depot at Penmaenmawr does not sound very attractive as a title; but the slide, to which it is applied is an exceedingly good one as a photograph, and by no means unpicturesque. The gentle curve of the bay on the left, repeated by that of the railway

just clear of the beach, together contrast admirably with the rugged outlines of the rocky mountains in the far and middle distance; while on the right hand is a precipitous slope, down which huge masses of stone from the depôt above have rolled in admired disorder, while numerous cottages seem to be disposed in various parts of the view *much upon the same plan.*

For breadth of effect, No. 118, LLANBERIS PASS, *from Pont-y-Cromlech,* can scarcely be surpassed. As a study of light and shade, it is truly magnificent. The somewhat insignificant stream in the centre, which reflects an intensely white glare from the unveiled sky, *stumbles,* as it were, amongst the huge boulders which have rolled from the massive ranges of rocky hills on either hand, which form the far-stretching valley:—those on the right o'ershadowed by a frown; while the distant parts of the opposite range smile with a reflected gleam of sunshine, melting into shadow with the most delicate gradation of half-tone, as the eye is turned towards the nearer portions of the valley. In this slide there is next to nothing of "incident." The whole value consists in the *chiaroscuro;* but then what a value it is!

No. 150, BETTWS-Y-COED, *Pont-y-Pair,* from below Bridge, is about as complete a contrast to the preceding as could well be conceived. In this, hill and rock and the very stream itself are almost smothered in a wealth of verdure. In that, all is stern severity—perfect in its very sterness, it is true: in this, there is a lavish indulgence in graceful foliage. In the foreground a huge mass of rugged and grotesquely-formed rock juts, promontory-wise, out into the stream, and upon which, in a naturally-formed hollow, sits a youth. In the middle, the stream, dashing from side to side in a zig-zag direction, courses along in the deeply-worn rock channel, and across which a bridge is thrown; but so densely is this bridge covered with the luxuriant ivy, that little more than its outline is suggested, not seen, while behind it the graceful feathery tops of a clump of fir trees are themselves backed by high hills, with fir-crowned summits and wooded base. On either side the stream numerous forest trees revel in wild luxuriance—the ash, sycamore, and holly being plainly discernible. Beautiful as this slide is, the effect is a little marred by a trifle of over-development of the negative. The same observation applies also to one or two others; and, though it may savour of hyper-criticism to point it out, we have no fear of being misunderstood by the clever artist who produced these charming pictures, whose aim is always to advance still further towards perfection. Mr. Bedford's larger works are too well known to need commendation from us. We have on many occasions before the present expressed our deep admiration of his style—artistic, neat, compact, clear, and brilliant; but it is in all probability the latter quality—excellent in larger single pictures—that, in a trifling degree, takes from the effect of a few of his stereographs: for it may be regarded as a very general rule that even dull and heavy-looking stereographs, when viewed in the instrument for which they are designed, not unfrequently surpass in beauty the more brilliant and striking specimens when viewed without its aid. And the reason why this is so is not difficult to discover on consideration of the subject; because the single eye, which of itself does not readily appreciate distance, requires the aid of high lights and deep shadows in an *exaggerated degree* in order to arrest the attention at particular prominent features in the subject. But when both eyes of the spectator are employed to view a single picture, the fact of its being delineated upon a plane surface becomes unmistakeably evident, and the artistic exaggeration of the high lights becomes doubly a necessity in order to give effect to the subject; but when each eye has presented to it its own proper picture, then there is no need to indicate by extraneous artifice the prominent features. It is for this reason that we constantly recommend the use of an iron developer for stereographic negatives; because there is less danger of exaggerating the effects of light and shade: a softer negative is generally produced than when an organic developer is employed, more especially when the exposure has been a trifle too short; and this does not preclude the possibility of after-intensification with pyrogallic acid, if found desirable.

No person who is making a collection from this series should omit including A GROUP OF WELSH PEASANTS, eminently characteristic as it is of the costume and general appearance of the poorer class of Welsh women. An old woman is seated in a chair at the cottage door, knitting; a younger one is just starting on some errand, with milk-can on her left arm, and poising a huge brown pitcher on her head; while another, dressed in the broad-brimmed beaver hat and singularly ugly full-frilled muslin cap, with boat-shaped market-basket on her arm, appears to be conversing with her. The middle figure of the group is evidently constrained; but the other two are posed easily and naturally, and the verity of the nationality is unquestionable.

We have marked many more of this admirable series for comment; but we have already extended the present notice to so great a length that we must defer till a future time further mention of them. We propose, however, returning to them in due course.

NOTES OF A PHOTOGRAPHIC YACHT VOYAGE IN THE MEDITERRANEAN.

By W. J. C. MOENS.

(*Continued from page* 351.)

WE sailed for Malaga on the 14th November, arrived at seven the next morning, and immediately made preparations to go up to Grenada in order to pay a visit to the Alhambra. We got leave to pass our photographic apparatus through the Custom-house, which we did in the morning, and left our portmanteaus on board till it was time for the diligence to start; but, to our great disgust, when we landed in the evening we found it was too late for the Douane. We made a frightful disturbance, but it was of no avail; so we returned on board, tied up some few necessaries in a pocket handkerchief, and, putting a box with a dozen 9 by 7 glasses (which are highly contraband) in my pocket, landed again, leaving our portmanteaus to come up the next day. We started at nine in an old-fashioned diligence drawn by twelve mules, two and two, with a number of bells on the collars of each, the jingle of which during the whole journey was deafening. At half-past one Malaga was still in sight, we having been ascending slowly, but steadily, for four hours and a half. We arrived at Grenada at half-past two on the 17th, after a most lovely ride through magnificent mountain scenery.

As soon as possible we presented a letter of introduction that Mr. Mark, our Consul at Malaga, had kindly given us to Mr. Contreras, who is engaged in restoring the Alhambra. He gave us the use of one of his rooms, and got us permission from the Governor to do what we liked in the picture way. We feasted our eyes on the glories of the ancient possessors of Grenada, and then returned to a less etherial but equally satisfactory repast at the Victoria Hotel. The next morning we got a guide and packed our *impedimenta* on a mule, with whose owner we had a most violent altercation in the street, opposite to the hotel, with a crowd of spectators round us, as to the possibility of putting our things the right way on the mule's back; he always persisting in slinging everything upside down, particularly my friend's nitrate bath, which was in a case by itself. At last it was packed all right, and everything was landed in safety in the Alhambra, which is on the top of a hill, with the river Darro running at its base. After having another look at the beauties of the place, we ascended and took a panoramic view from the top of the tower of the Vela. It was so late in the afternoon before we began to photograph that the third picture of the series proved a failure from the rapid diminution of light, which here takes place much more rapidly than in our northern climes. We spent a week at this charming place, taking several views, both interiors and landscapes, the exposure varying from twenty seconds with my large, to ten minutes with my stereoscopic, lenses. One cloudy morning bothered me frightfully: I spoilt two plates before getting a satisfactory picture. The light was so very actinic, I could not account for it in any way.

We made friends with some compatriots here. The ladies of the party were sketching and painting; and they greatly envied us our facility of knocking off pictures in as many minutes as it took them hours, particularly that of the Court of Lions—the perspective of the columns and fretwork of the courts driving them to distraction.

We returned to Malaga in the *corrieo,* or light mail cart, and on arriving at midnight were deposited at the post-office, with all our luggage, which the officials would neither take to the harbour (except at an exorbitant charge) or allow to be left in the office. About twenty ruffians were yelling at us in an unintelligible lingo: the only thing we could make out being that whatever we wished done was impossible. So we thought the best thing under the circumstances was to sit down on our luggage and go to sleep, for we were very tired after a long ride of seventy miles. This staggered them; and after a few minutes an official came out of the interior office, and told us that we could leave them till the morning, which was all we wanted. The next day I tried a view of Malaga, but found that the shaking during the journey had deranged my bath—pin-holes and small spots appearing all over the plate. I was using Ponting's collodion, which seems to make the bath very acid after using it for some time, but a little acetate of soda always brought it right again. At Malaga we met Mr. M——, a brother photographer: he was stopping there, for the benefit of his health, during the winter months. He had been using some of Hill Norris's dry plates: some had turned out very well, but he found them rather uncertain. He was much pleased with the new (to him) method of printing with alkaline chloride of gold.

On the evening of the 25th November we sailed for Algiers, which we reached on the 29th, after a long passage on account of the light winds. The town is situated on the east side of Cape Caxine, on a hill so steep that from nearly every house the sea can be viewed. The houses are all white-washed outside, so that from a little distance the town looks like a chalk cliff: the streets in the Moorish part are very narrow, but the French have

built a wide street and a very fine square. On landing, a strange scene presented itself to our European eyes—Negroes, Moors, Arabs, and all those indescribable beings you only see in an Eastern city, wearing garments of every colour and cut. The native women looked more like ghosts than anything else, being clothed entirely in white; their faces covered, and wearing large loose trousers in lieu of petticoats. We called on our consul, Mr. Bell, who lives in a street six feet wide, in a very nice Moorish house, which, though only bare whitewashed walls outside, within is a little alhambra, with fountain in the centre court, all the arches of the horse-shoe shape peculiar to the Moors, and the ceilings of the splendid lace work they are so famous for. On the 7th December, the day before leaving Algiers, we got permission from the authorities to photograph, which is quite necessary to obtain in a foreign country; for without it you are sure to get into trouble, and run the risk of getting your apparatus damaged by some little petty official. We took a panoramic view of the town and pier from the battery at its extremity. On the pier are a number of blocks of concrete, about 10 feet square, which are built up, and, when hardened, are upset into the sea to strengthen the breakwater. The exposure here was very short, about seven seconds for our 9 × 7 pictures, and almost instantaneous for stereoscopics.

On the morning of the 10th of December we entered the bay of Boujeiah, which is situated between Cape Carbon on the west and Cape Cavalo on the east. This bay is one of the safest in Algeria, being only open to about three points, and will prove a most important naval station to the French in the event of a war with this country.

Boujeiah was the prettiest town we saw in Algeria—Beni Tchondju (4730 feet high) and Babor (7087 feet high), rising close behind it. On one of these is an ancient Saracenic castle: the highest peaks of the North Atlas range stretch away eastward. The rocks of Cape Carbon are magnificent, rising perpendicularly from the water, of a deep red colour, from the quantity of iron ore contained in them. Boujeiah was founded by the Carthagenians under the name of Saldœ: a number of ruins a little way from the town show the site of the ancient city. The old walls still exist: part of them, between the Castle Abd-el-Kader and the Saracenic Gate, were overthrown by an earthquake in 1857. The town is still supplied with water by the ancient aqueduct. We landed early in the morning with the photographic apparatus, the Douane authorities having told us that we might do what we liked: so we sent up our cards to the Commandant, who had gone out shooting, and commenced taking pictures—two gendarmes, in rather an excited state, watching us in order to prevent our taking the fortifications. My friend went up to see the mayor, who wanted to know what we were doing.

I had just finished when two officers and some soldiers came up, ordered us to rub out all our pictures, and told us that we, with our men who were helping us, and our apparatus, were all to go up to the bureau of the Commandant. Here we found the second in command in a very savage state, insisting on all the pictures being rubbed out immediately; and that we were not to be allowed to go on board till the Commandant returned, which might be in a day or two. We remonstrated, and refused to destroy the pictures till his superior had seen them, and got leave for the two sailors we had with us to go on board; but we had to remain. So we amused ourselves by taking a walk, and looking for the fortifications that they seemed so jealous about. Besides the old castles that had guns on them, we found several new earthwork batteries, to mount heavy guns, thrown up a little to the north of Fort Abd-el-Kader, having a complete command of the bay. This struck us as being very significant of the intentions of the French Emperor; for the English is the only power likely to be of any danger to him on his sea-board, particularly on the coast of Algeria. We continued our walk to the lighthouse, and on returning were met by an officer who told us that the Commandant had come back, and that we were at liberty to do what we liked; so we revisited the bureau and found our former persecutors turned into friends. They gave us oranges and brandy and water, and went on board the yacht with us; and now they wished to detain us as visitors, offering to get up hunting parties, lend us horses, and do what *we* wanted. But our dignity had been touched, so at four o'clock we set sail for Cagliari, and when we turned in for the night were doing ten knots. I forgot to mention the great variation of actinism at Boujeiah—in a quarter of an hour the exposure altering from twenty seconds to two minutes, and this in cloudy weather.

(To be continued.)

HOW TO VARNISH THE NEGATIVE.

By R. W. Thomas.

[Read at a Meeting of the London Photographic Society, December 4, 1860.]

This subject is deserving of careful attention, at the same time all that can or need be said concerning it may be stated very plainly and in a few words.

I will endeavour to explain and comment upon the two methods now in use, and will distinguish them by the terms "hot" and "cold." I apply the first term hot to the process making the warming of the plate necessary, previous to pouring on the varnish, which is applied whilst the plate is still warm. This method is very generally followed, notwithstanding the inconvenience of heating the plate; for the reason, that the coating left upon the surface is perhaps harder than when cold varnish is applied, and consequently stands a greater amount of rough treatment—no doubt a desideratum. Ordinary spirit varnish, whether French or English, contains a certain amount of water; that is to say, the spirit generally used is not absolute. A more fluid, and consequently a better, varnish can, I think, be made with absolute alcohol — at least, such is the result of my experiments; but, whatever strength of spirit is used, the effect of all spirit varnishes, more or less, is to interpose between the image on the surface of the negative and the prepared surface of the paper a layer of gum more or less thick. I need hardly say that any intermediate film must prevent absolute contact of these surfaces, and consequently detract somewhat from the sharpness of the picture.

There can be no very great mystery as to the composition of spirit varnishes when it is considered that the gums we have to select from are not numerous; viz., copal, animi, sandarac, thus mastic, lac, and dammar: these gum resins have however various properties, some being harder and more vitreous than the others, whilst some are sticky and resinous. It is therefore very desirable to make use of both these qualities by selecting and combining judiciously such of the gums just enumerated as shall give a varnish possessing hardness and durability, with sufficient elasticity. The hardest gum cannot be used alone, but must be mixed with one more resinous, in order to provide against the possibility of cracking or splitting up of the surface left on the plate. I find that a mixture of the three first on my list answers the conditions just laid down, if absolute alcohol with a small per centage of chloroform is used for the solvent. This varnish has proved, in my hands, the best of the spirit varnishes. I have heard it remarked that this, and no doubt other strong spirit varnishes, occasionally have a very unhappy property of removing the image from the negative; I must say, that I have never been able to produce this undesirable result myself, and I think perhaps that such an action may have been due either to moisture in the film, unequal application of heat to the plate, imperfect washing out of the hyposulphite of soda or cyanide, or to some peculiar rottenness or condition of the film of collodion. The advantage and disadvantages in the use of spirit varnish may be briefly stated: in its favour, a greater hardness of coating; against it, the inconvenience of having to heat the plate, and loss of sharpness in the positive from the interposed film of gums left upon the surface of the negative. Having disposed of what I have termed the hot process, it only remains to draw attention to that designated "cold." It is not my intention to enumerate the various solvents and gums which are or might be used for the manufacture of cold varnishes. I have tried many of them, and find that all are, more or less, tacky when dry.

I shall confine myself to a few words descriptive of the best cold varnish, which, unquestionably, is that made by dissolving amber in chloroform. Many will be surprised to hear that such a thing as a package of fine amber seldom if ever finds its way to this country; but plenty of a very inferior and rough description is to be met with. The finest kind is used for making the mouthpieces of pipes, which are, I am given to understand, of foreign manufacture. Having learnt this much, I set to work to obtain, through my drug merchants, some further information on the subject, and was fortunate enough to find out the holder of a large quantity of the chippings from the fine pieces of amber, which he had been provident enough to store away. This is not a coarse powder of amber, but unmistakeable chippings, cut as with a sharp instrument, bright and clear in quality, in every respect equal for making varnish to the fine and most costly pieces, of which, indeed, these chippings are a portion. With such a sample as this there is no difficulty in producing a varnish in every respect desirable for photographic use, and sufficiently hard to withstand any friction the surface of a negative is likely to meet with. The coating left upon the negative is perfect, and can be hardly distinguished from the patent plate: this varnish penetrates the film, and adds very much to the beauty and clearness of the negative, at the same time leaving upon the film the thinnest possible coating, thus admitting of the most perfect contact with the excited paper.

I have had opportunities of examining some hundreds of negatives, produced by various operators, both amateur and professional, many of which were more or less disfigured, if not damaged, by the varnishing operation. My method of using the amber varnish is as follows:—I invariably make use of a little distilled water, with which I wash finally the finished negative; this removes the salts of lime that exist, more or less, with other impurities, in all waters, in quantities quite sufficient to prevent the formation of a brilliant surface. (I consider this simple, but cleanly, operation one of the important photographic "insect cares.") Now set the negative up to drain and dry spontaneously, face to the wall, and its lower part resting upon a slip of clean bibulous paper. It is as well to change this slip of paper once or twice. When surface dry, the negatives may be put into a grooved box to keep them from dust; and, if more convenient, they may be varnished next day. All varnishes should be applied in a dry room.* Attach the back of the negative to a pneumatic holder kept for the purpose, and having poured into a glass measure more of the varnish than is required to cover the plate, proceed to pour on as much as the plate will hold; keep the plate as horizontal as possible, and let the varnish soak well in for twenty or thirty seconds; then gently raise the plate and pour back

* Just before varnishing, pass the back of the plate over the flame of a lamp, to drive off any moisture: allow the plate to cool before pouring on the varnish.

into the measure the excess from the nearest right-hand corner. The varnish must not be dashed off, but the plate very gently elevated, at first only just out of the horizontal, and very gradually raised until it stands vertically on the edge of the measure; in this position let it remain a few seconds; on no account rock or give it any eccentric motion, and during the whole operation hold the breath, or turn the head away from the plate to breathe.

Always have two bottles for varnishing, the one to contain the stock of bright filtered varnish; the other to receive the portion poured back into the measure from the plate: when sufficient has been collected in this bottle, filter it through paper into the bright stock bottle. Amber varnish filters most rapidly and with a very slight loss. The measure used should not be washed out, but kept turned down and free from dust; it is then always ready for the purpose required.

I possess a negative portrait of Sir John Herschel, taken about six years ago, that I value very much. This plate was varnished with some varnish made of very fine amber: it does not show the slightest sign of decay—is indeed harder than when first varnished. I have also negatives kept under various circumstances of damp and heat for eight years, and still perfect. I am not alone in expressing a strong opinion in favour of amber varnish: both my own experience and that of many photographers enable me to recommend it in preference to any other; and I think the thanks of photographers are due to Dr. Diamond, who I believe some years ago first introduced it to notice,

Letters to a Photographic Friend.

No. X.

MY DEAR FRANK,

I NOW resume the record of my last day's photographic "experiences" in the Modern Babylon, which I was obliged to break off abruptly in my last letter.

From M. Bourquin's away I posted to Horne and Thornthwaite's, to overhaul a piece of apparatus that, though not an ordinary article of trade, Mr. Ackland kindly gave me the opportunity of examining in their portrait operating-room, and likewise favoured me with photographs of the apparatus figured below. This instrument is arranged for adjusting pictures, prints, &c., that have to be copied by photographic agency, to the propor position on the plate, or to the focus of orthographic lenses, &c. In *fig.* 1 we have a representation of the front view of the instrument. You will perceive that it consists of a series of sliding-frames, so as to permit the picture, &c., being adjusted to the desired heights, the horizontal adjustment being effected by pushing the apparatus in a lateral direction. By consulting *fig.* 1 you will see that a handle is fixed on a central pinion, which acts on a mill-head, shown in *fig.* 2: on rotating this, the frame carrying the picture, &c., works upwards or downwards. By shifting the key-handle to the pinion to the left hand in *fig.* 1, it acts on the mill-head attached to the right hand rod in *fig.* 2, and this brings into play an adjustment that allows of the picture being inclined towards the camera, which you will better understand by consulting *fig.* 3. By rotating the right hand rod in *fig.* 2 the screw in its upper part acts upon a piece of frame-work, A, so that it is forced upwards. As an inner frame, B, is hinged to this, and is also hinged to C, a frame that carries the picture clamps, and which is hinged at the point D, *fig.* 1, is forced forward, and with it the picture carried by this frame. Thus an upward or downward, a forward or backward, or a lateral motion, is placed at the disposal of the operator. As this is an eminently useful piece of apparatus in these "copying" days, I have thought it advisable to draw your attention to it, for I see no reason why this should not be a marketable article.

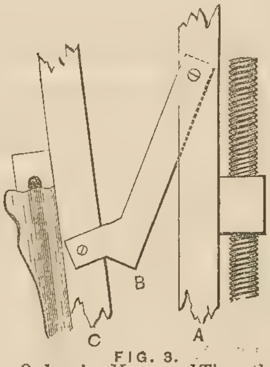


FIG. 3.

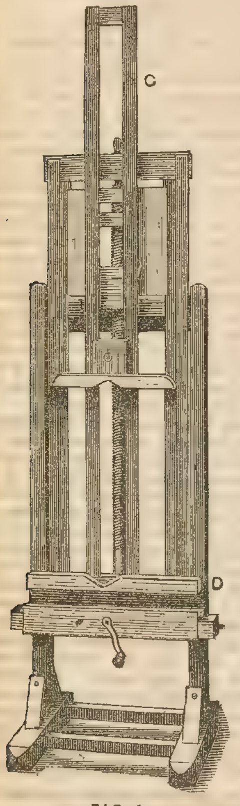


FIG. 1

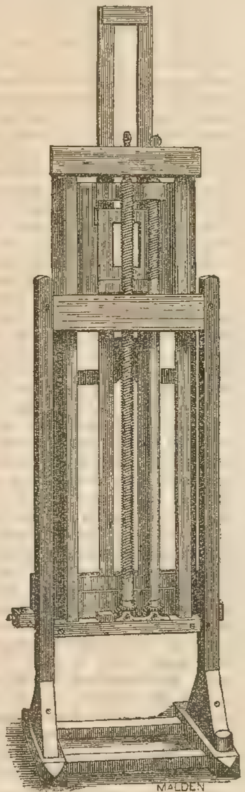


FIG. 2.

On leaving Horne and Thornthwaite's I made my way to Meagher's, in Coppice Row, Clerkenwell; and here I had an opportunity of examining the form of camera that I reported to you in my last as "shaky." Having had his attention drawn to the weak point of the arrangement, Mr. Meagher has so modified the construction that his camera is now as rigid as any of the same type that I described to you as adopted by several makers;—at the same time combining with this form a swing-back motion. The dimensions of the camera examined were 13½ by 11½, and three inches thick when packed, and when extended gave a range of 22 inches for focussing. I also had brought under my notice a twin lens camera, *fig.* 4, with "the iron roller-like shutter" of arrangement I have previously described, combined with the plan of fitting the focussing-glass so that it recedes behind the plate frame; thus the ground glass need never be removed from the camera. As, however, the glass is exposed when travelling, it is in this case guarded by a flap-door, hinged at the back of the camera. When one wishes to focus, this flap is lifted up, two side pieces attached to this door turn down, and thus a dark screen is formed to shade the ground glass during the operation of focussing; this is indicated in the back part of the drawing. Mr. Meagher states that both the roller blind and the receding focussing-glass came under his notice, about two years ago, in an American camera he had to repair. So, indeed, "there is nothing new under the sun."

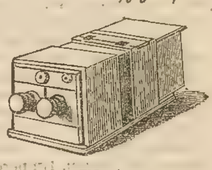


FIG. 4.

I have now to answer a few queries that you put to me respecting colours and artists' materials; but, as I have no experience in the practical details of photographic colouring, I have met your wishes by consulting our very good friend, Mr Wall. First, you ask me—What are the best colours for tinting glass positives?—and he tells me, from his own experience, those of Newman, Mansion, and Reeves. For oil and water-colour, Newman.—Next you ask, Where can I obtain the best brushes?—and our friend says at Clifford's, Piccadilly; Barbes', Regent Street; Newman's, Soho Square; and Miller's, Long Acre. But there *are* others of whom report speaks well:—Miller's "Silica Medium" our friend thinks "the best out," for oil, being colourless, and *remaining so*, to a much greater extent than any other in the market, and it also enables the colourist to use his pigments in a more transparent condition, without the excess of medium acting injuriously upon the colours, or destroying their purity.

And now, my dear Frank, in bringing to a close my engagement with you (to tell you of all that came under my notice in the London photographic market, and give you my candid opinion on

all I saw), I have endeavoured to the best of my judgment to do justice to all things and persons, and that in a way totally unbiassed by any motives that can in any way be called interested, or notions that can be classed among the preconceived. As my review was voluntary and unsolicited, I have not, in my letters to you, noticed those things put before the public that for one reason or another I have not thought worthy of their attention; but I may say that I have met with inventions, good *in principle*, but carried out in such an ultra economical manner, that they have counteracted the good *idea* by the inferiority of their workmanship. And here I would protest against the fatal economy of those who seek after things TOO CHEAP; for it should never be forgotten that "every labourer is worthy of his hire," and that the *very* cheap article is not always *cheap in the long run.*

I must now conclude these communications, for in a few hours I shall be whirling back to my native home; and ere many weeks are passed I shall be closed in by piled-up snow-heaps that will shut out the noise and din of the far-off but ever busy London. So adieu till we meet again; and believe me,

Dear Frank,

Yours sincerely,

SIMEON HEADSMAN.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE second monthly meeting of this Society for the season was held on Tuesday evening, the 4th inst., at King's College,—Peter Le Neve Foster, Esq., V.P., in the chair.

The minutes of the last meeting having been read,

Mr. WATSON objected to them on the ground that they stated that Mr. Rothwell's paper had been read at the last meeting, whereas the fact was that only the merest fragment was read on that occasion, so that those members who had not had an opportunity of seeing the paper beforehand could not understand the subject. The paper could not be said, under these circumstances, to have been properly "discussed," and he thought it would be as well if the paper were again brought before the Society.

The CHAIRMAN said he was sorry to say that Mr. Watson was irregular, and could not be heard upon the subject. If there were any objection to the course of proceeding it must be taken before the council. The statement in the minutes was that "portions" of Mr. Rothwell's paper were read.

The minutes were then confirmed.

The following gentlemen were balloted for, and declared duly elected members of the Society:—E. L. Lloyd, Esq., W. Rowles, Esq., G. Wharton Simpson, Esq., and William Gray, Esq.

The CHAIRMAN said at this meeting they had to act under the 7th rule of their Society relating to the election of their officers. The following were the names of the gentlemen retiring by rotation:—Messrs. Roger Fenton, V.P., T. F. Hardwich, Henry Pollock, F. H. Wenham, Mackinlay, and Marshall.

Professor Bell was recommended for election as Vice-President, making another vacancy in the council.

The Earl of Caithness, Messrs. Roger Fenton, Walter Hawkins, Warren de la Rue, T. R. Williams, and Rev. J. B. Major, were recommended for election.

Mr. ROBINSON exhibited his large photograph from the life, called *The Holiday in the Woods.*

Mr. ZETZLER, of Sydney, New South Wales, exhibited a series of stereoscopic views of that country.

Dr. RYLEY then read a paper *On the Result of a Series of Experiments on the Collodio-Albumen Process*, &c. [see page 367], and exhibited illustrative specimens.

The CHAIRMAN stated that some of the plates were prepared six months before they were exposed.

Dr. RYLEY said that during the course of the experiments it struck him that the success he had met with might be owing to the coagulation of the albumen allowing the developer to penetrate the film more freely, and that he might be attributing to the sensitiveness of the plate that which was due merely to the more favourable action of the developing solution. He accordingly proceeded to perform the following experiment:—He took the plate out of the nitrate bath, thoroughly washed it from every trace of free nitrate, coated it with albumen, and allowed it to dry without artificial heat, and then exposed. Before developing he redipped it in the nitrate bath, and then tried to develop the picture, but it proved a failure, thus clearly proving that the success in the cases stated in his paper was due to sensitiveness produced by the coagulation. He wished the question, as to whether the result was due to a structural or chemical alteration in the film, to be fully discussed, as he was not sufficiently versed in chemistry to decide the point, although he was rather inclined to believe that the alteration was only structural. When the plate was redipped in the nitrate bath it would only keep three days; when dipped in gallic or tannic acid the plate would keep any length of time as long as it was kept dry. The plates exhibited great sensitiveness when iodised with the metallic iodides. In using the nitrate of cadmium he found, after washing away all free nitrate, enough remained to alter the structure of the albumen; but on developing the plate it was full of blisters, proving that nitrate of cadmium could not be used for that purpose. If that objection could be overcome it would certainly be the best.

Mr. HARDWICH said that he had experimented upon the sensitiveness of plates prepared with gelatine and gum, as compared with those prepared with albumen. He had found the gum first in sensitiveness, the gelatine next, and the albumen last. He considered it was necessary to coagulate the albumen with nitrate of silver by redipping the plate, if it were desired to obtain the maximum of intensity. By intensity he meant what some termed *contrast—id est*, the opacity of the high lights as compared with the shadows. If the albumen were coagulated in any other way it lost a certain portion of its intensity, and a pale negative was the result. The hot water method might answer for a short focus lens and a brilliantly illuminated object; but not for a long focus lens and a badly lighted object. The action of gallic acid he found was to increase the intensity of the albumen negative, but he did not find that it increased its sensitiveness—rather the reverse. Thus, if he exposed the plate with a lens of long focus without sun, he found the picture exhibited more detail in the shadows when no gallic acid was used, but that the intensity was not so great. It would therefore appear that gallic acid increased the intensity and diminished the tendency to solarisation. In another experiment he took one of Taupenôt's plates, and washed one half in salt and water, and the other half in distilled water. On exposing the plate, the development was more rapid on that part washed in distilled water; but eventually he obtained as much detail in the other part washed with the salt water. Thus he found that salt retarded the development but did not affect the sensitiveness. He washed another plate in salt and water, and then in gallic acid, and the result was that the plate was restored to the same state with respect to contrast and intensity as if he had not washed away the nitrate. If the whole of the excess of the nitrate of silver were washed away, the contrast could be restored by the use of a reducing agent. Dr. Ryley regarded the effect he produced as owing to an alteration in the structure; but he (Mr. Hardwich) regarded it as owing to the chemical nature of bodies which tended to reduce the nitrate of silver to the metallic state. The plates prepared by Messrs. Petschler and Mann were not so intense as those prepared by Taupenôt's process, but they might be rendered so by washing off the albumen and dipping them in gallic acid.

Mr. SEBASTIAN DAVIS said he had been experimenting upon the collodio-albumen process for some time past. He prepared plates, and washed away all the free nitrate, and coated them with albumen. He then placed the plates in an atmosphere of dry air at 180 degrees to coagulate the albumen; on exposing the plates he found they possessed little or no sensibility to the action of light. This would appear to contradict the theory, that it was only necessary to coagulate the albumen to produce sensibility. He then dipped some plates in boiling water instead of exposing them to hot air, so as to wash them at the same time. The plates so treated were far more sensitive, but not so sensitive as the Fothergill plates. He concluded that by washing away all nitrate of silver, sensitiveness was lost to a great extent. Having washed away all the free nitrate of silver from one of Messrs. Petschler and Mann's plates, he washed the plate with chloride of ammonium, when he found that it possessed but little sensitiveness in daylight before washing, even when he had exposed it for two or three hours; but after washing it became as sensitive as if it had been redipped in the nitrate bath. Before the plate was washed in water, however, it had a certain amount of sensibility to solar light. By washing a plate first in distilled, and then in common water, the free nitrate of silver was removed; but by washing it first in common water the nitrate of silver was converted into chloride of silver which remained in the film, and might make a difference in the sensibility. It appeared to him, from one or two experiments, that chloride of sodium had a greater power of retarding light than chloride of ammonium.

Dr. RYLEY said his only object in bringing his paper before the Society was to elicit truth. He would rather it could be proved that the results he had obtained were owing to chemical instead of to structural alteration. He must confess, however, that Mr. Hardwich's argument had not entirely convinced him, because the fact still existed, that if he prepared a plate in the usual way, and after washing away every trace of free nitrate he coated it with albumen, and then dipped it for two or three seconds in hot water, the plate so heated became very sensitive indeed. In the course of six or seven seconds with a good light, a most excellent negative would be produced by such a plate, which, he contended, was intense as well as sensitive. Could Mr. Hardwich inform him how it was that the sensitiveness as well as intensity of the plate was increased by the coagulation of the albumen by hot water? Sulphate of iron, acetic acid, and alcohol would produce a similar effect, but not to the same extent.

Mr. HARDWICH said that the hot water might perhaps wash away the soluble chlorides and phosphates from the albumen. That might account for the fact, that the coating of albumen coagulated by dry heat was not so sensitive. In the remarks he had made he had endeavoured to direct the attention of the meeting to the method of producing the most

intense—not the most sensitive—plates. He considered that however carefully the chlorides might be washed away from the film by hot water, the negative, especially in the sky, would not be so intense as if the plate had been redipped in the nitrate bath.

Dr. Ryley said he found that by altering the structure with gallic acid he obtained a more intense negative than he could get by redipping the plate in a nitrate bath.

The thanks of the meeting were then voted to Dr. Ryley for his paper.

The Chairman said he held in his hand an instantaneous photograph taken by Mr. S. Fry, by Taupenôt's process. Mr. Fry would give them a paper on the subject at their next meeting.

Mr. Thomas, before reading his paper, said the subject of varnishing the negative was one of great importance, and had not yet received the attention it deserved. He had been able to gather the opinions of many large collectors, and he was enabled to state that in nearly every instance the cracking of the varnish was not owing to any peculiarity in the varnish or in the film, but to want of care and caution in carrying out certain simple rules. He did not believe in the cracking of any good varnish if the film were properly washed; neither did he believe that cyanide of potassium was more likely to cause the varnish to crack than hyposulphite of soda. The fact was that people did not wash off cyanide of potassium so carefully as they did hyposulphite of soda, although it really required quite as much washing.

Mr. Thomas then proceeded to read a paper on *How to Varnish the Negative*. [See page 370.]

After reading his paper, Mr. Thomas added that wherever cyanide of potassium was used as an agent the negatives were more prone to crack—not because the cyanide of potassium had any action on the film more than the hyposulphite of soda; but that there was a general impression that the cyanide of potassium required very little washing afterwards, or not so much as the hyposulphite of soda would require. He (Mr. T.) was of opinion that cyanide of potassium required quite as much washing as the hyposulphite of soda, and, from the information he had obtained, he thought he should make it clear that wherever hyposulphite of soda had been used the soda had been much better washed than the cyanide of potassium, and generally the negatives had been more prominent, and that no cracking had taken place, except in a few cases under circumstances which only went to prove the rule. Last year, on attempting to apply amber and chloroform varnish, in a room over an outhouse, where there was never a fire, in very damp weather, it was impossible to get a clear varnish. The dampness of the atmosphere prevented the absolute hardening of the surface of the negative. He thought that, just before varnishing, the back of the plate should be brought over the flame of the spirit-lamp, to drive off any moisture which the film might hold. He did not think that any film, put by for a few hours, could be absolutely dry; even the atmosphere contained a certain amount of moisture. That moisture, he had no doubt, was quite sufficient to account, at times, for the cracking of negatives. It was a great mistake also, which many people made, to condemn amber and chloroform varnish on that account. They were very much in the habit of pouring it on and pouring it off immediately, fancying the rapid evaporation of the chloroform would be a great loss; but he did not think it evaporated so quickly as was supposed, and it was as well to allow the chloroform varnish to soak into the film for twenty or thirty seconds, which left a very good body; and if it were thought desirable to repeat the process, it should be done at once. "The varnish must not be dashed off." That was another point; for he was endeavouring to describe the perfection of varnishing, which was to leave on the surface of the negative as fine a coat or surface as the other side of the patent plate itself.

Dr. Diamond said he had first used amber varnishes in 1851, but he had found great difficulty in procuring pure amber. A great part of the amber sold in London consisted of what was called "Highgate resin." Varnishes made from bad amber did not become hard. The advantage of amber was, that it perfectly withstood damp. He differed from Mr. Thomas in thinking that amber varnish would not stand hard work, for he never had occasion to find fault with it in that respect.

Mr. Thomas said amber might be tested by biting it. Fictitious amber crumbled under the teeth—while true amber did not.

Mr. Hardwich said he agreed with Mr. Thomas, that where cold varnishes were used the plate ought to be previously warmed, as the film did not perfectly dry without heat. He found on one occasion that when he used varnish prepared with absolute alcohol the entire image disappeared, the pyroxyline being dissolved by the alcohol. A very small quantity of water, say four or five per cent., mixed with the alcohol, would prevent such an action, and he wished to know whether that quantity of water would injure the varnish. Some collodions would give way under the action of absolute alcohol, especially when the pyroxyline was prepared in very weak acids.

Mr. Thomas said he did not think that such a small quantity of water added to the alcohol would make any material difference. There would be no difficulty in obtaining a solution of the gums in alcohol ·830 in strength.

Mr. Hardwich said alcohol ·808 in strength would not affect the pyroxyline, but ·802 in strength would.

Mr. Thomas said the only objection to adding water to the alcohol was, that it made the varnish somewhat thicker. The more fluid the spirit varnish was the better, because it then interposed between the surface and the negative a very thin coat. If spirit varnish must be used, he should prefer the use of absolute alcohol if it did not injure the image.

Mr. Sebastian Davis said the image in the first negative plates he varnished entirely disappeared. On applying to the dealer about it he was told that it was French spirit varnish, and that if the stopper were left out of the bottle for some time, so that a certain quantity of water might be absorbed from the atmosphere, so as to reduce the strength of the alcohol with which it was made, the evil would be remedied.

Mr. Fry asked whether any one had found Sœhnée varnish crack? He had had two plates, 18 by 15, totally destroyed by the varnish cracking.

Mr. Thomas asked whether that was Sœhnée varnish?

Mr. Fry said it was not. He did not know what varnish it was. He thought that an inquiry ought to be made, when cracking occurred, as to what varnish had been used, and under what circumstances it had been kept, whether in a dry room or otherwise.

Mr. Downes said on one occasion he had employed Thomas's varnish, and it dissolved a large part out of the film. That varnish he thought was prepared with absolute alcohol. He had never found that defect in Sœhnée varnish; but, whether that was owing to its containing a small amount of water he did not know. With respect to the observation made by Mr. Fry, he found that all varnishes would crack if kept in a damp place. The cracks did not form interstices, but appeared to run up between the surface of the plate and the collodion. With reference to Mr. Hardwich's observation, that the film did not dry properly without the application of heat, he found that when the film was dried simply by the ordinary temperature of the atmosphere it could be removed with great ease by wiping the edges with a cloth; whereas when dried by artificial heat, the film adhered closely to the plate, showing that a very considerable amount of water had been driven off by the heating.

Mr. J. Williams said that he had had considerable experience in the manufacture of photographic varnishes. He thought the use of absolute alcohol an error. His own opinion was, that a mixture of absolute alcohol and ordinary spirits of wine of 60 over proof (which would give a gravity of about ·818) was the strength best adapted for the preparation of spirit varnishes. He did not agree with Mr. Thomas as to the use of the gums he had mentioned; but he considered that gum lac should enter into the constitution and form the basis of every spirit varnish. He thought the lac used should be bleached, powdered, and dried before being dissolved. With respect to amber varnish, he thought it important to bear in mind that the chloroform must be quite pure and not the methylated article, which he had found would not answer, but remained tacky. The chloroform should also be perfectly free from alcohol. He did not think there was so much difficulty in procuring *genuine* amber as Mr. Thomas had said, although the amber in commerce might not be quite *so good looking* as the amber from which mouth pieces were made. Some eminent makers of amber varnish were in the habit of using a mixture of chloroform and ether. His own opinion was not in favour of such a plan, and in his hands such a varnish had turned out bad; he, however, believed that it was considered an improvement by some operators—its principal advantage, perhaps, being that a fluid and a weighed ounce of the varnish would occupy about the same bulk, and the purchaser therefore got more for his money than when he had that made with simple chloroform. There was another *cold* varnish in use which ought not to be left out of the discussion. He alluded to the benzole varnish. The basis of this varnish was generally gum dammar, but it was very necessary that the benzole should be quite pure: that met with in commerce generally contained much fatty matter and would not dry, whereas pure benzole dried and left no stain or tackiness behind. When this varnish was made with good materials he knew it to be a good working varnish.

Mr. Fry said that gum dammar dissolved in benzole made a varnish which, if it had not a little inclination to bloom, was as good as any.

Mr. Quin said that when there was no open crack the plate might be heated, when the film would resume its position and would take a new coat of varnish: an open crack, however, was fatal. He had discontinued using amber varnishes, because he found that they would not stand hard work. He found gums became *tacky* when exposed to a hot sun for a long time.

Mr. Bedford wished to know if any member could tell him what was to be done when the cracking first made its appearance. Its progress was very gradual. It showed itself on a small part of the negative first of all, and if it could then be arrested, it would not do much harm; but in the course of a week or two it covered the whole surface.

Mr. Quin said cracking sometimes arose from over-heating the plate when the varnish was being applied. It ought to be just the heat of boiling water. He found the gum dammar stick to the paper when exposed to the sun.

Mr. Bedford said his reason for exposing the varnish to a great heat was to avoid its becoming sticky when warmed by the sun. It did away with that *tackiness* to which some of the spirit varnishes were liable. He thought Mr. Thomas's suggestion of well washing the plate before varnishing deserved the gravest attention.

Mr. Hughes said, amber varnishes were very easy of application, while benzole, or "crystal-varnish," was more difficult to manage. Sœhnée varnish was prepared by a very old firm in France which had a reputation for its varnishes before photography was discovered. In his opinion it was

a most excellent varnish, although some persons said it was too thick, and others that it was too thin. Gum dammar dissolved in benzole certainly possessed many advantages; but he could not recommend it, as it was not hard, was not substantial, and it left the negative in much too unprotected a condition. After twenty, thirty, or fifty copies had been taken it showed signs of wear. The composition of the Sœhnée varnish was not known.

Dr. Diamond said the Sœhnée varnish was made from a formula by the late Dr. Ure. He did not know its composition, although it had been proved by analysis to consist of a combination of several gums.

Mr. Quin said he found lac in it.

Mr. Heath said he had never found Sœhnée varnish crack.

Mr. Bedford stated that on one occasion he had found Sœhnée varnish become *tacky*, and stick to the paper.

Mr. Thomas hoped that they would receive communications on the subject from the country. It was a good plan to remove the film from the edges of the plate, and to allow the varnish to flow over the margin so as to completely encase the film. He did not consider lac to be a hard varnish, as a sharp point would make a trace on it, which could not be done on the French or any other spirit varnish. He wanted to find out whether the cracking was to be attributed to the varnish or not. He thought that if the cyanide or hyposulphite of soda were properly washed off, and the film carefully dried, the varnish would not crack. He also thought the cracking was owing to the difficulty of applying the heat from a spirit lamp equally over a large surface. Last week he visited a number of gentlemen who possessed large collections of negatives for the purpose of inspecting their condition. He found that Mr. Kilburn, who had some thousands of negatives, used amber dissolved in chloroform, with the greatest success, not having had one case of cracking, except from want of care, either in washing or drying. He fixed with hyposulphate of soda, washed the plates freely, and let them dry spontaneously: he always warmed them to drive off the superfluous moisture, and allowed them to cool before varnishing. He then visited Mr. Herbert Watkins, who told him that he used all sorts of varnishes. That gentleman had some thousands of negatives, and always fixed with hyposulphite. He never had a negative crack; but he was always very careful to wash his plates well. He then went to M. Claudet's, and inspected his very large collection. For some years that gentleman used amber and chloroform, until this time last year, when, on inspecting his stock, he found two or three signs of cracking in the form of segments of circles. He became anxious, and jumped to the conclusion that it was owing to the amber varnish: he now used spirit varnish, and only one or two had since shown signs of cracking. He then went to Mr. Melhuish, who worked upon very large plates. He told him that he never had a negative crack—that he used all sorts of varnishes, but gave the preference to amber and chloroform. If any of his negatives cracked, he had been able positively to say that it was owing to some carelessness on his own part in washing or drying the film. He used hyposulphite, and always washed his plates very freely. He found that Mr. Bedford had a large collection, and that he had negatives cracked both with amber and spirit varnishes. He now used amber varnish. One very important point was that M. Claudet fixed with cyanide, washed it off rapidly, dried the plate over a flame, and varnished immediately. Thus, he thought, it was proved that where hyposulphite of soda was used, the plate well washed afterwards, allowed to dry spontaneously, the moisture being driven off by heat, and the plate allowed to cool, neither amber or spirit varnishes would crack; and where cyanide was used, the plate well washed and rapidly dried, both amber and spirit varnishes would crack.

Mr. Williams said Mr. Thomas unjustly condemned cyanide for fixing plates. That article, however, as generally sold, contained carbonate of potash, which might materially influence the action on the film or varnish. Before it was given up, it ought to be seen whether, when pure, it would have so injurious an effect as Mr. Thomas attempted to prove.

Mr. Thomas said he did not wish to condemn cyanide, but people thought that it did not require so much washing as hyposulphite, whereas it required equally as much.

The thanks of the meeting were then voted to Mr. Thomas for his paper.

The Chairman announced that at the next meeting Mr. Fry would read a paper *On Lunar Photography*.

Mr. Hardwich agreed to read a paper, in February, *On Albumenising Paper, and on the Alkaline Gold Toning Process*, for the purpose of introducing a discussion on this very important subject.

The Chairman said that the next meeting would take place on New Year's Day.

The proceedings terminated with the usual vote of thanks to the chairman.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of the members of this Society was held on Wednesday evening, the 28th ult., at Myddleton Hall, Upper Street, Islington,—George Shadbolt, Esq., V.P., in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Ottewill exhibited a new camera for taking instantaneous photographs, which was described at page 318 of the present volume of this Journal.

Mr. Shave exhibited a number of stereographs.

Mr. Moens read a paper, illustrated by numerous well-executed photographs, entitled *Notes of a Photographic Yacht Voyage in the Mediterranean*. [See pages 351 and 369.] The thanks of the meeting were voted to him for it.

Mr. Moens then exhibited photographs illustrative of his paper.

The Chairman said he wished particularly to direct the attention of the members to the dark box (which was also exhibited) used by Mr. Moens in his travels. It was, as they saw, very small and very primitive in appearance.

Mr. Moens said that the box was so constructed that everything necessary could be carried in it; and it was so fitted that at a glance it could be seen whether anything had been forgotten.

A Member asked what chemicals, &c., Mr. Moens took with him?

Mr. Moens said he took one complete set himself, and his friend took another. When they arrived at Carthage they got another complete set from Ross. Their apparatus and chemicals must have cost £250, but the greater part of them was unused.

Mr. Samuel Fry (of Brighton) asked whether Mr. Moens developed with iron or pyrogallic acid?

Mr. Moens said that he employed pyrogallic with acetic and citric acids. He said foreign photographers took nearly all their pictures with albumen plates, and were amazed that he and his friend could do anything with wet collodion. Certainly the heat of the climate, together with the dust and the trouble of carrying the necessary apparatus, made the wet process very inconvenient. He rather prided himself on having taken a glass bath out with him, and having brought it home again unbroken after travelling so far.

The Chairman, referring to an observation made in the narrative, said at first it seemed strange that English photographers should not be allowed to take views of the fortifications at Gibraltar; but of course it would not do to give the necessary permission to English and refuse it to foreign photographers.

Mr. Skaife then read a paper descriptive of his Pistolgraph [see page 368], and exhibited some of his chromo-crystals.

The thanks of the meeting were then voted to Mr. Skaife, who said the reason he called his camera a pistolgraph was because it worked with a trigger, and originally had a handle, and was sighted like a pistol. It was then held in the same manner, but he now held it against his chest. One of those he now produced was originally intended to take magnified photographs of *the flower snake* by means of a Stanhope lens. The motion of the shutters could scarcely be seen when looking at the front; but on looking behind a spark of light could be seen flashing like a diamond. In one instance a gentleman took a picture as he was riding in a carriage.

Mr. Morley asked what lens was used for the instrument?

Mr. Skaife said the lens was expressly prepared for it, and was a double combination.

The Chairman said it was very similar to the portrait combination.

Mr. Skaife said he used a ⅜ diaphragm for taking portraits, and a smaller one for taking landscapes.

The Chairman, referring to the apparatus on the table, exhibited by Mr. Ottewill, for taking instantaneous photographs, said it was much slower in its operation than Mr. Skaife's pistolgraph, opening by a single shutter from the bottom, whereas in Mr. Skaife's arrangement the two shutters opened from the centre.

Mr. Fry asked whether Mr. Skaife had ever tried the effect of a shutter opening from the top downwards, and falling back inside instead of outside. By that means the foreground was exposed longer than the rest of the picture: the shutter was moved by means of a multiplying wheel. By moving the wheel the eighth of an inch, the shutter was opened and shut. He had tried shutters opening every way, and he had found that method the most satisfactory in taking pictures of the sea. He objected to the shutter opening outside, as he thought it must shake the whole concern, especially when pressure was applied to an outside lever.

Mr. Moens asked whether the vibration would not occur after the shutter was closed, when it would not matter?

Mr. Fry said he found the vibration sufficient to spoil the picture.

Mr. Moens asked whether it would not be better to have two shutters —one to fall from the top, and the other to rise from the bottom, so as to meet half-way? He thought that where a long focus was used the shutter was better from the side, especially in sea pictures, where the foreground was as bright as the sky.

Mr. Fry said there were exceptional circumstances in reference to the sea; such as when the sun was opposite the camera, when the dark side of the waves would be towards him, or when the sea was of a green or yellow colour, as it frequently was.

Mr. Morley then exhibited his new mount for lenses.

The Chairman said all the diaphragms were arranged on a plate, as in a microscope. He would recommend that the plate should be fitted with the usual catch, which would insure the opening being placed in its true position.

After some further conversation,

The Chairman announced, in reference to the copies of photographs to be presented to each member, that the Committee had selected a negative by Mr. Wilson, of Aberdeen, from which the copies were to be printed. As Mr. Wilson was to print them himself, of course it would be some little time

before they were distributed. The next meeting—the last of the year—would take place the day after Christmas Day.

The proceedings then terminated with the usual vote of thanks to the Chairman.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A Meeting of the above Society was held in the Rooms of the Literary and Philosophical Society, 36, George Street, on Wednesday, the 5th instant,—Mr. Parry in the chair.

The Secretary announced that Mr. Dancer would at the next meeting provide the necessary apparatus for exhibiting photographic transparencies by the oxy-calcium light, and members were invited to contribute pictures. It was particularly requested that they should be on the whole stereoscopic plate, for the convenience of adaptation to the lantern.

It would be recollected that at the last meeting a committee was appointed to consider a suggestion thrown out by him in reference to an Exchange Club in connexion with the Society, and he had now to submit a series of rules founded on that suggestion.

The chief objects kept in view were to afford every member means by which he could judge for himself as to the value of the picture he would have in exchange, and to keep up a continuous circulation.

RULES OF THE EXCHANGE CLUB OF THE MANCHESTER PHOTOGRAPHIC SOCIETY.

1. That a portfolio (No. 1) be kept for the reception of pictures offered in exchange, each picture being marked with a consecutive number.
2. That a portfolio (No. 2) be kept for the reception of pictures offered in exchange for those contained in No. 1.
3. That every picture deposited in No. 2 be marked with the particulars of the exchange desired—as, for instance, "offered in exchange for picture No. 1." But more than one picture may be mentioned as desired in exchange; it being assumed that the first-mentioned is preferred, and so on.
4. That pictures designed for exchange shall be delivered to the Secretary, who shall number them, and place them in the portfolios according to the order in which they are received by him.
5. That upon a picture being placed in No. 2, the Secretary shall communicate with the owner of the picture in No. 1 desired in exchange, and if such owner give his sanction, the exchange shall be effected. If the owner of the desired picture do not reply to the communication of the Secretary before or at the ordinary monthly meeting of the Society next following the date of the said communication, then his sanction to the exchange shall be assumed. But no such communication from the Secretary shall be made so as to afford less than fourteen days' notice.
6. That in case there are two or more pictures in No. 2 for which the same picture in No. 1 is required, the preference shall be given to the earliest applicant, as shown by his number.
7. That boxes be provided for the reception of pictures on glass of stereoscopic size.
8. That no picture be admitted which is not accompanied by these particulars:—Subject, process of negative, date and hour of exposure, length of exposure, focus and stop of lens, quality of light, print, how toned; and that the Secretary provide printed forms, to be filled up by the member exchanging.
9. That a picture deposited in No 1 shall not be withdrawn.
10. That there shall not be two prints from the same negative in No. 1.
11. That two or more pictures may be offered in exchange for one.
12. That no member shall have the power of exchanging who has not contributed a print to No. 1.
13. That stereoscopic pictures on paper be mounted; all others on paper unmounted, and not cut round, so as to leave a margin to which the required particulars may be attached.

A discussion then followed on the proposed rules. It was considered that the most probable cause of failure would be a falling off of the quality of the pictures in No. 1; but the general feeling was in favour of trying the system.

Mr. Offer moved, and Mr. Patterson seconded, a resolution to that effect, and it was carried unanimously.

The Secretary read a letter, forwarded byMr. Kirby to the chairman, and accompanied by a number of photographic transparent pictures, burnt into glass by M. Joubert's method. He observed that there appeared to be some deficiency in half-tone, even in those which were copies of engravings; and he believed that transparent photographs taken by the ordinary means were more brilliant; and unless, therefore, they could be produced at an inferior cost, he did not perceive any great advantage in the new method.

Mr. C. Jabez Hughes, of London, remarked that the Secretary had not, he thought, considered the absolute permanence of the burnt-in photographs. The great advantage would be found in their taking a commercial place for the decoration of our house windows, conservatories, and in many similar applications, under circumstances which would speedily destroy ordinary photographs. The previous evening he heard of a case in which a number of negatives were lamentably destroyed by atmospheric influence, although they were kept in a box; how much more then must we expect them to be injured in situations such as those he had mentioned? It was true that in all those processes which are founded upon the use of a chromate, they lost some detail; but then they had secured really good designs, which were permanent.

The Secretary thought that the objection to ordinary photographs could be fully met by covering them with another sheet of glass; but if a further precaution were desired, we had only to cement the two glasses with Canada Balsam.

Mr. Pegg, who had at one time been connected with the manufacture of ornamental glass, said that although M. Joubert's designs were now in one colour only, they might, he believed, be converted into pictures of several colours, by taking them as they now are, and submitting them to several burnings, with as many applications of colouring matter.

Mr. Hughes believed he might venture to say that Mr. Pegg's suggestion had been anticipated by M. Joubert.

A vote of thanks was passed to M. Joubert and Mr. Kirby for their kindness in forwarding the specimens.

A number of transparent stereoscopic pictures, taken by the hot water process of coagulation, were handed round by Mr. Herbert and Mr. Parry. The latter of these gentlemen introduced the pictures to the Society; but it subsequently appeared that Dr. Ryley had previously suggested the process.

Mr. Parry then acknowledged that fact; but said that he believed the thing had never been practically carried out previously to the reading of his paper. He found that it was necessary to keep up the temperature of the water or there were symptoms of blistering. He was not prepared to state exactly what that temperature should be; but he believed that from 180° to 200° would secure success.

The pictures shown were much admired, and there were no symptoms of unequal coagulation of the albumen. A conversation arose as to the degree of density required in pictures for the lantern.

Mr. Wardley stated that they were frequently printed too thin. The best effects were obtained by a fair depth of printing: he had seen some most striking effects from dense pictures.

Mr. Rogerson said that much must depend upon the strength of the light used, and upon the distance of the lantern from the screen. The Secretary asked Mr. Hughes if he could throw any light upon our failures in toning prints upon paper? the complaints appeared to be rather on the increase.

Mr. Hughes believed that the albumenising was conducted as well as it had ever been, but that the new method of toning required conditions peculiar to itself. The chief requirement, he thought, was a fine even surface on the original paper: without that quality the albumen was unevenly deposited, and gave rise to minute valleys which rendered the toning unequal. He had been prevented by the weather from concluding some experiments he had been conducting on this subject, but hoped shortly to resume them.

Mr. Wardley stated that he was convinced, by observation, that albumenised paper suffered in its toning quality by keeping. In a month or two the effect could be found, and in a year or two the paper would not tone at all.

A conversation then arose on the waxed-paper process; and it was generally agreed that the knowledge that they possessed of the principles involved in development afforded reasonable grounds for believing that it might afford most satisfactory results, if as much attention were given to it as was bestowed upon the dry process on glass.

Mr. Hooper and Mr. Rogerson, who have both produced this year some beautiful negatives in waxed paper of a large size—the latter on the whole photographic sheet—stated that one great thing to be observed was ample exposure, there was then but little silver required in the development, the negatives were sufficiently transparent, and that grainy effect so much complained of was avoided.

The proceedings were then brought to a close by a vote of thanks to the chairman.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The usual monthly meeting of this Society was held on the evening of Tuesday last, the 11th inst., in George Street Hall, Edinburgh. The chair was occupied by T. B. Johnstone, Esq.

The minutes having been read,

Mr. Walker read a few notes on the Macnair process, which he said, for amateurs, was a very good process if carefully manipulated; although he thought that among the dry processes the collodio-albumen, or Taupenôt process, was without a rival, as it gave results which could not be attained by any other. In his remarks he called attention to the chief defects of the Macnair process; which were—liability of the film to crack and peel off in flakes, and a tendency to stain during development. If a collodion, excellently adapted it might be for the wet process, but of a horny, contractile character, were employed in this process, there was no certainty that the film, when dry, would not crack and peel off. The best collodion for this purpose was that which gave a powdery or, as it was termed, a "rotten" film. It could easily be ascertained when it was in this condition by pouring some on a plate of glass, and pushing it forward with the finger. This kind of collodion was prepared by using pyroxyline, made with acids, at a high temperature: it was also necessary that it should contain a larger proportion of alcohol than ordinary. Without collodion of this kind there would be no certainty of obtaining good results by the Macnair process. He always preferred a neutral to an acid bath. With regard to the washing after excitement, he thought it was commonly carried to an excess. Nothing more was required than that the plate be washed till "greasiness" disappeared. More than this he considered injudicious. The strength of the malt solution originally given by Mr. Macnair was too great. The best proportions were two ounces of malt to ten of water: one coating was as good as half a dozen.

He dried the plates as quickly as possible, and when dry he varnished the edges. This prevented the water getting under the film and carrying it off. The exposure in the case of recently-prepared plates was about a third longer than wet collodion; but if the plates had been kept any time longer exposure was necessary. After exposure the plates had to be subjected to a most thorough washing to get rid of the malt; for, if any were left on the plate, a stain in developing would inevitably follow. With respect to a suitable developer he had not yet arrived at a satisfactory result. Iron was cheaper than pyrogallic acid, but it was also much more liable to stain the plate, and in using it there was no certainty of a clean picture. He hoped this objection would yet be got over. Perhaps gallic acid would produce clean pictures; but the time occupied in developing pictures by it was an objection. In fixing, he had formerly used cyanide of potassium; but finding this had a tendency to weaken the negative, he had given it up in favour of hyposulphite of soda.

In the course of his remarks, Mr. Walker exhibited severel stereoscopic negatives containing cracks, tears, stains, marblings, and other defects, as illustrative of the peculiar defects to which he had alluded.

Mr. MACNAIR said he was aware of a good many instances of failures occurring by the splitting off of the film, and he could say from experience it was a most disgusting thing when this occurred with an otherwise good negative. He did not think this was the fault of the preservative, but of the collodion. He proposed, as a remedy, that the plate be varnished over with some vegetable gum, or perhaps with albumen, before the collodion be poured on. He also suggested that a small quantity of grape sugar might be added to the collodion, which would prevent it drying so hard. With regard to the washing after exposure, he considered it absolutely necessary that every trace of the malt solution should be thoroughly removed; but, as it was not easy to know when this was properly done, he would advise that some very powerful vegetable colouring matter—a strong yellow for instance—be mixed up with the wort, and in washing the absence of this colouring matter from the surface of the plate would be a guarantee of its freedom from the preservative.

After some remarks from Messrs. Orange, Nicol, and others, a vote of thanks was moved to Mr. Walker.

Mr. TUNNY then read a paper *On a New Method of Decolorising the Albumen Silver Bath.* [See page 363.]

An interesting conversation followed Mr. Tunny's paper, in which Mr. Moffat and Mr. Nicol took part.

The thanks of the meeting were unanimously awarded to Mr. Tunny for his communication; after which, on a request from the Chairman, Mr. Tunny kindly showed to the meeting the manner in which he made his ammonio-citrate of silver bath, further particulars of which will be communicated in our next.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

THE third ordinary monthly meeting of the session of this Society was held in the Religious Institution Rooms, on Thursday, the 6th instant,—Mr. A. M'Tear, one of the Vice-Presidents of the Society, in the chair. The subject of photographic printing, continued from last meeting, was ably opened by Mr. A. Macnab in a paper which we give in another column. [See page 362.]

As several other subjects had to be taken up and disposed of, the discussion on the paper and the subject of printing was briefer than it would otherwise have been.

Mr. JOHN JEX LONG said he had been experimenting a good deal recently on this subject, and he did not see the benefit derived from crystallising silver, seeing they could generally get it pure.

Mr. J. STUART said he had not been troubled recently with the oily marks mentioned by Mr. Macnab; and, when he had, he merely worked on with the bath, and found it disappeared. He adhered to his formerly expressed opinion regarding the best light for printing in. Within the last three months he had made £20 worth of gold into chloride, and found it cost him 1s. 9d. for each fifteen grains. In his daily practice he adopted the plan of throwing down metallic silver by copper wire from the various washings, except the hypo. bath and washings. The silver so obtained he made into nitrate, by adding nitric acid. To this product he added water, and used it for printing. By using a little meter they could test the amount of silver in the bath.

Mr. M'FARLANE asked if there was such a meter?

Mr. BOWMAN said there was, and it had been found to answer very well.

Mr. M'FARLANE said he had asked an optician about this meter, and he was told that no such thing had been discovered as a correct test.

Mr. JOHN CRAMB said the instrument referred to only indicated the specific gravity of the liquid, and consequently the amount of solid contents, if they knew the kind of liquid used, but did not inform them whether they had nitrate of *silver* or nitrate of *potash.*

Mr. BOWMAN said that if Mr. Cramb had put the meter in a thirty-grain solution he would find it stood at 30°.

Mr. JAMES CRAMB said the objection to this meter was in the case of old baths, and not to newly-made ones, which it was known only contained silver and water.

Mr. STUART said he had only recommended the use of this meter to a known solution of silver and water to test its strength.

Mr. JOHN CRAMB reiterated his conviction that the meters referred to were useless, and a snare and deception. Nothing, it seemed to him, but analysis would inform them, with any degree of certainty, how much silver remained in a used bath, and that was almost the only use one had for such an instrument. The use of a solution of common salt, of known strength, and marking how much was required to precipitate all the silver in a measured quantity of a bath, was a simple way of doing so. Though giving his opinion freely on the meter question, he personally felt little interest in it. He had never used a silver meter; possibly his manner of proceeding would have to be called a rough one, but he never felt curious to know what *was in* a bath, so long as it gave good pictures. Before sitting down, he (Mr. Cramb) proposed that the thanks of the Society be awarded to Mr. Macnab for his paper, more particularly as he had been the first to operate before the Society.

The vote was heartily given, and Mr. MACNAB, in acknowledging the compliment, said it had cost him two days' labour to bring those experiments before them.

Mr. J. STUART said there was another matter—that was, the recovery of silver from spoiled prints. In the best-conducted establishments there were necessarily a few spoiled prints. He, of course, had some—one a day, perhaps. These he collected and burnt. By *fusing* the *ash* so obtained with carbonate of soda metallic silver was obtained. Recently he got £4 15s. worth of silver in this way from the waste prints collected in six months; and as some were toned, he also got fully a drachm of gold.

Mr. JAMES CRAMB asked if any gentleman present had recovered the silver from the hyposulphite bath?

Mr. JOHN STUART answered that he had done so, to a small extent, by using the lever of sulphur, which threw down a black deposit.

Mr. J. JEX LONG said that hydrosulphate of ammonia would be found to throw down the silver.

Mr. JAMES CRAMB said the reason he asked the question was, that he had been asking the same question of some gentlemen he thought should have known, and the plans he had got seemed theoretically incorrect.

The SECRETARY suggested that Mr. James Cramb should give the Society the result of his experiments on this subject at the next meeting, as well as the notes he knew he had by him on the hyposulphite of silver.

The next meeting, it was resolved, should be a *conversazione*, to which the friends of members, ladies as well as gentlemen, would be admitted.

The Society afterwards adopted THE BRITISH JOURNAL OF PHOTOGRAPHY as their official organ; and, in connexion with this subject, resolved that papers read before the Society should become the Society's property, and could only be published through the Society's Secretary.

Mr. A. M'TEAR showed a print toned by the recently-published American toning-bath.

After several new members had been proposed, and the usual vote of thanks to the Chairman, the meeting separated.

BRADFORD PHOTOGRAPHIC SOCIETY.

A MEETING of the above Society was held at the Rooms, Chapel Houses, James Street, on Wednesday, the 5th inst.—Dr. R. Parkinson, the President, occupied the chair.

A large number of members attended.

The SECRETARY having read the minutes of the last meeting they were confirmed.

Mr. Smith and Mr. Sutcliffe were duly elected members of the Society.

The PRESIDENT then introduced to the meeting Mr. W. H. LEATHER, who favoured the Society by reading a valuable paper *On the Waxed-paper Process* [see page 365], which excited great interest, and gave rise to an animated discussion.

Mr. LEATHER: Before reading my paper, I beg to observe that there is nothing different, either in chemical preparation or manipulation, from what has, I believe, already appeared in print. Yet it has been my aim to make the paper as complete as possible, so that those parties desirous of making a trial may meet with success.

Several very fine negatives and prints by this process were exhibited.

The thanks of the meeting having been awarded to Mr. Leather for his paper, the Society adjourned until the first Wednesday in January, 1861.

Practical Instructions on Coloring Photographs.

BY ALFRED H. WALL.

CHAPTER VIII. *(Continued.)*

MATERIALS, &c.

VARNISHES.—Good varnishes should bring out the full force and brilliancy of the colours, and be hard enough to preserve the painting from injury. They are prepared chiefly from gums, or, more properly speaking, resins, dissolved in water, spirit, or oils, simple or compounded. Those more commonly used are mastic, copal, amber, and white lac.

Mastic Varnish is easily prepared by dissolving one part of the purest "gum" mastic in three of the rectified oil of turpentine,

and adding one part of fine turpentine. As this varnish is frequently adulterated, and it is advantageous to use the genuine article, it may be worth while, therefore, to prepare it for yourself when you cannot obtain it good. Mastic varnish is very apt to "chill" after application; but, by rubbing it with an old silk handkerchief, the colours regain their brilliancy.

Copal Varnish.—A harder varnish than the former, but somewhat dangerous in use, as it is very liable, from a variety of causes requiring very great care to avoid, to crack. To combat this peculiarity a little linseed oil is sometimes used with the varnish; but this again is objectionable, as on the picture it soon becomes dull and discoloured, and, moreover, causes the varnish, being somewhat of a magilp, to amalgamate with the painting itself, so that there is no chance of ever cleaning or restoring the picture to its original condition. I recommend the use of pure mastic varnish to all who have an interest in the preservation of their work.

White Lac Varnish.—Composed of purified lac resin, dissolved in spirits of wine. The chief value of this varnish lies in its hardness, transparency, and absence of colour. Being a spirit varnish it of course requires warmth to assist in its application. The amateur will experience so much difficulty in using it, that he will scarcely be wise to undertake the management of a material so intractible; but it may be used in preparing the photograph for the reception of oil colours, when it can be applied as follows:—Warm the surface of the photograph; then pour a little varnish into a saucer, and apply rapidly and lightly with a soft linen rag, which has also been warmed. In a few seconds it will be hard and firm enough to work upon. This varnish has another use in photographic colouring, by which I have seen excellent results obtained, even in the hands of very inferior colourists. Wash in the flesh, &c., in the way I have already described in the case of water colours; and when this is done, varnish as above, when, by simply glazing the whole with your oil colours, all the richness and brilliancy of oil may be obtained with the transparent character of mere water-colour washes. The picture so coloured will retain its beauty for many years perhaps, but it must ultimately fade. Colourists who, having no knowledge of drawing, cannot succeed in preserving likeness, cannot fail to retain the resemblance if they adopt this plan. In applying white lac varnish you must be careful that it is not too strong, that you do not rub too hard, and that the painting beneath is thoroughly dry and firm.

Amber Varnish has recently been used to some extent, but I do not recommend it. It has all the hardness and brilliancy of copal, but dries very slowly.

THE PAINTING ROOM.—That is a pleasant sound to me, for although folk curl their lips and nostrils when they enter it, with an outcry against the nasty smells of paint and turpentine, it is to me a charming odorous bower—a retreat from cares, anxieties, and annoyances—in which I can come with a wrinkled brow, and a fretful, impatient spirit, and, sitting down to my work, grow calm, patient, and happy, losing everything else in the absorbing interest of my progressing picture, and feeling fresh pleasure as, under my hand, it grows nearer and nearer to the dear image of my aspirations. Oh! the painting room is a charming place; and you must excuse my digressing in its praise, although I have not the slightest right to do, or excuse for doing, so.

I prefer that my painting room should have a northern aspect, because the light is then less variable, and we avoid the glare of direct sunlight. The window should be lofty, because a picture painted by a low light seldom looks well when seen by a top light. As the tone of your colouring will be affected by the amount of light you work by—pigments appearing different in a good and a bad light—let the window be large.

It is usual to paint with the window on the left hand, because the cast shadow of the hand then falls outward instead of over that part upon which you are working.

Hang up your best works in your painting room, unless you have better work from other hands, as they will reproach you with their mute eloquence whenever, from laziness, want of energy, or any other cause, you are going back instead of progressing.

Whatever you do, keep the room perfectly and scrupulously free from dust, which is the oil painter's greatest enemy. The room should have no carpet, but, in its place, oil-cloth, which can be wiped with a damp cloth every morning. A mat may be placed before your seat, in cold weather, for your feet, as your tenderly-prudent wife, sister, or mother would at once suggest, (what should we do without their careful love?) and nothing should be in your room that cannot easily be freed from dust. More than usual care is required in this respect when the work is so small and delicate in finish as coloured photographs are.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent with a stamped and directed envelope *for their return, to* A. H WALL, Esq., 11, THE TERRACE, WALWORTH.

JAMES K.—You have used too much and too thin a vehicle.

A LADY AMATEUR.—You have certainly used the proper pigments, but have mixed them in wrong proportions, thus producing a very comical result. However, as I am really anxious to do my best for pupils in THE BRITISH JOURNAL OF PHOTOGRAPHY, I shall be happy to help you out of the difficulty, if you will send me a large stamped and directed envelope, by enclosing a piece of paper with the tints mixed and applied, by way of guide.

GEORGE GRANT (Kennington).—These "Instructions" will, as I have before said, be published in a separate form.

CHROMO, No. 2.—See the remarks upon lac varnish, or use isinglass dissolved in gin.

A LADY.—You have certainly improved, but the flesh is still too chalky. The quality of "keeping," I am glad to find, has not been neglected this time. The greys are too purely blue. In answer to your question, I can only advise the use of ox gall, and recommend you to try Newman's preparation.

Foreign Correspondence.

Paris, December 10, 1860.

IN the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY I read the note presented to the Photographic Society of London by Mr. Malone, in which he attacks the conclusions drawn by M. Niepce de St. Victor from his investigations on the subject of light. In the interest of my learned friend (whose labours merit the serious attention of Mr. Malone, who seems to be misled) and of science (whose progress demands precision in results), I will, in brief terms, reply to M. Niepce's opponent.

Mr. Malone wished, he says, to ascertain whether the effects obtained by M. Niepce de St. Victor, and by him attributed to a hitherto unexplained action of light, could not be produced without the aid of that agent. For that purpose, what does he do? He takes the heading of a journal, *freshly printed*, and applies it to a sheet of sensitised chloride paper. After an hour's contact, he takes the whole from the frame, washes the sheets of paper with gallic acid, and so obtains a positive image of the printed letters, which he considers to be due to the penetration of the acid wherever the letters have been in contact. "*No light*," he adds, "*was used by me during the experiment*," which he thinks to be "*a simple repetition of M. Niepce's, minus the disputed agent, the light.*"

How is it that Mr. Malone, who is a serious man and a conscientious investigator, does not perceive the insufficiency of such an example? How is it that he does not understand that there is in the result pointed out by him one of those chemical actions which were, in the commencement, brought forward against M. Niepce, and were by him carefully eliminated from subsequent experiments, in order to prove that such chemical actions have nothing to do with his discovery; as he also proved that heat, and the other agents whose effects are frequently identical, have no part in the results which he announces?

As I am convinced of Mr. Malone's sincerity, and of his desire to arrive at the truth, I will ask his permission to indicate a very simple experiment which will destroy all his doubts. Take any engraving, on *sized paper*, which has been kept in darkness during a month, and expose one-half of it to the solar rays, care being taken to screen the other half therefrom, then apply it to a sheet of sensitised iodised paper. The contact must last twelve hours. On developing, you will have a negative image of the insolated portion of the engraving, while the portion protected from the luminous rays will have given no image. No further hesitation can exist, and it will be acknowledged that the light above has acted. Here I come to another objection raised by Mr. Malone. He reproaches M. Niepce with saying that certain bodies *absorb* the light. My friend is not justly chargeable with having so said. He has spoken of the *activity* which the light communicates to certain bodies submitted to its influence, and which enables them to reduce the salts of silver as light. But he does not say—what is very different—that they absorb the light.

It would be well for the general interest that several photographers should repeat the above experiment, or some of those described by M. Niepce, in his papers; but it is important that the instructions therein given should be exactly followed.

The printsellers have lately exhibited in their windows some very remarkable compositions by Mr. Robinson. I was already acquainted with a series of ably-executed works of the same kind by Mr. Rejlander, but I had as yet seen nothing by Mr. Robinson. I was struck by the artistic merit of these interesting productions; and I am happy to record here that the like favourable impression has been produced on the public, who have great difficulty in un-

derstanding how photography can be applied to the execution of such pictures, but who do not admire them the less. It is to be regretted that our own artists have not done more in this line than they have. With the exception of M. Ch. Negré and a few amateurs, who have published a small number of composed subjects, there are only the stereoscopists who have understood what a wide field is opened for photography in this direction. Most of the latter, however, are wanting in that artistic sentiment which is so necessary for such work. I have seen, with great satisfaction, the first specimens of a collection just commenced by Adam Salomon, a sculptor of talent, who is also a first-rate photographer. It consists of studies of expression, types, meditation, reading—the miser, the melomaniac, and others—in all of which may be discovered the experience of a master. The attitude of the model, the lights and shades, the arrangement of the drapery, the very accessories, have that stamp which art alone knows how to impress upon its productions: the execution is marvellous. Thus applied, photography vies with the ablest painting; for there is in these compositions a truthfulness, a fineness of detail, and a general harmony which remind you of the celebrated pictures by Gerard Dow. Adam Salomon will doubtless persevere in this direction; and if he finds zealous imitators among those painters who have adopted photography, we shall soon have works worthy of taking a place by the side of those of Mr. Rejlander, Mr. Robinson, and others.

I have just seen, at Count Sevastianoff's, a small portion of the *clichés* which he has brought back from Mount Athos. His collection consists of 4000 negatives, which he has transferred to paper for the greater facility of transport. I was, I confess, dazzled at the sight of the riches spread out before me: the old manuscripts, some dating from the sixth century, the illustrated bibles, the ancient maps, the *naïve* frescoes of Christian painters of the middle ages, the architectural details of half-ruined chapels, were all reproduced with pious zeal and extreme ability. Should the author publish this magnificent work, a world of treasures will be opened up to archeology, science, and art.

The activity which the approach of New Year's Day communicates to Parisian industry has begun to show itself in the operating-room. The portraitists are besieged by visitors who wish to offer their likenesses in all shapes and sizes by way of *étrennes*. The manufacturers of stereoscopes, and the makers and vendors of stereoscopic pictures, are unable to keep up with their orders, so great and increasing is the demand. In all the stationers' windows the card-portrait album takes its place, with gilded edge and chiselled clasp, by the side of the most elegant articles in vogue. These symptoms prove that the favour which the public accord to photography has increased during the year which is well-nigh gone. For the approaching year let us hope that the new printing processes will become practicable and be generally used, so that we may have to record a still larger development and wider dissemination of photography than in the past.

I close this letter, already grown too long, by wishing all those English artists who have kindly read it and its predecessors a merry Christmas and a happy New Year.

ERNEST LACAN.

New Books.

The Photographic News Almanack; or, The Year-book of Photography for 1861.

(London: Thomas Piper, Paternoster Row.)

We remember having heard of a man who complained of finding the long winter evenings "hang heavy on his hands," and was, therefore, recommended by a friend to amuse himself by reading. To which he replied that he had tried that for a week, but found it *very stupid*. On being asked what books he had read, his answer was—"Oh! a very good book: it was the *Nautical Almanack!*" Now, had this worthy met with the *Almanack* before us, he might have found it more entertaining; as, besides the calendar and list of photographic societies, with the names of the officers and days of meeting, it contains a large amount of "plunder" from the Journals—in most cases not taken bodily, but run through the melting-pot, and presented as a fresh-looking ingot. In employing the preceding simile, we do so only in a jocular sense; for there is no reproach whatever intended. On the contrary, professing it to be a *Year-book*, we think the author was bound to collect from the Journals what he regarded as especially worthy of preservation; and that he has presented the same in his own words, instead of giving a mere copy, testifies as much to his good sense as to his industry. We make this remark feelingly; for we are constantly disgusted by finding in another quarter *our* articles appropriated *verbatim et literatim*, without the smallest shadow of acknowledgment.

Under the head, "Annals of Photography," a retrospective glance is taken at the doings photographic of the past year; and this is followed by various processes and formulæ—whether old, new, or newly modified; and these are given under distinct heads, generally in a condensed and, therefore, useful form. There is also some information about patents, including a list of those connected with photography, granted during the year just closing.

Sundry tables, postal regulations, &c., are inserted as an appropriate conclusion to the preceding matter.

We feel rather amused at being called upon to review what might, in some sense, be regarded as a rival publication; but we take it as being both complimentary to our sense of justice and evidence of the kindly feeling entertained by the editor of a contemporary that we should have had the task imposed upon us.

The editor of this *Almanack* has not scrupled to express his own opinion upon many of the points discussed, instead of placing them drily before his readers; and, although in many of these opinions we do not coincide, and in some hold a diametrically opposite view to that taken by our brother editor, we cordially commend the course he has taken; for a fallible guide must surely be better than no guide at all. In conclusion, we have only to observe that the *Almanack, or Year-book*, is well worth the price charged for it.

The Art of Photographic Etching.

(By W. Strudwick, London.)

The author of this little pamphlet is evidently unaware not only that he is second in the field in his application of photography to the purpose of producing etchings, but that he is behindhand by four or five years at least. The use of a film of sensitised collodion upon a plate of glass for the reception of the original drawing by means of an etching needle was first suggested and applied by the late Mr. Peter Wickens Fry; and we remember to have seen proofs from plates so treated at one of the annual public exhibitions of the Photographic Society—we think in 1855. We have not at hand the file of catalogues, or a reference thereto would verify the date exactly.

We do not think this application of any particular value, as in our opinion a much simpler plan is to make the drawing on paper, and then obtain a negative, either in the camera or by direct contact with a dry collodionised plate in the pressure-frame. By this arrangement the trouble of making the drawing is certainly not increased, while the annoyance of having to reverse it is entirely obviated. When Mr. Fry first introduced the plan we made a similar remark; but at that time the former alternative alone was available, as dry plates were then in the womb of the future.

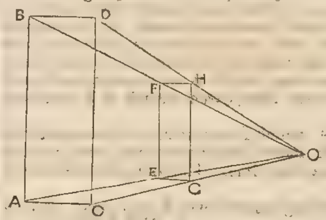
Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

PERSPECTIVE.

To the Editor.

Sir,—On reading the report of the proceedings of the London Photographic Society in your last number, I certainly was very much surprised to see the curious misunderstanding there was as to the way vertical lines should be drawn in perspective. It is always supposed in perspective that the plane of the picture is vertical and perpendicular to the axis of the eye. The plane through the eye and the vertical edge of a town is a vertical plane, and will intersect the plane of the picture in a line which will represent on the picture the edge of the town. Nothing can be more evident to my mind than that these two vertical planes will intersect in a vertical line, and that, therefore, the vertical edges of a town will be represented on the picture by vertical lines which will not converge.



Suppose A B and C D to be the vertical edges of the tower and O the eye. The two vertical planes O A B and O C D will intersect the plane of the picture in two vertical lines E F and G H, and E G will be equal to F H. It is quite true that B D will appear smaller than A C, because being further off, the angle B O D is less than A O C; but the eye being placed at O, the proper plane from which to look at the picture, F H will appear less than E G, in exactly the same proportion, and for the same reason, because the angle F O H is less than E O G.

Of course, if the plane of the picture is not vertical, and the axis of the eye not horizontal, vertical lines will be projected on the plane of the picture into lines which will converge and meet in the point where the vertical line through the eye intersects the plane of the picture. In general, parallel lines which are parallel to the plane of the picture will be represented by parallel lines which will not converge, or, in other words, their vanishing points will be at an infinite distance.

I do not think you were right in stating that the single eye was incapable of judging of distance. I think we judge of distance by having to alter the inclination of the axis of the eyes for objects at different distances, by observing that the angle subtended at the eye by any object is less the more distant the object, and by the light, shade, and colour being different for near and distant objects. Both eyes are, of course, necessary for the first of these means of judging, but one only for the others, which are the only means used in giving the effect of distance in a common picture.—I am, yours, &c., A. M.

Hereford, Nov. 23rd, 1860.

[This demonstration is precisely that which we employed.—Ed.

DRY PLATES WITH CHLORIDE OF GOLD.

To the Editor.

Sir,—I am but a few months old in photography, and but a very recent subscriber to your most valuable and interesting Journal; but, seeing the liberal attention which you bestow upon your numerous correspondents, I have ventured to encroach upon your time for a few minutes.

On receipt of Number 130 of The British Journal of Photography, for November 15 (to hand on the evening of the 17th), my attention was attracted to p. 337, where Mr. Mabley is requested by Mr. Petschler to lay before the Manchester Photographic Society the result of a weak solution of chloride of gold poured upon collodionised plates, after washing off all free nitrate of silver; and I determined to make the experiment. On Monday, the 19th, I prepared three plates, exactly according to the method recommended by Mr. John Parry (p. 298), with the exception that they were washed in a large pail of spring water,* with a jug—say eight or ten jugsful thrown very unceremoniously on to each plate—when, after draining for about half-a-minute, I flooded over each plate a weak solution of gold chloride—that is to say, of Mr. J. Stuart's solution (as given at p. 315), "one grain to one drachm," of which I took ten drops to an ounce of common water, and with this very weak solution—three drachms of which were enough amply to cover a plate—I kept it undulating for a minute, drained, flooded with the albumen solution of Mr. Parry, drained, plunged in hot water (a little under boiling), and dried by leaning the glass face downwards against a slanting-sided tin pot full of boiling water. The collodio-albumen coat was soon dry and hard, and I now beg to enclose three proofs of the result.

No. 1 is from the first plate, one hour after preparation, and exposed for fifteen seconds, at 2.30 p.m., with the small diaphragm aperture one quarter of an inch: it was snowing at the time, though the afternoon could not be called dark.

No. 2 plate was exposed the next day, twenty-four hours after preparation in the same way, for twenty seconds, and the sun was shining. I regret having let slip the extra five seconds; but it was done to make sure of getting the bark on the trees, which does not appear in No. 1. I feel certain that fifteen would have done.

No. 3 was taken next day, being one of other three plates prepared in same way, and twenty hours' old, as I had spoiled the last of the first lot. This No. 3 plate was exposed, at about 2.0 p.m., for thirty seconds, the day being rather dark, and clouds very low over the hills, but not low enough to touch the tops of the trees when the picture was taken, and I believe that less time would have done. All three plates have been developed with 1 part pyrogallic and 1 part citric acid, in 250 of water, assisted by the 2 per cent. solution of nitrate of silver, and fixed with the 2 per cent. solution of cyanide potassium, with which they have been very severely treated to remove the yellow iodide. You will see by the colour of the positives that I have got the toning-bath out of order, which is the most bothering part of the whole operation, and generally the most annoying.

The principal object of the present letter is to request that you will be kind enough to give me, in your next number, *a formula for the quickest collodion you know of*, as I go on with my experiments, and have now some hopes of getting a stock of dry plates for the summer, to take views as rapidly as with the wet process, which is so unmanageable and inconvenient on a journey. You see that *fifteen seconds is a very near approach.*

I also beg to enclose you No. 4, which I took with the plates made by the process recommended by Mr. Parry; but the day was dark, and the exposure five minutes, which is a long time. The fixing-bath is the old hypo.

You can make known anything useful which you may find in this letter.—I am, yours, &c., JAMES KENDALL.

Canton de Berne, Switzerland, Nov. 23, 1860.

* This (spring water) contains a chloride, as it becomes milky after washing the plates.

[We are obliged for the preceding communication, which is interesting; but we are of opinion that you err in judgment in supposing that either of the negatives from which you have sent specimens are over-exposed. With the exception of No. 4, they are *very much under-exposed*, and we doubt whether four times the exposure given would have been too much. Even No. 4 is under-exposed, though not very much; but it is far the best of the whole. We have already communicated a formula for collodion, and we now recommend you to alter your developer, in which you employ far too much citric acid—at the present time of the year especially. One quarter of a grain to one grain of pyrogallic will answer at this season; in spring you may possibly want half a grain; and in *very* hot weather what you now employ. In cold weather you will find protosulphate of iron 15 grains, citric acid 1 grain, powdered together in a mortar, then dissolved in 1 ounce distilled water, a good developer. Of course, before pouring on you must add nitrate of silver.—Ed.]

OBSERVATIONS ON TONING.

To the Editor.

Sir,—In reference to your correspondent's, "P. P.'s," remarks on my paper, which appeared in your issue of the 15th November, I have to observe that in them he betrays more ingenuity than honesty of purpose in construing several paragraphs to suit his own purpose, making it appear that I give preference to the old hypo. bath in opposition to the alkaline—a statement which the paragraphs read in their original form will not admit of, as I affirm. If he will be at the trouble of making a correct reading he will find that I give no preference to any of the named baths in point of permanence; but, in placing the merits of the baths in juxta-position before the theory of the President of our Society (see paper *On Influence of Heat and Light*), as before quoted, that the old hypo. bath would bear away the laurels in point of permanence—only, however, if the theory was correct. Even admitting that it is, does the bath receive more laudation at my hands than the others, but only as the old bath has been longest tested? In point of permanence, even with the benefit of a theory which, from the argument brought up to establish it, seems correct, it is still deficient; and, after the lapse of five or six years, the yellow symptoms of destruction appear. As to his longevity of alkaline prints, I don't think that *his experience* will corroborate his remark that *they will be found* as lasting as the most permanent engraving. Three years is but a short span compared with five or six; and because I have a print toned by the old bath three years of age, which looks as fresh as when first mounted, am I to infer that it will last for sixty years? This seems the reasoning of "P. P.;" but experience has proved (with exceptional cases, of course) that they will not last over five or six years; and consequently the presumption in favour of the alkaline bath (so far as age is concerned) is open to controversy.

It will do our friend's heart good to read a paper in your Journal of December 1st, by the Chairman of the Blackheath Photographic Society, on the same alkaline toning in opposition to the old bath, where something like scepticism in regard to durability of its prints appears. Instead, however, of my speaking in a light strain of the merits of an untested bath in point of age, I refer him to the following paragraphs, which seem to have escaped his notice:—"To the honour of the alkaline bath I have found very few failures, so far as regards toning," &c. Again:—"The advantage this bath (the alkaline) has over the *sel d'or* is, that there is less 'bother' in connexion with it, less tendency to engender acid principles, and consequently it involves the chance of rendering the prints a little more permanent, which is 'a consummation devoutly to be wished.'" Further, all the specimens illustrative of the fading away of photographic prints shown by me were by the old hypo. bath, so that I do not think our friend's remarks hold good that I uphold the use of such to my fellow-workers as the best means of preventing decay. But be it borne in mind that, in the present state of our experience, I still maintain that our toning and printing have not as yet gained us anything that we can otherwise but by *presumptive* assurance term permanent.

As to his other remarks, I deem them unworthy of my notice, and leave your correspondent to enjoy the glory of the vituperation given birth to by his own misconceptions and arrogance.

Thanking you for your impartial comments on both papers.

I am, yours, &c.,

Royal Arcade, Glasgow. JAMES EWING.

AUTOMATIC WASHING TROUGH.

To the Editor.

Sir,—The "Amateur Mechanic" writes truly when he says,—"Mr. W. Church seems to be in error as to the action of a syphon, such as described by 'H.;'" but he will have seen by this time that he has not read Mr. Church's letter attentively.

Before "H.'s" letter appeared, I had formed the same opinion of the "automatic syphon" as he had, and when I read your foot note, I began to puzzle my brain about the best method of constructing a self-acting valve such as you named; but before I did so, I determined to give it a fair trial—to do which I procured a box about 16-inches by 12, and about 10 deep. I next procured two pieces of the common lead gas-tube of

different diameters, and used the smaller one for filling the box, and the larger one for the syphon. The box was filled (*i.e.*, up to the level of the bend in the syphon) in about $9\frac{1}{2}$ minutes, and emptied in about 5 minutes. I then flattened the end of the small tube to make the orifice still smaller: the box was filled in about 13 minutes, and emptied in about $3\frac{1}{2}$ minutes. This time the syphon acted for 5 seconds as an overflow pipe, but at the end of that period the water came over and emptied the box as before.

You will perceive from the figures above given, that the syphon tube must have been at least *four* times the capacity of the feed tube. And I think I may safely assert that, within certain limits, in the diameters of the respective tubes any syphon will be self-acting. If a syphon of large capacity should be required, and found not to act, I feel confident that two smaller ones of equal height would answer nicely.

The reason why this syphon acts I take to be somewhat as follows:—Owing to the attraction of cohesion in the particles of the water every vessel requires to be *above full* before the liquid will overflow. This is the case with the tube. Capillary attraction does the rest, and brings the water out beautifully. Hence a very large syphon would not answer, while two smaller ones would.

I am much obliged to "H." for calling attention to the apparatus, as I feel confident it is the very best thing possible for my purpose, and one which even extensive printers may use with advantage.

I am, yours, &c., WATKIN.

REPRODUCTION OF MONUMENTAL BRASSES.

To the Editor.

Sir,—In your notice of my application of photography to copying monumental brasses, in your impression of the 1st inst., you have fallen into an error in describing the negative as being obtained by superposition, which would, even in the smallest brasses, require paper and pressure frames so large as to prevent the process from being adopted on the score of expense, and in the larger brasses this difficulty would be increased almost to an impossibility; for instance, the specimen which you mention as having received from me is a reduced copy of a brass about 5 ft. × 6 ft., the negative having been obtained in the camera by the collodion process, which process has the advantage over the Talbotype of being more transparent in the lights.

By inserting a correction of the above-mentioned error in your next impression, you will oblige.—I am, yours, &c., JOHN LOUCH.

Dec. 4th, 1860.

A RAP FROM A SPIRIT.

To the Editor.

Sir,—Your incredulity relative to the authenticity of spirit-rapping will surely meet with condign punishment.

Wishing to know if either M. Niépce de St. Victor or Mr. Malone were right in the views that they have expressed about "bottled" sunshine, I invoked the spirit of Dean Swift, and inquired whether he could enlighten me. He rapped out his indignation at the doubt, and referred me to Gulliver's Travels, Part III, Chap. 5, which treats of Gulliver's visit to the Grand Academy at Lagado, the metropolis of Balnibarbi, where I found the following:—

"The first man I saw was of a meagre aspect, with sooty hands and face, his hands and beard long, ragged and singed in several places. His clothes, shirt, and skin were all of the same colour. He had been *eight years* upon a project for extracting sunbeams from cucumbers, which were put into phials hermetically sealed, and let out to warm the air in raw, inclement summers. He told me he did not doubt that in eight years more he should be able to supply the governor's garden with sunshine at a reasonable rate; but he complained that his stock was low," &c.

So you perceive that it is not such a very new idea after all.

I am, yours, &c., RAP-PAREE.

SUPERIOR PERMANENCE OF PROOFS FROM PAPER NEGATIVES.

To the Editor.

Sir,—Having long been of opinion that photographs printed in sun light are more stable than those printed in diffused light, I was much pleased at reading, in your report of a recent meeting of the Blackheath Society, a statement to the same effect. I am inclined to go a little further, and hazard a conjecture, that proofs from calotype and waxed-paper negatives may be more permanent than those from collodion negatives, the former requiring longer exposure to the brightest solar light, in order to produce good prints, which, when taken from the pressure-frame, appear literally "baked" into the paper.—I am, yours, &c.,

A WAXED-PAPER MAN.

RAPID FILTERING OF IRON DEVELOPERS.

To the Editor.

Sir,—In the account of the discussion on Mr. Hervé's paper, read at the last meeting of the South London Photographic Society, and contained in your number of The British Journal of Photography for December 1st, I am wrongly reported to have said that the objection existing to slow filtration of an iron developer was that a "*proto-oxide of iron would be formed by exposure to the atmosphere.*"

The decomposition to which I alluded was the formation of a *sub-persulphate of iron*; and I still think that the simple covering of the funnel with a piece of glass is not sufficient to prevent the absorption of oxygen during the passage of the solution from the funnel to the vessel underneath. I respectfully maintain, therefore, that a developing solution containing a proto-salt of iron should be filtered as rapidly as possible, every possible precaution being adopted to prevent contact of air during the process.—I am, yours, &c. J. MARTIN.

[We had noticed the error made by our reporter, and intended to have drawn attention thereto, had not your note been received.—Ed.]

ANSWERS TO CORRESPONDENTS.

Erratum.—In the article headed "Self-acting Washing Apparatus," at page 359 in our last Number, for "axis of the lever," read "*arms* of the lever;" and for "falls on its feet," read "falls on its *seat*."

Fanny.—Omit the acetic acid, and use gallic acid alone.

A Wax-paper Man.—Thanks for your good wishes.

S. B.—We regret that we are unable to view the productions in any other light than that already expressed.

J. H. Slater.—The silver wire dipper will answer your purpose, unless it is very grossly adulterated with alloy.

Troubled Tyro.—We are quite ready to *help* you, but not to write an entire manual for your benefit only. *Hennah on the Collodion Process* is the book for your instruction.

A. M. B.—1, 2, 3. Inquire of Mr. L[illegible]d, philosophical apparatus maker, 11 and 12, Beak Street, Regent Street, London, W. See reply to "Glasguensis."—4 and 5. A few days.

R. T. D.—Johnson and Mattey, Hatton Garden. You will find the lenses that you mention perform the work you require, provided that your chemicals are properly adjusted, and the light good.

Glasguensis.—The use of Professor Way's apparatus for photographic purposes is quite out of the question at its present cost, except as a scientific experiment. Your proofs would cost more than their weight in gold.

J. B. Y.—Your note reached us only on the day when the last Number was "at press," hence it was impossible to reply to you in that. Your sketch is quite correct, except that you have drawn the *negative* too near the *condenser*. The plano-convex of 9 inches diameter will do best; place the *plano* side towards the *negative*.

W. Daniels.—1 and 2. A bi-lens camera; but you must consult our advertisements for the other information. It is not considered fair for us to name any special maker.—3. Dissolve two grains of isinglass in an ounce of water (by heat), and apply by floating or brush. Consult Mr. Wall's articles: the back numbers are to be had of the publisher.

T. J.—The orthographic lens which you indicate will answer the purpose. The stereo-view lens would be much too slow in action. The longer focus that your lens is (if large in proportion) the better result you will obtain in marginal definition for any given size. We do not know the price of Bertsch's automatic camera, or whether it is in the market.

H. H. B.—Hydrochloric acid and water, equal parts. Dissolve therein to saturation, perchloride of mercury. To use the above take a $\frac{1}{2}$ drachm to an ounce of water; pour it on the positive while still wet, and when the whitening is complete, wash thoroughly. Instead of the preceding, some operators use an aqueous solution of perchloride of mercury, to which is added a few drops of perchloride of iron.

Eleve.—1. At an *operative* chemist's, not at a druggist's.—2 and 3. Would occupy too much space to answer; *Hockin's Manual* is what you want.—4. Canson's paper is sometimes very good, but is uncertain. We prefer Hollingworth's.—5. If the streaks are in the direction of the dip, they most likely arise from too early withdrawal of the plate from the bath; if across the plate, they are from hesitation in plunging it in. The *Manual* will answer all your other queries.

O. L. (Cork).—We have been informed by Mr. Maltwood that his camera, described in our last Number, will be supplied to the public by Mr. C. Jabez Hughes, of Oxford Street, London, to whom we must refer you for particulars of cost, &c. The details of manipulation in making micro-photographs are given in papers read before the Photographic Society, 5th Nov., 1857, which may be found in our 4th Vol., p. 245, *et seq.* Mr. Cox, of Skinner Street, Snow Hill, London, has also recently published a pamphlet on the subject.

Draughtsman.—Please refer again to what we asserted, and you will find you have not quoted correctly. That the lines appear to converge *towards* a "vanishing point," when viewed as the chairman supposed, we did *not* deny. We denied that they would *appear to meet;* and so we do still. Because, if the lines be visible at all, much more will the *space between them* (which is by construction greater than the lines), be also visible. Remember, the *visibility of the lines* was a condition imposed by the chairman, not assumed by us.

B. B. H.—For printing glass transparencies we think you will find the Fothergill process all that you can desire for contact printing. For this purpose you had better employ positive collodion, as too great density is objectionable. By developing with pyrogallic and acetic acids a reddish tone is produced—with pyrogallic and citric acids a blueish tone is the result: both are objectionable; but by mixing these two developers in various proportions, several shades of warm browns to purples can be obtained, which generally do well without further toning. If, however, you have a good picture, but of a bad tone, a solution of $\frac{1}{2}$ grain of chloride of gold to the ounce of water will generally mend it. It is not safe to omit varnishing.

James Livesey.—Place your glass concave side downwards on a level table, and around the edge make a *wall* of wax, or gutta-percha, or any similar material high enough to hold a solution over the top of the curve. Dissolve nitrate of silver in distilled water, probably five or six grains to each ounce would be strong enough. Put some honey into a mortar, and add a drop or two of oil of cloves; triturate, and then add water with a little alcohol and mix up. Filter and mix with the silver solution and pour into your glass receptacle, and let it stand for twenty-four hours, when you ought to find a deposit of silver in close contact with the glass. Try a preliminary experiment with a small quantity on a common watch glass. Another plan is to coat the inside of your concave glass with iodised collodion. Fill it with nitrate of silver solution to sensitise, expose to light, and develop by pouring in a solution of photosulphate of iron acidified with nitric acid; wash and dry. Then polish the *inside* with a tuft of soft cotton.—A white opaque varnish is easily made by grinding up *flake white* with ordinary spirit varnish. Some few years back a capital article of the kind was purchaseable at the artists' colour shops, when the ladies were all making old china out of chintz and blown glass by a messy process, which they called *Potichomanie.* Perhaps if you inquire you may still find a few bottles in stock.

J. Wingrave—Thos. O.—"Con Tutto Core"—and F. F.—received with thanks, and will have due attention as soon as pressing matters permit.

Received.—J. Louch. The sketch to which you allude in your P.S. will appear in our next.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

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